
The following Motions and Documents were considered by the GFC Programs Committee at its Thursday, November 17, 2022 meeting:

Agenda Title: **Course, Minor Program, and Minor Regulation Changes**

- Agricultural, Life and Environmental Sciences
- Arts
- Education
- Kinesiology, Sport, and Recreation
- Medicine and Dentistry
- Nursing
- Rehabilitation Medicine
- Saint-Jean
- Science

CARRIED MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the attached course, minor program, and minor regulation change submissions from the Faculties of Agricultural, Life and Environmental Sciences, Arts, Education, Kinesiology, Sport, and Recreation, Medicine and Dentistry, Nursing, Rehabilitation Medicine, Saint-Jean, and Science.

FINAL Item 4

Agenda Title: **Proposed Changes to Indigenous Admissions for the BSc in Dental Hygiene and the Doctor of Dental Surgery Programs, Faculty of Medicine and Dentistry**

CARRIED MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the proposed changes to admission requirements and regulations for the Doctor of Dental Surgery and Bachelor of Science (Dental Hygiene) Programs, as proposed by the Faculty of Medicine and Dentistry and as set forth in Attachments 1-2, to take effect for Fall 2024.

FINAL Item 5

Agenda Title: **Proposed New Ministry-approved Specializations in Astrophysics, Environmental Earth Sciences, and Paleontology, Faculty of Science**

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Astrophysics as a new Ministry-approved specialization effective July 1, 2024.

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Environmental Earth Sciences as a new Ministry-approved specialization effective July 1, 2024.

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Paleontology as a new Ministry-approved specialization effective July 1, 2024.

FINAL Item 6A

Agenda Title: **Proposed Internal Suspension of all Science Specializations Programs, certain Honors Programs, and the Minor in Physical Sciences, Faculty of Science**

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the following BSc with Specialization programs for the period July 1, 2024 - June 30, 2029:

- a. Bachelor of Science with Specialization in Astrophysics
- b. Bachelor of Science with Specialization in Biochemistry
- c. Bachelor of Science with Specialization in Cell Biology
- d. Bachelor of Science with Specialization in Chemistry
- e. Bachelor of Science with Specialization in Computing Science
- f. Bachelor of Science with Specialization in Computing Science - Business Minor
- g. Bachelor of Science with Specialization in Computing Science - Software Practice
- h. Bachelor of Science with Specialization in Ecology, Evolution and Environmental Biology
- i. Bachelor of Science with Specialization in Environmental Earth Sciences
- j. Bachelor of Science with Specialization in Geology
- k. Bachelor of Science with Specialization in Geophysics
- l. Bachelor of Science with Specialization in Immunology and Infection
- m. Bachelor of Science with Specialization in Integrative Physiology
- n. Bachelor of Science with Specialization in Mathematics
- o. Bachelor of Science with Specialization in Mathematics - Computational Science
- p. Bachelor of Science with Specialization in Mathematics and Finance
- q. Bachelor of Science with Specialization in Mathematics and Economics
- r. Bachelor of Science with Specialization in Molecular, Cellular and Developmental Biology
- s. Bachelor of Science with Specialization in Paleontology
- t. Bachelor of Science with Specialization in Pharmacology
- u. Bachelor of Science with Specialization in Physics
- v. Bachelor of Science with Specialization in Planning
- w. Bachelor of Science with Specialization in Psychology
- x. Bachelor of Science with Specialization in Statistics

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the following BSc with Honors programs for the period July 1, 2024 - June 30, 2029:

- a. Bachelor of Science with Honors in Applied Mathematics - Minor in Computing Science
- b. Bachelor of Science with Honors in Applied Mathematics - Minor in Statistics
- c. Bachelor of Science with Honors in Mathematics - Minor in Computing Science
- d. Bachelor of Science with Honors in Mathematics - Minor in Statistics

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the Minor in Physical Sciences for the period July 1, 2024 - June 30, 2029.

FINAL Item 6B

Agenda Title: **Proposed New Internal Majors, Honors, Second-level Specializations, and EAS Major/Minor Name Change, Faculty of Science**

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new internal Major programs, effective July 1, 2024:

- a. Bachelor of Science, Major in Applied Mathematics
- b. Bachelor of Science, Major in Biochemistry
- c. Bachelor of Science, Major in Cell Biology
- d. Bachelor of Science, Major in Ecology, Evolution and Environmental Biology
- e. Bachelor of Science, Major in Geology
- f. Bachelor of Science, Major in Geophysics
- g. Bachelor of Science, Major in Immunology and Infection
- h. Bachelor of Science, Major in Integrative Physiology
- i. Bachelor of Science, Major in Mathematical Physics
- j. Bachelor of Science, Major in Mathematics and Economics
- k. Bachelor of Science, Major in Mathematics and Finance
- l. Bachelor of Science, Major in Molecular, Cellular and Developmental Biology
- m. Bachelor of Science, Major in Neuroscience
- n. Bachelor of Science, Major in Pharmacology
- o. Bachelor of Science, Major in Physiology
- p. Bachelor of Science, Major in Planning

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new Honors programs, effective July 1, 2024:

- a. Bachelor of Science with Honors in Biological Sciences
- b. Bachelor of Science with Honors in Computing Science - Software Practice Option
- c. Bachelor of Science with Honors in Earth Sciences
- d. Bachelor of Science with Honors in Planning

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new second-level specializations, effective July 1, 2024:

- a. Minor in Astrophysics
- b. Minor in Biochemistry
- c. Minor in Cell Biology
- d. Minor in Climate Dynamics
- e. Minor in Geophysics
- f. Minor in Pharmacology
- g. Software Practice Option

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following name changes, effective July 1, 2024:

- a. Minor in Earth and Atmospheric Sciences (to Minor in Earth Sciences)
- b. Major in Earth and Atmospheric Sciences (to Major in Earth Sciences)

FINAL Item 6C

Agenda Title: **Proposed Changes to Admission and Program Requirements related to the New BSc Degree Framework, BSc Renewal Project, Faculty of Science**

CARRIED MOTION:

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the attached changes for inclusion in the 2023-2024 University Calendar:

- a. Bachelor of Science General (UPDATED)
- b. Bachelor of Science Specialization (UPDATED)
- c. Bachelor of Science Honors (UPDATED)
- d. Bachelor of Science (Major and Honors) - Effective Fall 2024 (NEW)
 - i. Breadth from Outside the Faculty of Science Course Lists (NEW)
 - ii. Breadth from Within the Faculty of Science Course Lists (NEW)
 - iii. Lab/Field Experience Course List (NEW)
 - iv. Ecology, Evolution or Diversity List (NEW)
 - v. Genetics, Molecular Biology or Microbiology List (NEW)
 - vi. Physiology, Cell Biology or Developmental Biology List (NEW)
 - vii. EE&E Major/Honors Course Lists A - E (NEW)
- e. Faculty of Science Admission Requirements (UPDATED)
 - i. Subject Area Courses (NEW)
- f. Faculty of Science Admission Chart 7 (DELETED)
- g. Faculty of Science Admission Deadlines (UPDATED)
- h. Faculty of Science General Information (UPDATED)
- i. Faculty of Science Regulations (UPDATED)

FINAL Item 6D



**Governance Executive Summary
Action Item**

Agenda Title	Course, Minor Program, and Minor Regulation Changes <ul style="list-style-type: none"> - Agricultural, Life and Environmental Sciences - Arts - Education - Kinesiology, Sport, and Recreation - Medicine and Dentistry - Nursing - Rehabilitation Medicine - Saint-Jean - Science
---------------------	---

Motion

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the attached course and minor program change submissions from the Faculties of Agricultural, Life and Environmental Sciences, Arts, Education, Kinesiology, Sport, and Recreation, Medicine and Dentistry, Nursing, Rehabilitation Medicine, Saint-Jean, and Science.

Item

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Faculty Councils
Presenter(s)	Janice Causgrove Dunn, Vice-Provost (Programs) and Chair, GFC PC

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	To approve course and minor program changes.
Executive Summary <i>(outline the specific item – and remember your audience)</i>	<p>All routine course, minor program, and minor regulation changes that do not involve or affect other Faculties or units, and do not form part of a proposal for a new program or a substantive program change, are approved regularly by the GFC Programs Committee in an omnibus motion.</p> <p>See individual item for Faculty Council approval information.</p>
Supplementary Notes and context	<This section is for use by University Governance only to outline governance process.>

Engagement and Routing (Include meeting dates)



<p>Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity)</p> <p><For information on the protocol see the Governance Resources section Student Participation Protocol></p>	<p><u><i>Those who are actively participating:</i></u></p> <ul style="list-style-type: none"> • Vice-Provost (Programs) and Chair, GFC Programs Committee • Faculty Councils • Representatives of the Office of the Registrar <p><u><i>Those who have been consulted:</i></u></p> <ul style="list-style-type: none"> • Program Support Team, Undergraduate and Non-Credit • Graduate Program Support Team
<p>Approval Route (Governance) (including meeting dates)</p>	<p>GFC Programs Committee, November 17, 2022</p>

Strategic Alignment

<p>Alignment with <i>For the Public Good</i></p>	<p>Objective 21</p>
<p>Legislative Compliance and jurisdiction</p>	<p><i>Post-Secondary Learning Act (PSLA)</i> GFC Programs Committee (PC) Terms of Reference</p>

Attachments:

1. Agricultural, Life and Environmental Sciences
2. Arts
3. Education
4. Kinesiology, Sport, and Recreation
5. Medicine and Dentistry
6. Nursing
7. Rehabilitation Medicine
8. Saint-Jean
9. Science

Prepared by: Heather Richholt, Associate Secretary to GFC, heather.richholt@ualberta.ca



Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (AFNS)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

Proposed by: C. Carlyle (Plant Biosystems Division Director) and G. Chen (Instructor)
 Every year, 1-3 graduate students take PL SC 345 as the independent study course AFNS 500. They attend the lectures and complete additional course components to bring the course to graduate level. Specifically, undergraduate students need to write a 5-page review on a given topic and then give a 12-minute presentation, whereas graduate students need to write a 10-page review with a 24-minute presentation. The instructor evaluates the overview and presentation from a junior graduate student level instead of undergraduate level. This course will allow these students to register directly for the graduate level version of the course, cut down on paperwork and processing of independent study forms, and enhance the availability of graduate-level course offerings in AFNS. This approach is modeled by other courses offered in AFNS.

Current	Proposed
New Course	<p>AFNS 545 - Plants for Bioproducts Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Agric, Life & Environ Sciences Department Agric, Food & Nutr Sci Typically Offered second term</p> <p>Description This course will enable students to get a comprehensive understanding of the production and use of plant bioproducts. By the end, students will be able to properly outline the most recent research, development and production of certain plant bioproducts in written and oral presentations. The following contexts will be given special consideration in lectures: carbon cycle and human impacts, strategies for reducing our environmental footprint, and production and application of plant-based industrial materials. Students will also prepare a written overview on a given topic and then give an oral presentation about this topic in class. Not to be taken if credit received for PL SC 345. Prerequisite: consent of instructor.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (AFNS)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

Proposed by: C. Carlyle (Plant Biosystems Division Director) and S. Strelkov (Instructor)
 Every year, 3-6 graduate students take PL SC 380 as the independent study course AFNS 500. They attend the lectures and labs, and complete additional course components to bring the course to a graduate level; these additional components include a research paper on a topic chosen in consultation with the instructor, and an oral presentation based on the research paper. This course will allow these students to register directly for the graduate level version of the course, cut down on paperwork and processing of independent study forms, and enhance the availability of graduate-level course offerings in AFNS. This approach is modeled by other courses offered in AFNS.

<p>Current</p> <p>New Course</p>	<p>Proposed</p> <p>AFNS 583 - Principles of Plant Pathology Course Career Graduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Agric, Life & Environ Sciences Department Agric, Food & Nutr Sci Typically Offered first term</p> <p>Description An advanced course on plant diseases; the nature of nonparasitic and parasitic causal agents such as air pollutants, temperature, viruses, bacteria, fungi, higher plants and nematodes; principles involved in disease prevention and control. Not to be taken if credit received for PL SC 380. Prerequisite: consent of the instructor.</p>
--	---

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (AFNS)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

Proposed by: R. Uwiera (Animal Science Division Director) and C. Li (Instructor)

With the development of genomic research in animals and plants, new genomic data analysis methods and tools need to be introduced to students. The course description (AFNS 585) requires revisions accordingly. Currently, the course has a lab session of 3 hours per week. However, the lab session was not actually offered in the past terms. Instead, the so-called lab session was integrated with the lecture session to introduce and demonstrate software/tools that were used in genomic data analyses, which has shown its effectiveness. Therefore, the proposed change from 3-0-3 to 3-0-0 along with the proposed changes in the course description would provide clearer information on how the course is offered.

Current	Proposed
<p>AFNS 585 - Advanced Quantitative Genomics Course Career Graduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Agric, Life & Environ Sciences Department Agric, Food & Nutr Sci Typically Offered second term</p> <p>Description Genetics and analysis of quantitative traits in farm animals and plants. Detecting, locating and measuring effects of quantitative traits loci (QTL). Recent developments in QTL mapping and discovery. The laboratory sessions include commonly used software for analyzing data from breeding and genomics experiments. Normally offered in alternate years. Prerequisite: consent of instructor.</p>	<p>AFNS 585 - Advanced Quantitative Genomics Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Agric, Life & Environ Sciences Department Agric, Food & Nutr Sci Typically Offered second term</p> <p>Description Genomics and analysis of quantitative traits in farm animals and plants. Detecting, locating and measuring effects of quantitative traits loci (QTL). Recent developments in QTL mapping and gene discovery and genomic selection. Lectures will be followed by active discussion of selected readings and demonstration of commonly used software for analyzing genomic data. Normally offered in alternate years. Prerequisite: consent of instructor.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

Proposed by: N. Erbilgin (REN R Department Chair)

Due to course number change from 441 to 341. Note: remove the additional "be" and add a space after "Calendar.", to manage editorial errors.

Current	Proposed
<p>REN R 541 - Advanced Soil Formation, Classification and Landscape Processes Course Career Graduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered first term</p> <p>Description Soil classification with a focus on soil genesis as influenced by soil forming factors and processes. Spatial variability of soil types within landscapes in association with vegetation, parent geological materials, hillslope hydrology and microclimate. Soils as components of ecosystems and their relation to environmental issues. Distribution of soils in Canada. Field trips. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Not to be be taken if credit received for REN R 441 or REN R 741.</p>	<p>REN R 541 - Advanced Soil Formation, Classification and Landscape Processes Course Career Graduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered first term</p> <p>Description Soil classification with a focus on soil genesis as influenced by soil forming factors and processes. Spatial variability of soil types within landscapes in association with vegetation, parent geological materials, hillslope hydrology and microclimate. Soils as components of ecosystems and their relation to environmental issues. Distribution of soils in Canada. Field trips. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Not to be taken if credit received for REN R 341, REN R 441 or REN R 741.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

Proposed by: N. Erbilgin (REN R Department Chair) and D. Haughland (Instructor).
 This course has been offered as REN R 501 for some years. We propose to give it a course number and name to make it more visible to students and increase enrollment.

Current	Proposed
New Course	<p>REN R 524 - Lichenology Course Career Graduate Units 3 Approved Hours 1-0-2 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered second term</p> <p>Description An introduction to the identification, biology, and ecology of lichens in Alberta, which comprise a diverse and under-studied component of Alberta's flora. An emphasis on current research questions and methods. Combined lecture and laboratory, including microscopy, chemical testing, and interpreting morphology. Term project decided upon by students, and may include original research in taxonomy, ecology or lichen biomonitoring. Students learn to identify more than 80 species from across Alberta. Normally offered in alternate years. Not to be taken if credit received for REN R 424.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

Proposed by: N. Erbilgin (REN R Department Chair) and G. Hernandez Ramirez (Instructor)
 This course will replace REN R 745. The course is assigned at a 500 level, so that thesis-based graduate students are eligible to take it. The title and syllabus reflects that this is a more advanced course, including unique contents and differential evaluation components.

<p>Current</p> <p>New Course</p>	<p>Proposed</p> <p>REN R 545 - Advanced Plant Nutrition Course Career Graduate Units 3 Approved Hours 3-0-1 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered second term</p> <p>Description Essential plant nutrients; driving factors of nutrient bioavailability and cycling; plant uptake and utilization of nutrients; evaluation of soil fertility in terms of nutrient deficiencies and responses; management of soil fertility challenges from both productivity and environmental perspectives; assessment of options of nutrient sources. Lab exercises may include field trips. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Not to be taken if credit received for REN R 445 or REN R 745. Prerequisite: consent of instructor.</p>
---	---

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

*Proposed by: N. Erbilgin (REN R Department Chair) and R. Froese (Instructor).
 Rationale for Change: This course will strengthen the forestry curriculum in this contemporary and important area.*

Current	Proposed
New Course	<p>REN R 548 - Forest Growth and Yield Course Career Graduate Units 3 Approved Hours 3-1-0 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered second term</p> <p>Description Measurement, modelling, and forecasting the future development of attributes of trees and forest stands. Tree taper, volume, and biomass estimation, recruitment, growth, yield, and survival functions, site quality estimation, and simulation modelling including linkages to forest inventory, applications of remote sensing, and reference data programs for monitoring and model development. Not to be taken if credit received for REN R 448. Prerequisite: consent of instructor.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

*Proposed by: N. Erbilgin (REN R Department Chair) and F. He (Instructor).
Term correction; this is a combined course with REN R 469 scheduled in the second term.*

Current	Proposed
<p>REN R 569 - Biodiversity Analysis Course Career Graduate Units 3 Approved Hours 3-0-2 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered first term</p> <p>Description Introduction to the theory and application of biodiversity with emphasis on quantitative analysis of biodiversity data. The course covers the concepts of biodiversity (genetic, species and ecosystem), dynamics of species populations, diversity measurements, estimation of species richness, synthetic patterns of species diversity (species-abundance, species-area, distribution-abundance, local-regional, beta diversity, richness-productivity, etc.), theories of biodiversity maintenance, species distribution models, and methods and models of biodiversity conservation including estimating species extinction risk and viable population size. Laboratory session involves using statistical software R for analyzing various real diversity data. REN R 569 is built on REN R 469 with a focus on problem solving skill, individual projects and advanced R programming. Not to be taken if credit received for REN R 469.</p>	<p>REN R 569 - Biodiversity Analysis Course Career Graduate Units 3 Approved Hours 3-0-2 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered second term</p> <p>Description Introduction to the theory and application of biodiversity with emphasis on quantitative analysis of biodiversity data. The course covers the concepts of biodiversity (genetic, species and ecosystem), dynamics of species populations, diversity measurements, estimation of species richness, synthetic patterns of species diversity (species-abundance, species-area, distribution-abundance, local-regional, beta diversity, richness-productivity, etc.), theories of biodiversity maintenance, species distribution models, and methods and models of biodiversity conservation including estimating species extinction risk and viable population size. Laboratory session involves using statistical software R for analyzing various real diversity data. REN R 569 is built on REN R 469 with a focus on problem solving skills, individual projects and advanced R programming. Not to be taken if credit received for REN R 469.</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

Calendar Change Request Form for Course Changes

Faculty (& Department or Academic Unit):	ALES (REN R)
Contact Person:	Leluo Guan (lguan@ualberta.ca)
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

*Proposed by: N. Erbilgin (REN R Department Chair) and G. Hernandez Ramirez (Instructor)
 This course is being replaced by REN R 545. The title and syllabus reflects that this is a more advanced course.*

Current	Proposed
<p>REN R 745 – Soil Fertility Course Career Graduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Agric, Life & Environ Sciences Department Renewable Resources Typically Offered second term</p> <p>Description Essential plant nutrients; driving factors of nutrient bioavailability and cycling; plant uptake and utilization of nutrients; evaluation of soil fertility in terms of nutrient deficiencies and responses; management of soil fertility challenges from both productivity and environmental perspectives; assessing options of nutrient sources. Lab exercises may include field trips. May require payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Not to be taken if credit received for REN R 445.</p>	<p>Delete Course</p>

Reviewed/Approved by:

Approved by ALES Faculty Council; October 17, 2022

This package contains: [Graduate - Courses](#)

Faculty approval date:

AAC Date: April 12,2022

Page	Department or Unit	What is Changing
2	Economics	ECON 515, 593
4	History, Classics and Religion	CLASS 601, 602
5	Music	MUSIC 646
6	Music	MUSIC 746
7	Media and Technology Studies	DH 900

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Arts / Department of Economics
Contact Person:	Chelsi Hudson: econug@ualberta.ca
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
For which term will this change take effect?	Fall 2022

Rationale

New Courses

Course Template

	<p><u>ECON 515</u></p> <p><u>Economic Persistence</u></p> <p><u>Course Career Graduate</u></p> <p><u>Units 3</u></p> <p><u>Approved Hours 3-0-0</u></p> <p><u>Fee index 6</u></p> <p><u>Faculty Arts</u></p> <p><u>Department Economics</u></p> <p><u>Typically Offered either term</u></p> <p><u>Description</u> A survey and critical analysis of long-lasting and multi-generational economic outcomes with special attention given to empirical methods. Topics include intergenerational mobility, comparative economic development, economic geography, historical record linking, and spatial autocorrelation.</p>
--	--

	<p>ECON 593</p> <p>Prediction and Machine Learning for Economics</p> <p>Course Career Graduate</p> <p>Units 3</p> <p>Approved Hours 3-0-0</p> <p>Fee index 6</p> <p>Faculty Arts</p> <p>Department Economics</p> <p>Typically Offered either term</p> <p>Description Statistical methods for modeling and forecasting economic data. Topics may include data wrangling and exploration, visualization, cross-validation, regression models, machine learning methods, classification, predictive analytics, and forecasting with time series data.</p>
--	--

Reviewed/Approved by:

Approved by Economics Department Council: 2022-03-21 .
Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: History, Classics, and Religion

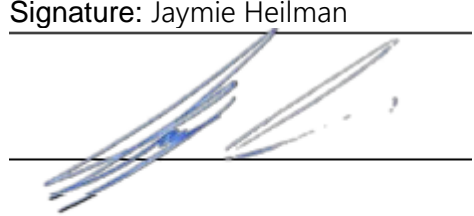
Change: Graduate Course

Rationale: The name of the current course does not cover the content of the course which is focused on teaching archaeological field techniques in a practical setting. The new title better describes the course content and purpose.

<https://apps.ualberta.ca/catalogue/course/class/601>

Calendar Copy:

Current: Strike through and highlight deletions	Proposed: <u>Underline and highlight</u> additions
<p>CLASS 601 - Studies in Classical Archaeology I ★ 3 (fi 6)(EITHER, 0-3S-0) Faculty of Arts</p> <p>Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p> <p>CLASS 602 - Studies in Classical Archaeology II ★ 3 (fi 6)(EITHER, 0-3S-0) Faculty of Arts</p> <p>Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p>	<p>CLASS 601 – <u>Field Techniques in Classical Archaeology I</u> ★ 3 (fi 6)(EITHER, 0-3S-0) Faculty of Arts</p> <p>Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p> <p>CLASS 602 – <u>Field Techniques in Classical Archaeology II</u> ★ 3 (fi 6)(EITHER, 0-3S-0) Faculty of Arts</p> <p>Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p>

Department Contact: Prof. F. Pownall	Department Council Approval Date: March 11, 2022
Chair or Designate: Jaymie Heilman	<p>Signature: Jaymie Heilman</p> 

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Music
Change: Graduate Course

Rationale: The word “Workshop” is associated with a brief meeting period, small groups, or an area where crafts people work. The course enrolment numbers have grown significantly and the class regularly presents productions and concerts. This name change would better reflect the course and its content. Members of the voice area consulted: John Tessier, Shannon Hiebert, Miriam Khalil and Sherry Steele. Please note the course is offered with three numbers, MUS 446, 646, 746. Each course number requires the name change.


<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11383>


Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
[...] MUSIC 646 - Opera Workshop [...]	[...] MUSIC 646 - <u>University Opera Theatre</u> [...]

Department Contact: John Tessier	Department Council Approval Date:
Chair or Designate: Mark Hannesson	Signature:

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Music

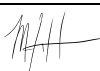
Change: Graduate Minor Program Change

Rationale: The word “Workshop” is associated with a brief meeting period, small groups, or an area where crafts people work. The course enrolment numbers have grown significantly and the class regularly presents productions and concerts. This name change would better reflect the course and its content. Members of the voice area consulted: John Tessier, Shannon Hiebert, Miriam Khalil and Sherry Steele. Please note the course is offered with three numbers, MUS 446, 646, 746. Each course number requires the name change.

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11383>

Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
<p>[...] MUSIC 746 - Opera Workshop</p>	<p>[...] MUSIC 746 - <u>University Opera Theatre</u></p>

Department Contact: John Tessier	Department Council Approval Date: Apr 8, 2022
Chair or Designate: Mark Hannesson	Signature: 

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Media and Technology Studies
Change: Graduate Course

Rationale: DH 900 is a required course in the Masters of Arts (Digital Humanities) Course-Based Program. At minimum students are required to take 6 units in two separate terms. However, there are instances where International Students may require additional credits to maintain their full-time student's status. For that reason flexibility of credits can be made available by scheduling several sections/term that offer variable credits and fee index. Students pay for the program as a whole so tuition would not be affected. The program is being revised to have the 36 required units be a minimum and not a total to allow for additional credits from DH 900 in certain cases.

https://calendar.ualberta.ca/search_advanced.php?cur_cat_oid=36&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=33&filter%5Bkeyword%5D=dh+900&filter%5Bexact_match%5D=1

Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
<p>DH 900 - Digital Humanities Practicum Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Arts Department Media and Technology Studies Typically Offered either term</p> <p>Description The Digital Humanities practicum is the capstone exercise by students in the course-based MA in Digital Humanities. It provides students with hands-on experience working on a large-scale digital project. Normally, this project will be led by faculty members in DH; permission to participate in projects outside of the program or the university will be evaluated on a case-by-case basis.</p>	<p>DH 900 - Digital Humanities Practicum Course Career Graduate Units <u>3 - 9</u> Approved Hours <u>0-3-0</u> Fee index <u>Variable</u> Faculty Arts Department Media and Technology Studies Typically Offered either term</p> <p>Description The Digital Humanities practicum is the capstone exercise by students in the course-based MA in Digital Humanities. It provides students with hands-on experience working on a large-scale digital project. Normally, this project will be led by faculty members in DH; permission to participate in projects outside of the program or the university will be evaluated on a case-by-case basis.</p>

Department Contact: Nicola DiNicola	Department Council Approval Date: 4.8.22
Chair or Designate: Nat Hurley	Signature:

This package contains: **Graduate - Substantive Program Changes**

Faculty approval date:

AAC Date: April 12,2022	AEC: May 5, 2022	AFC: May 19, 2022
-------------------------	------------------	-------------------


Page	Department or Unit	What is Changing
3	Media And Technology Studies	Master of Arts (Digital Humanities)

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22



Department:

Duplicate Page Removed from Package

Change:

<p>Rationale: (why is this change being proposed and who was consulted?)</p> <p><i>Item removed from package</i></p>


Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
	

Chair or Designate:	Signature:

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: **Media and Technology Studies**

Duplicate Page Removed from Package

Change: **Graduate Major Program Change**

Rationale:

1) Thesis-Based – Relocating the information for the required 9 unit out of the general information section and under the “required courses” header.

2) Course Based

2.1. Relocating the information for the required 9 unit out of the general information section and under the “required courses” header.

2.2 Adjusted programs maximum credits and enrolment information as DH 900 is changing to a variable credit course. Students will still be required to take DH 900 twice in different terms. A note has been added to prevent a student from meeting the unit requirement in a single term. However, there are cases where a student may require additional credits above the required 36 to maintain their full-time student status. Changing DH 900 to a variable credit course will allow for different sections to be offered with different credits to allow students to maintain their full-time status. Changing the program from required 36 units to a minimum of 36 units will allow students to enroll without more administrative assistance or permissions to take credits “extra to degree”.

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42610&hl=%22DH+900%22&returnto=search

Calendar Copy:

Current: Strike through and highlight deletions	Proposed: <u>Underline and highlight</u> additions
<p>Master of Arts (Digital Humanities)</p> <p>Program Requirements</p> <p>Thesis-Based Program</p> <hr/> <p>The thesis-based MA in Digital Humanities program consists of 27 units plus a thesis; of these 18 units are in Digital Humanities, and 9 units are in courses approved by the students’ specialization department (if applicable), or are open for students in the Individualized program. (moved down)</p> <p>Required courses (18 units): DH 500 - Survey of Digital Humanities DH 510 - Topics in Digital Theory and Culture Any two of DH 520 - Topics in Technical Concepts and Approaches Any two of DH 530 - Topics in Building in Context</p> <p>Note: If there is a specialization it is normally expected that a representative of both the Digital Humanities program and the participating department will sit on the thesis supervisory committee.</p>	<p>Master of Arts (Digital Humanities)</p> <p>Program Requirements</p> <p>Thesis-Based Program</p> <hr/> <p>The thesis-based MA in Digital Humanities program consists of 27 units plus a thesis.</p> <p>Required courses (27 units): DH 500 - Survey of Digital Humanities DH 510 - Topics in Digital Theory and Culture Any two of DH 520 - Topics in Technical Concepts and Approaches Any two of DH 530 - Topics in Building in Context 9 units <u>in courses approved by the students’ specialization department (if applicable), or are open for students in the Individualized program.</u></p> <p>Note: If there is a specialization it is normally expected that a representative of both the Digital Humanities program and the participating department will sit on the thesis supervisory committee.</p> <p>Length of the Program <u>The time required to complete the thesis-based MA may vary according to the previous training of the</u></p>

applicant and the nature of research undertaken; however, the program is designed to be completed within 24 months. (Moved up)

Duplicate Page Removed from Package
Course-Based Program

Course-Based Program

The course-based MA in Digital Humanities consists of 30 units of course work plus 6 units of practicum for a total of 36 units. Of these 27 units are in Digital Humanities, and 9 units are in courses approved by the students' specialization department (if applicable), or are open for students in the Individualized program. (Move)

Required courses (27 units):

- DH 500 - Survey of Digital Humanities
- Any two of**
- DH 510 - Topics in Digital Theory and Culture
- Any two of**
- DH 520 - Topics in Technical Concepts and Approaches
- Any two of**
- DH 530 - Topics in Building in Context

- Any two of**
- DH 900 - Digital Humanities Practicum

Length of the Program

The time required to complete the thesis-based MA may vary according to the previous training of the applicant and the nature of research undertaken; however, the program is designed to be completed within 24 months. (Move up)

The course-based program is designed to be completed within 24 months.

The course-based MA in Digital Humanities consists of 30 units of course work plus at least 6 units of practicum for a total minimum of 36 units.

Required courses (27 units):

- DH 500 - Survey of Digital Humanities
- Any two of**
- DH 510 - Topics in Digital Theory and Culture
- Any two of**
- DH 520 - Topics in Technical Concepts and Approaches
- Any two of**
- DH 530 - Topics in Building in Context

9 Units
in courses approved by the students' specialization department (if applicable), or are open for students in the Individualized program.

Practicum

- 6-9 Units of**
- DH 900 - Digital Humanities Practicum
- Note: total units cannot be acquired in a single term**

Length of the Program

The course-based program is designed to be completed within 24 months.

Department Contact: Nicola DiNicola	Department Council Approval Date: 4.8.22
Chair or Designate: Nat Hurley	Signature:

This package contains: [Undergraduate - Courses](#)

Faculty approval date:

AAC Date: April 12,2022

Page	Department or Unit	What is Changing
2	Economics	ECON 252, 389, 415, 455, 472, 493
6	Economics	ECON 269, 467
7	History Classics and Religion	CLASS 475
8	History Classics and Religion	HIST 350
9	Media and Technology Studies	MST 200, 310, 400, 399
10	Music	MUSIC 446
11	Psychology	PSYCH 105

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Arts / Department of Economics
Contact Person:	Chelsi Hudson: econug@ualberta.ca
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
For which term will this change take effect?	Fall 2022

Rationale

- New Courses
- 389: Following students' feedback, the wording of the title and description have been changed to clarify the course content.
- 472/493: description updated to reflect changes in course content. Specifically, ECON 472 examines competition policies in several countries and covers natural monopolies. For ECON 493, the changes reflect the inclusion of machine learning methodologies in the course content.

Course Template

Current	Proposed
	<p><u>ECON 252</u></p> <p><u>Economics of Religion</u></p> <p><u>Course Career Undergraduate</u></p> <p><u>Units 3</u></p> <p><u>Approved Hours 3-0-0</u></p> <p><u>Fee index 6</u></p> <p><u>Faculty Arts</u></p> <p><u>Department Economics</u></p> <p><u>Typically Offered either term</u></p> <p><u>Description</u> Critical evaluation of the rational choice model of Economics used to explain religious phenomena. Investigation of the demand and supply factors that explain extremism, the distinction between competition and regulation towards curbing religious cults, the role of club theory in explaining rigid rituals, and the impact of religion on economic development. Prerequisite ECON 101.</p>

ECON 389**Macroeconomic Measurement****Course Career** Undergraduate**Units** 3**Approved Hours** 3-0-0**Fee index** 6**Faculty** Arts**Department** Economics**Typically Offered** either term**Description**

Analysis of various macroeconomic theories with emphasis on data analysis and measurement at the aggregate and disaggregate levels. Topics include measurement of economic growth, unemployment, income inequality, institutions, trade, human capital, and firm size, both across and within countries. Prerequisites: ECON 109, ECON 282 and 299 or equivalent.

ECON 389**Analyzing Macroeconomic Data****Course Career** Undergraduate**Units** 3**Approved Hours** 3-0-0**Fee index** 6**Faculty** Arts**Department** Economics**Typically Offered** either term**Description**

Accessing publicly available macroeconomic data for Canada, the U.S. and many other countries; adapting, visualizing, and communicating macroeconomic statistics through simple plots and tables; organizing, managing and calculating macro statistics; using intuitive models to make sense of the data. Prerequisites: ECON 109, ECON 282 and 299 or equivalent.

ECON 415**Economic Persistence****Course Career** Undergraduate**Units** 3**Approved Hours** 3-0-0**Fee index** 6**Faculty** Arts**Department** Economics**Typically Offered** either term**Description**

A survey and critical analysis of long-lasting and multi-generational economic outcomes. Topics include: intergenerational mobility, comparative economic development, and economic geography. Case studies will highlight issues ranging from the perpetuation of gender roles to the enduring consequences of slavery, forced labour, and colonial economic policy. Prerequisites: ECON 109, ECON 281 and 299 or equivalent.

ECON 472

Market Power: Theory and Policy

Course Career Undergraduate
Units 3
Approved Hours 3-0-0
Fee index 6
Faculty Arts
Department Economics
Typically Offered either term

Description

Market definition and measurement of market power. Canadian competition policy, including merger, predation, abuse of dominance, price discrimination, tie-in sales, exclusive dealing, resale price maintenance, collusion and bid rigging. Prerequisites: ECON 109 and ECON 384.

ECON 455

Cost Benefit Analysis in Economics

Course Career Undergraduate
Units 3
Approved Hours 3-0-0
Fee index 6
Faculty Arts
Department Economics
Typically Offered either term

Description

Public sector investments (and policies) can create value or destroy value—the focus of this course is on the body of methods to determine which, covering both theory and practice. Examples may include transportation, environment, health care, and others. Topics include microeconomic foundations, discount rates, and valuation of non-market goods. Prerequisites: ECON 109, ECON 281, and MATH 156 or equivalent.

ECON 472

Market Power: Theory and Policy

Course Career Undergraduate
Units 3
Approved Hours 3-0-0
Fee index 6
Faculty Arts
Department Economics
Typically Offered either term

Description

Market definition and measurement of market power. Competition policy, including mergers, predation, abuse of dominance, price discrimination, tie-in sales, exclusive dealing, resale price maintenance, collusion and bid rigging. Regulation of natural monopolies. Prerequisites: ECON 109 and ECON 384.

<p>ECON 493</p> <p>Economic Forecasting</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Arts Department Economics Typically Offered either term</p> <p>Description Statistical methods for modeling and forecasting trends, seasonal, and cyclical components; ARMA models; regression models; forecast evaluation; and forecasting in the presence of unit roots. Prerequisites: ECON 109 and ECON 399.</p>	<p>ECON 493</p> <p>Economic Forecasting</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Arts Department Economics Typically Offered either term</p> <p>Description Methods for modeling and forecasting economic data. Topics may include regression models, cross-validation, machine learning methods, classification, predictive analytics, and forecasting with time series data. Prerequisites: ECON 109 and 399 or equivalent.</p>
---	---

Reviewed/Approved by:

<p>Approved by Economics Department Council: 2022-03-21</p>
<p>ECON 252: Consulted with History, Classics, and Religion (to be offered as a cross-listed course)</p>

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Economics
Change: Undergraduate Course

Rationale: 467: Additional prerequisites not necessary with current iteration of course and it prohibits enrollment. 269: Overlap between two courses mean they should be taken in sequence if both are taken.

https://calendar.ualberta.ca/content.php?filter%5B27%5D=ECON&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=36&expand=&navoid=11383&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter

Calendar Copy:

Current: Strike through and highlight deletions	Proposed: <u>Underline and highlight</u> additions
<p>ECON 269 - Economics of the Environment ★3 (fi 6) (either term, 3-0-0) Economic growth and the deterioration of the environment; types, causes, theory, policy, and measurement, and current Canadian environmental topics. Prerequisite: ECON 101 or equivalent. Students may not receive credit for both ECON 269 and BUEC 464.</p> <p>ECON 467 - Environmental and Natural Resource Policy ★3 (fi 6) (either term, 3-0-0) Environmental and natural resource law; domestic and global policy issues related to renewable and non-renewable resources. Prerequisites: ECON 109, ECON 281, and MATH 154 or equivalent, and one of ECON 269, ECON 365, ECON 366, or AREC 365. Not open to students with credit in ECON 466 or ENCS 473.</p>	<p>ECON 269 - Economics of the Environment ★3 (fi 6) (either term, 3-0-0) Economic growth and the deterioration of the environment; types, causes, theory, policy, and measurement, and current Canadian environmental topics. Prerequisite: ECON 101 or equivalent. Students may not receive credit for both ECON 269 and BUEC 464. <u>Not open to students with credit or enrolled in ECON 467.</u></p> <p>ECON 467 - Environmental and Natural Resource Policy ★3 (fi 6) (either term, 3-0-0) Environmental and natural resource law; domestic and global policy issues related to renewable and non-renewable resources. Prerequisites: ECON 109, ECON 281, and MATH 154 or equivalent. Not open to students with credit in ECON 466 or ENCS 473.</p>

Department Contact: Chelsi Hudson	Department Council Approval Date: Sept 22, 2021
Chair or Designate: Rick Szostak	Signature: <i>Rick Szostak</i>

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: **History, Classics, and Religion**

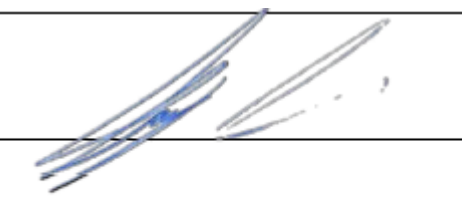
Change: **Undergraduate Course**

Rationale: The name of the current course, CLASS 475, is not correct; it is not in line with its 'twin course' CLASS 476

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=20&coid=174191

Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
<p>CLASS 475 - Techniques of Classical Field Archaeology</p> <p>★ 3-6 (variable) (variable, 0-10L-0) The techniques of survey, excavation and recording in Classical Archaeology. Prerequisites: Students must be either Classics majors or in a Classics graduate program. Note: Offered only for fieldwork in the archaeology of the Greek and Roman world and restricted to those participating in a fieldwork program sponsored by the Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.</p>	<p>CLASS 475 – <u>Field Techniques in Classical Archaeology</u></p> <p>★ 3-6 (variable) (variable, 0-10L-0) The techniques of survey, excavation and recording in Classical Archaeology. Prerequisites: Students must be either Classics majors or in a Classics graduate program. Note: Offered only for fieldwork in the archaeology of the Greek and Roman world and restricted to those participating in a fieldwork program sponsored by the Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.</p>

Department Contact: Prof. F. Pownall	Department Council Approval Date: March 11, 2022
Chair or Designate: Jaymie Heilman	Signature: Jaymie Heilman 

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: **History, Classics and Religion**

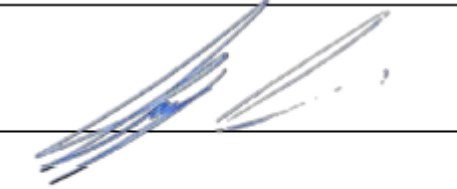
Change: **Undergraduate Course**

Rationale: This proposed course satisfies a need for student opportunities to study African slavery, the slave trade out of Africa, and international efforts at abolition. It provides a 300-level course bridging survey courses on Africa (HIST 246 and HIST 247), and supporting course content in a HIST 446 topics course on Human Trafficking and a HIST 695 graduate course on African Slavery.

https://calendar.ualberta.ca/search_advanced.php?cur_cat_oid=36&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=33&filter%5Bkeyword%5D=HIST+359&filter%5Bexact_match%5D=1

Calendar Copy:

Current: Strike through and highlight deletions	Proposed: <u>Underline and highlight</u> additions
	<p><u>HIST 350: Slavery and Abolition in Africa</u> <u>★ 3 (fi 6) (either term, 3-0-0)</u></p> <p><u>Explores slave trading out of Africa, domestic slavery within it, and European policies that were used to justify conquering and colonizing the continent. Course materials may include primary documents and images, slave narratives, historical fiction, and videos.</u></p>

Department Contact: Jane Samson	Department Council Approval Date: March 11, 2022
Chair or Designate: Jaymie Heilman	Signature: Jaymie Heilman 

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: **Media and Technology Studies**

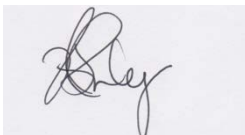
Change: **Undergraduate Course**

Rationale: The Media Studies Curriculum Committee met to determine whether course titles and prerequisites were working or needed to be changed now that most of the Media Studies courses have been taught at least once. Together, we decided that MST310 course title would be clearer if it was called The Political Economy of Media. The instructor for MST200 felt that students who had not yet completed MST100 were unprepared for MST200, so we decided to change MST from a corequisite to a prerequisite. For MST400, we wanted to make sure that it would be taken after all the other MST core courses since it is meant to be a capstone, so we added additional prerequisites. We also wanted to introduce some dedicated MST electives under the heading of MST 399 - Special Topics in the hopes of trying out some 300-level courses that may eventually be given their own course number.

https://calendar.ualberta.ca/content.php?filter%5B27%5D=MST&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=34&expand=&navoid=10323&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter

Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
<p>MST 200 – Media Theory ★ 3 (fi 6) (either term, 3-0-0) A genealogy of advanced Media Studies theories and approaches in their historical contexts. <u>Corequisite:</u> MST 100.</p> <p>MST 310 - Media Professions, Institutions and Ethics ★ 3 (fi 6) (either term, 3-0-0) Theoretical and ethical issues surrounding the political economy of media, democracy, censorship, and freedom of expression, regulation and control, privacy, surveillance, and sousveillance. Prerequisite: MST 100.</p> <p>MST 400 - Media Portfolio ★ 3 (fi 6) (either term, 0-3s-0) In this capstone course, students will produce individually or collaboratively designed and executed analytic or creative projects. <u>Prerequisite: *3 in MST at the 300 level or consent of the Program Administrator.</u></p> <p>NEW</p>	<p>MST 200 – Media Theory ★ 3 (fi 6) (either term, 3-0-0) A genealogy of advanced Media Studies theories and approaches in their historical contexts. <u>Prerequisite:</u> MST 100.</p> <p>MST 310 – <u>The Political Economy of Media</u> ★ 3 (fi 6) (either term, 3-0-0) Theoretical and ethical issues surrounding the political economy of media, democracy, censorship, and freedom of expression, regulation and control, privacy, surveillance, and sousveillance. Prerequisite: MST 100.</p> <p>MST 400 – Media Portfolio ★ 3 (fi 6) (either term, 0-3s-0) In this capstone course, students will produce individually or collaboratively designed and executed analytic or creative projects. <u>Prerequisites: MST 100, 200, 210, 300 and 310 or consent of the Program Administrator.</u></p> <p><u>MST 399 - Special Topics in Media Studies</u> ★ 3 (fi 6) (either term, 0-3s-0) <u>Prerequisite: MST100 or consent of the Program Administrator.</u></p>

Department Contact: Jaimie Baron	Department Council Approval Date:
Chair or Designate: Nat Hurley	 Signature:

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Music

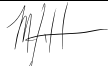
Change: Undergraduate Minor Program Change

Rationale: The word “Workshop” is associated with a brief meeting period, small groups, or an area where crafts people work. The course enrolment numbers have grown significantly and the class regularly presents productions and concerts. This name change would better reflect the course and its content. Members of the voice area consulted: John Tessier, Shannon Hiebert, Miriam Khalil and Sherry Steele. Please note the course is offered with three numbers, MUS 446, 646, 746. Each course number requires the name change.

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11383>

Calendar Copy:

Current: <u>Strike through and highlight</u> deletions	Proposed: <u>Underline and highlight</u> additions
<p>MUSIC 446 - Opera Workshop [...]</p>	<p>MUSIC 446 - <u>University Opera Theatre</u> [...]</p>

Department Contact: John Tessier	Department Council Approval Date: Apr 8, 2022
Chair or Designate: Mark Hannesson	Signature: 

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: **Psychology**

Change: **Undergraduate Course**

Rationale: Arts would like to use the same note as Science has on their PSYCH 104 course for consistency. The notes are the same in BearTracks but not in the calendar.

https://calendar.ualberta.ca/search_advanced.php?cur_cat_oid=36&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=33&filter%5Bkeyword%5D=psych&filter%5Bexact_match%5D=1

Calendar Copy:

Current: Strike through and highlight deletions	Proposed: <u>Underline and highlight</u> additions
<p>PSYCH 105 - Individual and Social Behavior Course Career Undergraduate Units 3 Approved Hours 3-0-1/4 Fee index 6 Faculty Arts Department Psychology Typically Offered either term</p> <p>Description Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be reviewed. Fulfillment of the 1/4 laboratory credit typically entails serving as a research participant but can be fulfilled through the completion of alternative assignments. [Faculty of Arts]</p>	<p>PSYCH 105 - Individual and Social Behavior Course Career Undergraduate Units 3 Approved Hours 3-0-1/4 Fee index 6 Faculty Arts Department Psychology Typically Offered either term</p> <p>Description Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be reviewed. Fulfillment of the 1/4 laboratory credit typically entails serving as a research participant but can be fulfilled through the completion of alternative assignments. <u>Note: PSYCH 104 and 105 can be taken in either term, but not in the same term.</u> [Faculty of Arts]</p>

Department Contact: K. Berrisford	Department Council Approval Date: 4.4.22
Chair or Designate: Cor Baerveldt	Signature:



Package Code: AR –UGMP 9.20.22 - Revised

This package contains: [Undergraduate - Minor Program Changes](#)

Faculty approval date:

AAC Date: September 20 ,2022

Page	Department or Unit	What is Changing
2	Art & Design	HADVC BA Major
4	Art & Design	HADVC BA Minor
6	English and Film Studies	Creative Writing Minor (note ENGL 150)
7	English and Film Studies	English Major (note ENGL150)
9	English and Film Studies	English Minor (note ENGL 150)
11	History, Classics and Religion	Honors in History
13	MLCS	Minor in German



Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Arts – Art & Design	
Contact Person:	Elizabeth Boone	
Level of change (choose one only)	•	Undergraduate
	•	Graduate
Type of change request (check all that apply)	•	Program
	•	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No ?????	

Rationale

- *The Department would like to better integrate its curriculum by providing students in the History of Art, Design, and Visual Culture with the option of using up to 6 units in senior studio classes in Art (ART) and Design (DES). This change will also better prepare students who are interested in Contemporary Art and Research Creation by exposing them to the materials and methods employed in a studio environment today. This proposal was approved all faculty teaching in the History of Art, Design, and Visual Culture. It was also presented and approved by Art & Design Council, April 25, 2022.*

Calendar Copy

2023-24 Draft https://ualberta.acalogadmin.com/preview/preview_program.php?catoid=39&poid=47349

Major in History of Art, Design, and Visual Culture [Arts]

General Information

See Bachelor of Arts for additional regulations and requirements, including specific regulations for cross-listed courses.

Regulations

Students who major in History of Art, Design, and Visual Culture may not select their other subject of concentration from the Department of Art and Design.

Major in History of Art, Design, and Visual Culture [Arts]

General Information

See Bachelor of Arts for additional regulations and requirements, including specific regulations for cross-listed courses.

Regulations

Students who major in History of Art, Design, and Visual Culture may not select their other subject of concentration from the Department of Art and Design.

<p>Requirements for the Major Minimum of 30 units to a maximum of 48 units HADVC at the senior level, with at least 6 units at the 400-level.</p> <p>Notes</p> <ul style="list-style-type: none"> • Students who wish to major in History of Art, Design, and Visual Culture should take HADVC 101 and HADVC 102 in first year. • CLASS 254 and CLASS 255 may be used toward the senior level requirements. These courses may not be used toward the Basic Group 1 requirements. 	<p>Requirements for the Major Minimum of 30 units to a maximum of 48 units in HADVC at the senior level, with at least 6 units at the 400-level.</p> <p>Notes</p> <ul style="list-style-type: none"> • Students who wish to major in History of Art, Design, and Visual Culture should take HADVC 100 in their first year. • CLASS 254, CLASS 255, and up to 6 units in studio ART or DES courses may be used toward the senior level requirements.
---	---

+

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.

Other consultation groups, departments, or internal faculty approving bodies and approval dates.



Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Arts – Art & Design	
Contact Person:	Elizabeth Boone	
Level of change (choose one only)	•	Undergraduate
	•	Graduate
Type of change request (check all that apply)	•	Program
	•	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

HADVC 101 and 102 have been discontinued by the department and are inactive. HADVC 100 is the replacement for HADVC 101 and 102

Calendar Copy

2023-24 Draft https://ualberta.acalogadmin.com/preview/preview_program.php?catoid=39&poiid=47349

Minor in History of Art, Design, and Visual Culture [Arts]

General Information

This minor is commonly taken as part of the Bachelor of Arts program, which has additional regulations and requirements.

Students from other programs should note the regulations and requirements on their own program page.

Regulations

Students who major or minor in History of Art, Design, and Visual Culture may not select their other subject of concentration from the Department of Art and Design.

Minor in History of Art, Design, and Visual Culture [Arts]

General Information

This minor is commonly taken as part of the Bachelor of Arts program, which has additional regulations and requirements.

Students from other programs should note the regulations and requirements on their own program page.

Regulations

Students who major or minor in History of Art, Design, and Visual Culture may not select their other subject of concentration from the Department of Art and Design.

<p>Requirements for the Minor A minor requires a minimum of 12 units to a maximum of 42 units HADVC at the senior level, with at least 6 units at the 300 or 400-level.</p> <p>CLASS 254 and CLASS 255 may also be taken for the minor; however, students must still present 12 units overall in senior HADVC.</p> <p>Recommended Courses Students who wish to major or minor in History of Art, Design, and Visual Culture should take the following courses in their first year:</p> <ul style="list-style-type: none"> • HADVC 101 • HADVC 102 	<p>Requirements for the Minor A minor requires a minimum of 12 units to a maximum of 42 units in HADVC at the senior level, with at least 6 units at the 300 or 400-level.</p> <p>Note: CLASS 254 and CLASS 255 may be used toward the senior level requirements</p> <p>Recommended Courses Students who wish to major or minor in History of Art, Design, and Visual Culture should take HADVC 100 in their first year.</p>
---	---

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Form - Program and Regulations

See the [Calendar Guide](#) for tips on how to complete this form

Faculty of Arts	English and Film Studies
Level of change	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of Change	<input type="checkbox"/> Program <input checked="" type="checkbox"/> Regulation
Are there corresponding course changes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Additional Documentation Attached	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contact Person:	Eddy Kent, Director of UGrad Programs, Dept of EFS
Department/Unit Approval Date:	by Undergraduate Programs Committee (Sept 13, 2022)

Rationale for change (Indicate other consultation groups, departments, units or faculties)

In 2020-21, the department launched a new course, ENGL150, designed for students considering a major or minor in English. The course can also be used toward the English Requirement for the Minor in Creative Writing. The course was designated as not fulfilling the general BA requirement, and is indicated as such in the current Calendar: “3-units in 100-level ENGL (except ENGL150) or 3 units in 100-level WRS”

However that exception has caused some confusion about whether ENGL 150 counts toward the fulfilment of the requirements for the ENGL BA, described in the current Calendar as “6 units of junior English (or 3 units of junior ENGL plus WRS 101)”

We therefore request a clarifying note be added to the Calendar.

https://calendar.ualberta.ca/preview_program.php?catoid=36&pooid=42208

Calendar Copy

Current: Removed language (Include name of program)	Proposed: New language
<p>Minor in Creative Writing [Arts] [...]</p> <p>Notes</p> <p>1. 300- and 400-level WRITE Courses (and some 200-level WRITE courses) have specific prerequisites.</p> <p>2. Students taking English as a major and Writing as a minor cannot count WRITE courses toward requirements for the major.</p>	<p>Minor in Creative Writing [Arts] [...]</p> <p>Notes</p> <p>1. 300- and 400-level WRITE Courses (and some 200-level WRITE courses) have specific prerequisites.</p> <p>2. Students taking English as a major and Writing as a minor cannot count WRITE courses toward requirements for the major.</p> <p>3. ENGL 150 may be used to fulfil part of the “6 units of junior English” requirement.</p>

Calendar Change Form - Program and Regulations

See the [Calendar Guide](#) for tips on how to complete this form

Faculty of Arts	English and Film Studies
Level of change	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of Change	<input type="checkbox"/> Program <input checked="" type="checkbox"/> Regulation
Are there corresponding course changes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Additional Documentation Attached	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contact Person:	Eddy Kent, Director of UGrad Programs, Dept of EFS
Department/Unit Approval Date:	by Undergraduate Programs Committee (Sept 13, 2022)

Rationale for change (Indicate other consultation groups, departments, units or faculties)

In 2020-21, the department launched a new course, ENGL150, designed for students considering a major or minor in English. The course was designated as not fulfilling the general BA requirement, and is indicated as such in the current Calendar: "3-units in 100-level ENGL (except ENGL150) or 3 units in 100-level WRS"

However that exception has caused some confusion about whether ENGL 150 counts toward the fulfilment of the requirements for the ENGL BA, described in the current Calendar as "6 units of junior English (or 3 units of junior ENGL plus WRS 101)"

We therefore request a clarifying note be added to the Calendar.

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42208&returnto=11331

Calendar Copy

Current: Removed language (Include name of program)	Proposed: New language
<p>Major in English [Arts] [...]</p> <p>Requirements for the Major</p> <ul style="list-style-type: none"> 6 units of junior English (or 3 units of junior ENGL plus WRS 101) a minimum of 30 units to a maximum of 48 units at the 200-level or above, including: 9 units at the 200-level (or 6 units for students admitted prior to 2019-20) 9 units at the 300-level 6 units at the 400-level <p>Notes 1. The Department of English and Film Studies strongly recommends that students take a broad</p>	<p>Major in English [Arts] [...]</p> <p>Requirements for the Major</p> <ul style="list-style-type: none"> 6 units of junior English (or 3 units of junior ENGL plus WRS 101) a minimum of 30 units to a maximum of 48 units at the 200-level or above, including: 9 units at the 200-level (or 6 units for students admitted prior to 2019-20) 9 units at the 300-level 6 units at the 400-level <p>Notes 1. The Department of English and Film Studies strongly recommends that students take a broad</p>

<p>range of courses (consult the department website), including courses in:</p> <ul style="list-style-type: none"> • Indigenous literatures and cultures; • Canadian literature and culture; • pre-1900 literature and culture. <p>2. Certain 300- and 400-level WRITE (Creative Writing) courses have specific 200-level and/or 300-level prerequisites.</p> <p>3. Students taking English as a major and Creative Writing as a minor cannot count WRITE courses toward requirements for the major. WRITE and approved cross-listed courses apply as ENGL courses for students taking English as a major and a subject other than Creative Writing as a minor; however no more than 15 units of WRITE courses may be used to fulfill program requirements.</p>	<p>range of courses (consult the department website), including courses in:</p> <ul style="list-style-type: none"> • Indigenous literatures and cultures; • Canadian literature and culture; • pre-1900 literature and culture. <p>2. ENGL 150 may be used to fulfil part of the “6 units of junior English” requirement.</p> <p>3. Certain 300- and 400-level WRITE (Creative Writing) courses have specific 200-level and/or 300-level prerequisites.</p> <p>4. Students taking English as a major and Creative Writing as a minor cannot count WRITE courses toward requirements for the major. WRITE and approved cross-listed courses apply as ENGL courses for students taking English as a major and a subject other than Creative Writing as a minor; however no more than 15 units of WRITE courses may be used to fulfill program requirements.</p>
--	---

Calendar Change Form - Program and Regulations

See the [Calendar Guide](#) for tips on how to complete this form

Faculty of Arts	English and Film Studies
Level of change	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of Change	<input type="checkbox"/> Program <input checked="" type="checkbox"/> Regulation
Are there corresponding course changes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Additional Documentation Attached	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contact Person:	Eddy Kent, Director of UGrad Programs, Dept of EFS
Department/Unit Approval Date:	by Undergraduate Programs Committee (Sept 13, 2022)

Rationale for change (Indicate other consultation groups, departments, units or faculties)

In 2020-21, the department launched a new course, ENGL150, designed for students considering a major or minor in English. The course was designated as not fulfilling the general BA requirement, and is indicated as such in the current Calendar: “3-units in 100-level ENGL (except ENGL150) or 3 units in 100-level WRS”

However that exception has caused some confusion about whether ENGL 150 counts toward the fulfilment of the requirements for the ENGL BA, described in the current Calendar as “6 units of junior English (or 3 units of junior ENGL plus WRS 101)”

We therefore request a clarifying note be added to the Calendar.

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42208

Calendar Copy

Current: Removed language (Include name of program)	Proposed: New language
<p>Minor in English [Arts] [...]</p> <p>Requirements for the Minor See requirements for Minors found on the Bachelor of Arts (BA) page.</p> <p>A minor in English requires:</p> <ul style="list-style-type: none"> 6 units of junior English (OR 3 units of junior ENGL plus WRS 101) Minimum of 12 units to maximum of 42 units at the 200-level or higher of which 6 units must be at the 300-level or the 400-level. 	<p>Minor in English [Arts] [...]</p> <p>Requirements for the Minor See requirements for Minors found on the Bachelor of Arts (BA) page.</p> <p>A minor in English requires:</p> <ul style="list-style-type: none"> 6 units of junior English (OR 3 units of junior ENGL plus WRS 101) Minimum of 12 units to maximum of 42 units at the 200-level or higher of which 6 units must be at the 300-level or the 400-level.

<p>Note WRITE and approved cross-listed courses are considered English courses in the requirements for the minor (i.e., are included in the minimum and maximum); however, no more than 9 units may be taken in WRITE and approved cross-listed courses.</p>	<p>Note 1. ENGL 150 may be used to fulfil part of the “6 units of junior English” requirement. 2. WRITE and approved cross-listed courses are considered English courses in the requirements for the minor (i.e., are included in the minimum and maximum); however, no more than 9 units may be taken in WRITE and approved cross-listed courses.</p>
---	---

Calendar Change Form - Program and Regulations

See the [Calendar Guide](#) for tips on how to complete this form

Faculty of Arts	History, Classics and Religion
Level of change	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of Change	<input checked="" type="checkbox"/> Program <input type="checkbox"/> Regulation
Are there corresponding course changes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Additional Documentation Attached	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contact Person:	Shannon Stunden Bower, stundenbower@ualberta.ca
Department/Unit Approval Date: 09.09.22	

Rationale for change (Indicate other consultation groups, departments, units or faculties)

This change simplifies the calendar entry and accommodates recent contractions in faculty teaching capacity.

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42260

Calendar Copy

Current: Removed language (Include name of program)	Proposed: New language
<p>Honors in History [Arts] Honors in History</p> <p>[...]</p> <p>Program Requirements Honors in History requires a minimum of 48 units to a maximum of 60 units in History (including junior courses). In certain circumstances, selected Classics courses are accepted as the equivalent of History courses, subject to the approval of the Honors Advisor in such cases, and, when used in this manner, these courses will be included in the minimum and maximum permitted. Over the course of the Honors program, students should select courses that will provide them with a broad background of historical knowledge ranging widely in place, time, and perspective.</p>	<p>Honors in History [Arts] Honors in History</p> <p>[...]</p> <p>Program Requirements Honors in History requires a minimum of 48 units to a maximum of 60 units in History (including junior courses). In certain circumstances, selected Classics courses are accepted as the equivalent of History courses, subject to the approval of the Honors Advisor in such cases, and, when used in this manner, these courses will be included in the minimum and maximum permitted.</p> <p>Students are urged to enroll in courses closely related to their research interests while ensuring that, over the course of the Honors program, they gain a broad background of historical knowledge through courses that range widely in place, time, and perspective.</p>

Course Requirements

1. At least 42 units at the senior level in HIST including a minimum of 9 units at the 400-level in HIST;
2. An historiography seminar, HIST 500, is required during the third year;
3. HIST 501, Honors essay required during the fourth year. Students prepare the Honors essay under the supervision of a member of the Department.
4. Students must satisfy the Department of their ability to read a Language Other than English. Examinations for that purpose are conducted by the Department. These exams normally are written during the second or third year and must be passed for completion of degree. Honors History students who already have 6 units in one senior-level Language Other than English will be exempt from the language exam.

~~The Department of History, Classics, and Religion strongly recommends that students avoid undue concentration in any one field of History. Students are urged to take courses in different chronological eras, in different geographical areas, and among different themes; these include:~~

~~1. Chronological Eras: Ancient History, Medieval History (to 1500), Early Modern History (1450-1800) and Modern History (1750 to the present);~~

~~2. Geographical Areas: Africa and the Middle East, Asia, Canada, Europe (including Britain), Latin America, and the United States;~~

~~3. Thematic Fields: the History of Science, Medicine and Technology; the History of Religion; Women and Gender; and Perspectives on Empire.~~

Course Requirements

1. At least 42 units at the senior level in HIST including a minimum of 9 units at the 400-level in HIST;
2. An historiography seminar, HIST 500, is required during the third year;
3. HIST 501, Honors essay required during the fourth year. Students prepare the Honors essay under the supervision of a member of the Department.
4. Students must satisfy the Department of their ability to read a Language Other than English. Examinations for that purpose are conducted by the Department. These exams normally are written during the second or third year and must be passed for completion of degree. Honors History students who already have 6 units in one senior-level Language Other than English will be exempt from the language exam.



Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Arts – Modern Languages and Cultural Studies	
Contact Person:	Natalie Van Deusen	
Level of change (choose one only)	•	Undergraduate
	•	Graduate
Type of change request (check all that apply)	•	Program
	•	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

As a smaller area, we cannot offer all the required courses every year. In order to enable our students to fulfill the requirements for the German minor within a reasonable period of time, we are proposing more flexible requirements. We will still be able to ensure that students take a range of courses covering a variety of topics and fields, based on the courses we schedule. Students who come up through the language courses will be able to count GERM 303 as 3 and then they have to take 9 more credits (3 content courses). Students whose language skills are already beyond GERM 303 will take 12 in 300/400-level content courses. The German area was consulted and supports the proposed change.

Calendar Copy

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42208	
<p>Current Minor in Modern Languages and Cultural Studies [Arts] [...]</p> <p>German A minor in German requires a minimum of 12 units to a maximum of 42 units at the senior level in German including at least 6 units at the 300- or 400-level.</p> <p>Required courses are:</p>	<p>Proposed Minor in Modern Languages and Cultural Studies [Arts] [...]</p> <p>German A minor in German requires a minimum of 12 units at the 300- or 400-level to a maximum of 42 units at the senior level in GERM.</p>

<p>GERM 342 - Introduction to Translation: German and English 6 units from GERM 340 - Introduction to the Study of Modern German Literature GERM 343 - Postwar Cultures GERM 353 - Myths, Tales, and Legends 3 units from GERM 306 - German/English Phonetics and Phonology GERM 316 - Introduction to German Applied Linguistics GERM 317 - Teaching German as a Foreign Language</p> <p>Note:</p> <p>The Department encourages students to consult the Undergraduate Academic Advisor for German Studies.</p> <p><u>Refer to Notes in Honors in German.</u></p>	<p>Note:</p> <p>The Department encourages students to consult the Undergraduate Academic Advisor for German Studies.</p>
--	---

Reviewed/Approved by:

<p>REQUIRED: Approve by department on November 1, 2021</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

This package contains: [Undergraduate - Minor Program Changes](#)

Faculty approval date:

AAC Date: April 12,2022

Page	Department or Unit	What is Changing
2	Political Science	Certificate in Peace and Post-Conflict Studies

Submission Deadlines: – 09.21.21, 10.05.21, 10.21.21, 02.01.22, 03.29.22

Department: Political Science

Change: Undergraduate Minor Program Change

Rationale: The changes proposed here include: updating the format to be consistent with the layout of other Arts certificates, updating the list of courses to reflect current practice, and deleting courses which are no longer offered. The Departments of Sociology and of History, Classics, and Religion have checked their courses on the list for accuracy.

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42292

Calendar Copy:

<p>Current: Strike through and highlight deletions</p>	<p>Proposed: <u>Underline and highlight</u> additions</p>
<p>Certificate in Peace and Post-Conflict Studies</p> <p>In a global climate of conflict, fear and insecurity, the issue of building sustainable peace in countries that have undergone the ravages of conflict is of vital importance to policy makers and academics alike. This unique certificate in Peace and Post-Conflict Studies, will equip students from a number of Faculties and disciplines with knowledge of the complexity of instituting measures that address underlying sources of conflict and provide them with hands-on practical approaches to sustaining peace. The peace and post-conflict studies certificate is especially useful for those seeking a career in government, international governmental organizations (IGO), non-governmental organizations (NGO) and legal and business firms.</p> <p>This certificate may be pursued while fulfilling existing requirements in their respective disciplines.</p> <p>The Certificate in Peace and Post-Conflict Studies is administered by the Department of Political Science, Faculty of Arts.</p> <p>Certificate Requirements 27 units, including 21 units at the senior level, from the following courses: [...]</p> <p>HIST 114 - The History of the World in the Last 10 Years HIST 247 - Africa in the 20th and 21st Centuries: From Colonial Rule to Modern Nations</p> <p>HIST 295 - 20th-Century Warfare</p>	<p>Certificate in Peace and Post-Conflict Studies</p> <p>In a global climate of conflict, fear and insecurity, the issue of building sustainable peace in countries that have undergone the ravages of conflict is of vital importance to policy makers and academics alike. This unique certificate in Peace and Post-Conflict Studies, will equip students from a number of Faculties and disciplines with knowledge of the complexity of instituting measures that address underlying sources of conflict and provide them with hands-on practical approaches to sustaining peace. The peace and post-conflict studies certificate is especially useful for those seeking a career in government, international governmental organizations (IGO), non-governmental organizations (NGO) and legal and business firms.</p> <ul style="list-style-type: none"> • <u>Certificate Type: Embedded</u> • <u>Offered by: The Department of Political Science, Faculty of Arts</u> • <u>Who can take it: All Undergraduate students</u> • <u>For further information: about this certificate program, students should consult the Department's Website (https://www.ualberta.ca/political-science/undergraduate-programs/degree-programs-and-certificates/index.html)</u> <p>Certificate Requirements 27 units, including 21 units at the senior level, from the following courses: [...]</p> <p>HIST 114 - The History of the World in the Last 10 Years <u>HIST 128 - War, Revolution, and Society</u> HIST 247 - Africa in the 20th and 21st Centuries: From Colonial Rule to Modern Nations <u>HIST 291 - World War One</u> HIST 295 - 20th-Century Warfare</p>

<p>HIST 421 - Topics in the History of Europe *</p> <p>HIST 493 - War and Society in the Modern World</p> <p>INT D 375 - Intercultural Exploration of Health and Practice in Italy</p> <p>[...]</p> <p>PHIL 368 - Topics in Social Justice</p> <p>POL S 359 - Topics in International Politics *</p> <p>POL S 374</p> <p>POL S 445 - Topics in Globalization and Governance *</p> <p>POL S 459 - Topics in International Politics *</p> <p>POL S 460 - Global Security</p> <p>POL S 468 - International Organization</p> <p>POL S 469 - Ethics in International Relations</p> <p>SOC 343 - Social Movements</p> <p>SOC 369 - Sociology of Globalization</p> <p>SOC 477</p> <p>RELIG 102 - Introduction to Western Religious Traditions</p> <p>RELIG 103 - Introduction to Eastern Religious Traditions</p> <p>RELIG 422 - Advanced Studies in Islam</p> <p>WGS 260 - Women and War</p> <p>WGS 310 - Gender and Social Justice in Contemporary Africa</p> <p>WGS 365</p> <p>WGS 498 - Special Topics *</p>	<p>HIST 296 - World War Two</p> <p>HIST 322 - Russia in the 20th Century</p> <p>HIST 339 - The Modern British Empire and the Commonwealth Experience</p> <p>HIST 382 - History of Modern Japan</p> <p>HIST 421 - Topics in the History of Europe *</p> <p>HIST 493 - War and Society in the Modern World</p> <p>INT D 375 - Intercultural Exploration of Health and Practice in Italy</p> <p>[...]</p> <p>PHIL 368 - Topics in Social Justice</p> <p>POL S 359 - Topics in International Politics *</p> <p>POL S 380 - Politics in the Middle East</p> <p>POL S 445 - Topics in Globalization and Governance *</p> <p>POL S 459 - Topics in International Politics *</p> <p>POL S 460 - Global Security</p> <p>POL S 464 - Gender, Conflict and Security</p> <p>POL S 468 - International Organization</p> <p>POL S 469 - Ethics in International Relations</p> <p>POL S 479 - NGO Governance and Management</p> <p>SOC 343 - Social Movements</p> <p>SOC 369 - Sociology of Globalization</p> <p>SOC 425 - Sociology of Terrorism</p> <p>SOC 496 - Human Rights in International Perspective</p> <p>RELIG 102 - Introduction to Western Religious Traditions</p> <p>RELIG 103 - Introduction to Eastern Religious Traditions</p> <p>RELIG 422 - Advanced Studies in Islam</p> <p>WGS 260 - Women and War</p> <p>WGS 310 - Gender and Social Justice in Contemporary Africa</p> <p>WGS 498 - Special Topics *</p>
--	--

Department Contact: Siobhan Byrne	Department Council Approval Date: March 28, 2022
Chair or Designate: Catherine Kellogg	Signature:

Department confirmation of addition of HIST Courses to Certificate in Peace and Post-Conflict Studies

On Wed, Mar 30, 2022 at 1:20 PM Jaymie Heilman <jheilman@ualberta.ca> wrote:

Hi, Rebecca --

Everything looks good, but I do see a tiny error: HIST 296 should come AFTER HIST 295, not before. . .

Thanks so much,

jaymie

On Wed, Mar 30, 2022 at 1:14 PM Arts Associate Dean (Student Programs) <artsadsp@ualberta.ca> wrote:

Hi Jaymie,

Political Science is tidying up the Certificate in Peace and Post-Conflict Studies for the next Academic Affairs meeting.

Could you check over the attached change request form and confirm if the HIST courses on the list are correct (i.e. still offered, etc.)?

Thanks,

Rebecca

Department confirmation of addition of SOC Courses to Certificate in Peace and Post-Conflict Studies

On Wed, Mar 30, 2022 at 1:19 PM Alison Dunwoody <dunwoody@ualberta.ca> wrote:

Hi Rebecca,

This looks good to me. The courses on the updated list have all been offered recently and are expected to be offered again in the near future.

Best,

Alison

On Wed, Mar 30, 2022 at 1:14 PM Arts Associate Dean (Student Programs) <artsadsp@ualberta.ca> wrote:

Hi Alison,

Political Science is tidying up the Certificate in Peace and Post-Conflict Studies for the next Academic Affairs meeting.

Could you check over the attached change request form and confirm if the SOC courses on the list are correct (i.e. still offered, etc.)?

Thanks,

Rebecca

This package contains: **Undergraduate - Substantive Program Changes**

Faculty approval date:

AAC Date: April 12, 2022	AEC: May 5, 2022	AFC: May 19, 2022
--------------------------	------------------	-------------------

Page	Department or Unit	What is Changing
2	Economics	Combined Honors Regulation

Package Code: AR UGSP 041222-2

Calendar Change Request Form for Program and Regulation Changes

 See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Arts / Department of Economics
Contact Person:	Chelsi Hudson: econug@ualberta.ca
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
Type of change request (check all that apply) [?]	<ul style="list-style-type: none"> • Program • Regulation
For which term is this intended to take effect?	Fall 2022
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No

Rationale

Combined Honors credits: credits updated to accurately reflect the number of credits based on the requirements.

Combined Honors in Economics and Mathematics: the Mathematical and Statistical Sciences Department has imposed more structure on its Arts' Honors degree in mathematics. This increased number of required MATH courses leaves less room for Economics' recommendations of MMSS' field courses for students wanting to combine Honors in Economics and Mathematics in Arts. The proposed changes do not disallow the students to declare Combined Honors in Economics in Mathematics in Arts. The recommended changes update the calendar to reflect the reality of Economics' now-limited scope in recommendations. Note that there is a combined Honors program in Mathematics and Economics offered by the Faculty of Sciences.

Calendar Copy

https://calendar.ualberta.ca/preview_program.php?catoid=36&poide=43152

<p>Honors in Economics</p> <p>[...]</p> <p>Combined Honors in Economics</p> <p>General Information Students may also pursue a combined program in Economics and another discipline.</p> <p>Program Requirements The common requirements in a Combined Honors program are the same as for other Honors programs (see Bachelor of Arts Honors).</p>	<p>Honors in Economics</p> <p>[...]</p> <p>Combined Honors in Economics</p> <p>General Information Students may also pursue a combined program in Economics and another discipline.</p> <p>Program Requirements The common requirements in a Combined Honors program are the same as for other Honors programs (see Bachelor of Arts Honors).</p>
---	---

Package Code: AR UGSP 041222-2

A Combined Honors program in Economics and another discipline requires a minimum of 36 units (at the junior and senior levels) in Economics and a minimum of 36 units in the other discipline. Requirements in Economics for all Combined Honors programs in Economics except Economics and Mathematics are the same as listed in [Honors in Economics](#).

Students in the Combined Honors program in Economics and Mathematics may not receive credit for either ECON 386 or ECON 387, and should select further mathematics courses from MATH 334, MATH 372, MATH 373, MATH 381, MATH 417, MATH 418, MATH 421, and MATH 472.

Each Combined Honors program must have the approval of the Department of Economics and the other discipline. Only students enrolled in the Honors Essay route complete an Honors Essay. With the permission of the Honors Advisor, students pursuing Combined Honors in Economics (Honors Essay Route) and another discipline may write a combined honors essay (INT D 520) that is supervised jointly by faculty from both programs and the subject of which integrates both disciplines. In these circumstances, students will complete INT D 520 in place of ECON 400.

Note: 400-level AREC courses approved as Arts options will be applied as senior level ECON, but will not fulfill 400-level ECON requirements.

Required courses in a Combined Honors program in Economics and Mathematics

- ECON 101 - Introduction to Microeconomics **AND**
- ECON 102 - Introduction to Macroeconomics
- OR**
- ECON 204 - Principles of Economics
- MATH 117 - Honors Calculus I
- MATH 118 - Honors Calculus II
- MATH 127 - Honors Linear Algebra I
- ECON 281 - Intermediate Microeconomic Theory I
- ECON 282 - Intermediate Macroeconomic Theory I
- ECON 384 - Intermediate Microeconomic Theory II
- ECON 385 - Intermediate Macroeconomic Theory II
- ECON 399 - Introductory Econometrics
- ECON 481 - Advanced Microeconomic Theory
- ECON 482 - Advanced Macroeconomic Theory
- ECON 497 - Econometric Methods
- MATH 217 - Honors Advanced Calculus I
- MATH 227 - Honors Linear Algebra II
- MATH 317 - Honors Advanced Calculus II
- STAT 265 - Statistics I

A Combined Honors program in Economics and another discipline requires a minimum of 36 units (Essay Route) or 33 units (Graduate Study Route) at the senior level in Economics and a minimum of 36 units in the other discipline. Requirements in Economics for all Combined Honors programs in Economics are the same as listed in [Honors in Economics](#).

Students in the Combined Honors program in Economics and Mathematics may not receive credit for either ECON 386 or ECON 387.

Each Combined Honors program must have the approval of the Department of Economics and the other discipline. Only students enrolled in the Honors Essay route complete an Honors Essay. With the permission of the Honors Advisor, students pursuing Combined Honors in Economics (Honors Essay Route) and another discipline may write a combined honors essay (INT D 520) that is supervised jointly by faculty from both programs and the subject of which integrates both disciplines. In these circumstances, students will complete INT D 520 in place of ECON 400.

Note: 400-level AREC courses approved as Arts options will be applied as senior level ECON, but will not fulfill 400-level ECON requirements.

Package Code: AR UGSP 041222-2

<ul style="list-style-type: none">• STAT 266 – Statistics II	
--	--

Reviewed/Approved by:

Approved by Economics Department Council: 2022-03-21

Other consultation groups, departments, or internal faculty approving bodies and approval dates.


Duplicate Page Removed from Package







--	--	--



Duplicate Page Removed from Package



[Redacted]

[Redacted]

d

Duplicate Page Removed from Package

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Arts (Department of Art & Design)
Contact Person:	Caitlin Wells
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
Type of change request (check all that apply) [?]	<ul style="list-style-type: none"> • Program • Regulation
For which term is this intended to take effect?	ASAP
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No

Rationale

Apparently some aspects of our 2015 calendar change were entered incorrectly by the Calendar Editor in 2015. The idea for this change comes from the current Calendar Editor who feels that we should resubmit a calendar change for something that already went through governance and was already approved, and about which absolutely nothing has changed since it was approved in 2015. It will benefit students and the Department since the calendar presently suggests that a BFA requires 123* to complete, which is, of course, inaccurate, and has also invented a class called HADVC 438, which does not exist. Presumably, this change is comparable to all other calendar changes intended to cause the calendar to reflect truthful accurate information instead of problematic inaccurate information. The historical context is the error made by the 2015 Calendar Editor? The proposed change will facilitate program administration since we can't rely on a calendar with inaccurate information.

Calendar Copy

https://calendar.ualberta.ca/preview_program.php?catoid=34&poid=38068&returnto=10264

Current	Proposed
Removed language	New language
Bachelor of Fine Arts in Art and Design	Bachelor of Fine Arts in Art and Design
[...]	[...]
Year 4 (27 units)	Year 4 (27 units)

<ul style="list-style-type: none"> ● 300- or 400-level HADVC (3 units) ● 500-level ART (12 units) ● 300-, 400-, or 500-level ART or DES (6 units) ● Senior Arts or Science options and/or HADVC 400-level (6 units) ● Senior Arts or Science options and/or HADVC 400-level or HADVC 438: BFA Practicum (3 units) 	<ul style="list-style-type: none"> ● 300- or 400-level HADVC (3 units) ● 500-level ART (12 units) ● 300-, 400-, or 500-level ART or DES (6 units) ● Senior Arts or Science options and/or HADVC 400-level (3 units) ● Senior Arts or Science options and/or HADVC 400-level or ART 438: BFA Practicum (3 units)
--	--

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

Killam Centre for Advanced Studies
 2-29 Triffo Hall Edmonton AB Canada T6G 2E1
 Tel: 780.492.2816 / Fax: 780.492.0692
 www.gradstudies.ualberta.ca

2022-2023 University of Alberta Proposed Calendar Graduate Program Changes:

Current	Proposed
<p>Graduate Programs</p> <p>Graduate Certificate in Education Studies (Education)</p> <p>Laddering</p> <hr/> <p>Students who complete the certificate in good standing may be able to use the courses from the certificate to receive advanced standing in selected course-based Master of Education programs in the Faculty of Education.</p> <p>Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on laddering can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.</p>	<p>Graduate Programs</p> <p>Graduate Certificate in Educational Studies (Education)</p> <p>Laddering</p> <hr/> <p>Students who complete the certificate may be able to use the courses from the certificate to receive ★12 in advanced standing in selected course-based Master of Education programs in the Faculty of Education.</p> <p>Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on laddering can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.</p>
<p>Justification: The Faculty of Graduate Studies and Research requested that these editorial changes be made. These changes bring consistency in calendar description across two graduate certificates and two master degrees.</p> <p>Approved: May 2, 2022 by the Faculty of Education Graduate Academic Affairs Council (GAAC)</p>	

Killam Centre for Advanced Studies
 2-29 Triffo Hall Edmonton AB Canada T6G 2E1
 Tel: 780.492.2816 / Fax: 780.492.0692
www.gradstudies.ualberta.ca

2022-2023 University of Alberta Proposed Calendar Graduate Program Changes:

Current	Proposed
<p>Graduate Programs</p> <p>Graduate Certificate in School Leadership (Education)</p> <p>Laddering</p> <hr/> <p>Students who complete the certificate in good standing may be able to use the courses from the certificate to receive advanced standing in selected course-based Master of Education programs in the Faculty of Education. Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on laddering can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.</p>	<p>Graduate Programs</p> <p>Graduate Certificate in School Leadership (Education)</p> <p>Laddering</p> <hr/> <p>Students who complete the certificate may be able to use the courses from the certificate to receive ★12 in advanced standing in selected course-based Master of Education programs in the Faculty of Education.</p> <p>Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on laddering can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.</p>
<p>Justification: The Faculty of Graduate Studies and Research requested that these editorial changes be made. These changes bring consistency in calendar description across two graduate certificates and two master degrees.</p> <p>Approved: May 2, 2022 by the Faculty of Education Graduate Academic Affairs Council (GAAC)</p>	

Killam Centre for Advanced Studies
 2-29 Triffo Hall Edmonton AB Canada T6G 2E1
 Tel: 780.492.2816 / Fax: 780.492.0692
 www.gradstudies.ualberta.ca

2022-2023 University of Alberta Proposed Calendar Graduate Program Changes:

Current	Proposed
<p>Graduate Programs</p> <p>Master of Education in Educational Studies (Education)</p> <p>Laddering into the MEd in Educational Studies</p> <hr/> <p>Students who complete the Graduate Certificate in Educational Studies, the Graduate Certificate in School Leadership or an equivalent graduate certificate from the Faculty of Education in good standing may be able to use the courses from the certificate to receive up to 12 units in advanced standing in this program.</p> <p>Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on <u>laddering</u> can be found in the Calendar under <u>Regulations of the Faculty of Graduate Studies and Research</u>.</p>	<p>Graduate Programs</p> <p>Master of Education in Educational Studies (Education)</p> <p>Laddering into the MEd in Educational Studies</p> <hr/> <p><u>Students who complete the Graduate Certificate in Educational Studies or the Graduate Certificate in School Leadership from the Faculty of Education may be able to use the courses from one of the graduate certificates noted above to receive ★12 in advanced standing in this program.</u></p> <p>Completion of the certificate does not guarantee admission to a master’s degree program. The certificate may be used for both the basis of admission and laddered into the course-based master degree. Details on <u>laddering</u> can be found in the Calendar under <u>Regulations of the Faculty of Graduate Studies and Research</u>.</p>
<p>Justification: The Faculty of Graduate Studies and Research requested that these editorial changes be made. These changes bring consistency in calendar description across two graduate certificates and two master degrees.</p> <p>Approved: May 2, 2022 by the Faculty of Education Graduate Academic Affairs Council (GAAC)</p>	

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Kinesiology, Sport, & Recreation (KSR)
Contact Person:	Angela Bayduza, PhD - Associate Dean, Undergraduate Programs
Level of change (choose one only) [?]	<ul style="list-style-type: none"> Undergraduate
Type of change request (check all that apply) [?]	<ul style="list-style-type: none"> Program (minor)
For which term is this intended to take effect?	Fall 2023
Does this proposal have corresponding course changes? (Should be submitted at the same time)	None

Rationale

On the [Bachelor of Science in Kinesiology page in the Calendar](#), under Year 1 this motion proposes reduction of “6 units in 100-level ENGL OR 3 units in ENGL and 3 units in WRS” to “3 units in ENGL OR 3 units in WRS”. One of the primary reasons for this recommended change is intended to increase degree program completion flexibility for students by reducing the prescribed nature of the degree program and assisting students in ease of ability to find courses that have spaces in them for them to register in. Again, enhancing degree program continuation. It has become increasingly more difficult for students to gain access to these ENG and WRS courses. As well, this recommended change is intended to align the ENG/WRS requirements of this program with KSR’s BKin ENG/WRS program requirements.

Under Year 3, "6 units in Open Option" has been duplicated, once as a bullet point and once as letter a. A count of the number of units listed supports this as a duplicate statement. The removal of "a. 6 units in Open Option" is editorial in nature.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=43024

Current	Proposed
<p>Program Requirements Students in the BSc (Kin) Degree take a program of 120 units over a four year period, consisting of:</p> <ol style="list-style-type: none"> Degree core: A group of required courses in Kinesiology totalling 93 units Practicum Component: (9 units) Part-time or (15 units) Full-time practicum Option component: <ol style="list-style-type: none"> Open Options: A group of courses totalling 12 units which may be taken from within or outside the Faculty of Kinesiology, Sport, 	<p>Program Requirements Students in the BSc (Kin) Degree take a program of 120 units over a four year period, consisting of:</p> <ol style="list-style-type: none"> Degree core: A group of required courses in Kinesiology totalling 90 units Practicum Component: (9 units) Part-time or (15 units) Full-time practicum Option component: <ol style="list-style-type: none"> Open Options: A group of courses totalling 15 units which may be taken from within or outside the Faculty of Kinesiology, Sport,

and Recreation.

- b. Faculty Options: 0 units/6 units chosen from courses within the Faculty of Kinesiology, Sport, and Recreation.

Note: Students who choose a 9-unit part-time practicum will do 6 units in Faculty Options; students who choose a 15-unit full-time practicum will not require any additional Faculty Options.

Course Sequence for BSc in Kinesiology

Students are advised to follow the prescribed order as closely as possible.

Year 1 (30 units)

- 6 units in 100-level ENGL OR 3 units in ENGL and 3 units in WRS
- CHEM 101 - Introductory University Chemistry I
- HE ED 120 - Introduction to the Biological Aspects of Fitness to Health
- KIN 100 - Human Anatomy
- KIN 101 - Introduction to Human Physiology
- KIN 103 - Integrative Human Physiology
- KRLS 104 - Introduction to Sociology of Sport and Leisure in Canadian Society
- KRLS 105 - Introduction to the Management of Sport, Physical Activity and Recreation Programs

One of:

- KIN 109 - Statistics, Measurement, and Evaluation
- STAT 151 - Introduction to Applied Statistics I

...

Year 3 (30 units)

- BIOCH 200 - Introductory Biochemistry
- KIN 303 - Psychology of Sport and Physical Activity OR
- HE ED 321 - Psychological Dimensions of Health Promotion
- KIN 306 - Quantitative Biomechanics of Human Movement
- KIN 311 - Assessment of Fitness and Health
- KIN 334 - Physical Activity, Nutrition and Energy Balance
- KIN 335 - Advanced Conditioning Methodology
- 6 units in Open Option

3-unit List A Faculty Option

and Recreation.

- b. Faculty Options: 0 units/6 units chosen from courses within the Faculty of Kinesiology, Sport, and Recreation.

Note: Students who choose a 9-unit part-time practicum will do 6 units in Faculty Options; students who choose a 15-unit full-time practicum will not require any additional Faculty Options.

Course Sequence for BSc in Kinesiology

Students are advised to follow the prescribed order as closely as possible.

Year 1 (30 units)

- 3 units in ENGL OR 3 units in WRS
- CHEM 101 - Introductory University Chemistry I
- HE ED 120 - Introduction to the Biological Aspects of Fitness to Health
- KIN 100 - Human Anatomy
- KIN 101 - Introduction to Human Physiology
- KIN 103 - Integrative Human Physiology
- KRLS 104 - Introduction to Sociology of Sport and Leisure in Canadian Society
- KRLS 105 - Introduction to the Management of Sport, Physical Activity and Recreation Programs

One of:

- KIN 109 - Statistics, Measurement, and Evaluation
- STAT 151 - Introduction to Applied Statistics I
- 3 units in Open Option

...

Year 3 (30 units)

- BIOCH 200 - Introductory Biochemistry
- KIN 303 - Psychology of Sport and Physical Activity OR
- HE ED 321 - Psychological Dimensions of Health Promotion
- KIN 306 - Quantitative Biomechanics of Human Movement
- KIN 311 - Assessment of Fitness and Health
- KIN 334 - Physical Activity, Nutrition and Energy Balance
- KIN 335 - Advanced Conditioning Methodology
- 6 units in Open Option

3-unit List A Faculty Option

Students should contact the Student Services Office for detailed information about List A Faculty Options.

3-unit List B Faculty Option

Students should contact the Student Services Office for detailed information about List B Faculty Options.

~~a. 6 units in Open Option~~

[...]

Students should contact the Student Services Office for detailed information about List A Faculty Options.

3-unit List B Faculty Option

Students should contact the Student Services Office for detailed information about List B Faculty Options.

[...]

Reviewed/Approved by:

KSR Undergraduate Programs Committee: September 14, 2022
KSR Faculty Executive: September 28, 2022
KSR Faculty Council: October 5, 2022

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Biochemistry
Contact Person:	Jonathan Parrish jparrish@ualberta.ca
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

BIOCH 401: New Course - BIOCH 401 (a full-year course) was replaced two years ago with the single term courses BIOCH 400 and BIOCH 404 in response to the pandemic. The Department of Biochemistry would like to reinstate the full year course BIOCH 401 as this provides greater opportunity for more formative evaluations and continuity for students taking this course. The course description is identical to the one from 2020.

BIOCH 410: The Department of Biochemistry wishes to change the BIOCH 410 (and the graduate version BIOCH 510) course description to more accurately reflect the current course content and instruction.

BIOCH 415: BIOCH 415 was introduced two years ago as a new course, and based on instructor and student feedback, the Department of Biochemistry wishes to change the described format of BIOCH 415 slightly to reflect the current form of instruction.

BIOCH 419: The Department of Biochemistry wishes to change the BIOCH 419 course offering from graded to Credit/No Credit. This grading change is more in line with this being workshop course with formative feedback as opposed to having a summative evaluation

BIOCH 430: The Department of Biochemistry wishes to change the BIOCH 430 (and the graduate version BIOCH 530) course description to more accurately reflect the current course content and instruction.

BIOCH 450: Course deletion - BIOCH 450 was last offered in the Fall term of 2016, and the Department of Biochemistry not expect to offer this course again.

Course Template

<p>Current</p> <p>NEW COURSE</p>	<p>Proposed</p> <p>BIOCH 401</p> <p>Biochemistry Laboratory</p> <p>Course Career Undergraduate Units 6 Approved Hours 0-0-8 Fee index 12 Faculty Medicine and Dentistry Department Biochemistry Typically Offered Two term</p> <p>Description Laboratory course in modern biochemical techniques. Designed for Biochemistry Honors and Specialization students in their third or fourth year. Other interested students may enrol subject to space limitations. Prerequisites: BIOCH 320 and 330 with a minimum grade of B-, and consent of Department.</p>
<p>BIOCH 410</p> <p>Signal Transduction</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description Principles of the biochemistry of cell communication and signal transduction through receptor activation, the generation of second messengers, and the control of protein modifications. The course will emphasize the mechanisms responsible for the regulation of cell migration, division and death. Prerequisites: BIOCH 310, 320 and 330, all with a minimum grade of B-, or consent of the Department. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with the consent of the Department. Graduate students may not register for credit (see BIOCH 510).</p>	<p>BIOCH 410</p> <p>Signal Transduction</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description Principles of the biochemistry of cell communication and signal transduction through receptor activation, generation of second messengers, control of protein modifications and regulation of the cell cycle. The course emphasizes mechanisms responsible for the regulation of cell migration, division and death with an emphasis on cancer. Prerequisites: BIOCH 310, 320 and 330, all with a minimum grade of B-, or consent of the Department. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with the consent of the Department. Graduate students may not register for credit (see BIOCH 510).</p>

<p>BIOCH 415</p> <p>Metabolic Modifications in Health and Disease</p> <p>Course Career Undergraduate Units 3 Approved Hours 2-4S-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description This course introduces students to adaptive and pathological changes in human metabolic pathways. The course will cover various situations which alter the 'normal' function of the metabolic pathways, such as lifestyle modifications (e.g. exercise, diet), starvation, cancer, diabetes, aging and neurodegenerative disorders, immune diseases, and mitochondrial diseases. Prerequisite(s): BIOCH 310 with a minimum grade of B-, or consent of the Department.</p>	<p>BIOCH 415</p> <p>Metabolic Modifications in Health and Disease</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description This course introduces students to adaptive and pathological changes in human metabolic pathways. The course will cover various situations which alter the 'normal' function of the metabolic pathways, such as lifestyle modifications (e.g. exercise, diet), starvation, cancer, diabetes, aging and neurodegenerative disorders, immune diseases, and mitochondrial diseases. Prerequisite(s): BIOCH 310 with a minimum grade of B-, or consent of the Department.</p>
<p>BIOCH 419</p> <p>Communicating Biochemistry</p> <p>Course Career Undergraduate Units 3 Approved Hours 0-3S-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description This course introduces students to the skills required to effectively communicate research in biochemistry. Communication skills will be developed through critical evaluation, identification of effective techniques, and practice. Students will communicate research data to various target audiences, through oral presentations in particular and with a focus on the effective use of images and diagrams to represent and explain research findings. Prerequisites: BIOCH 310, 320 and 330, and consent of the instructor. Co-requisite: BIOCH 499. This course is restricted to students in Honors or Specialization in Biochemistry.</p>	<p>BIOCH 419</p> <p>Communicating Biochemistry</p> <p>Course Career Undergraduate Units 3 Approved Hours 0-3S-0 Fee index 6 Faculty Medicine and Dentistry Department Biochemistry Typically Offered either term</p> <p>Description This credit/no-credit course introduces students to the skills required to effectively communicate research in biochemistry. Communication skills will be developed through critical evaluation, identification of effective techniques, and practice. Students will communicate research data to various target audiences, through oral presentations in particular and with a focus on the effective use of images and diagrams to represent and explain research findings. Prerequisites: BIOCH 310, 320 and 330, and consent of the instructor. Co-requisite: BIOCH 499. This course is restricted to students in Honors or Specialization in Biochemistry.</p>

BIOCH 430**Biochemistry of Eukaryotic Gene Expression****Course Career Undergraduate****Units 3****Approved Hours 3-0-0****Fee index 6****Faculty Medicine and Dentistry****Department Biochemistry****Typically Offered either term****Description**

The organization and expression at the molecular level of information encoded in the nucleic acids of eukaryotic cells. The focus will be on genome structure and the regulation of gene expression at the levels of transcription, post-transcriptional processing, translation, post-translational modification and protein sorting. Recombinant DNA technologies and genetic engineering will be discussed as methods for studying the cellular processing of genetic information. Prerequisites: BIOCH 320 and 330, both with a minimum grade of B- or consent of Department. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with the consent of the Department. Graduate students may not register for credit (see BIOCH 530).

BIOCH 430**Biochemistry of Eukaryotic Gene Expression****Course Career Undergraduate****Units 3****Approved Hours 3-0-0****Fee index 6****Faculty Medicine and Dentistry****Department Biochemistry****Typically Offered either term****Description**

This course focuses on the biochemical mechanisms underlying the regulation of gene expression in eukaryotic cells. The focus will be on the regulation of gene expression at the levels of transcription, post-transcriptional processing, and translation. The course will specifically address biochemical and structural mechanisms underlying gene regulation, as well as biochemical experimental methods that can be used to probe these activities. Prerequisites: BIOCH 320 and 330, both with a minimum grade of B- or consent of Department. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with the consent of the Department. Graduate students may not register for credit (see BIOCH 530).

BIOCH 450**The Molecular Biology of Mammalian Viruses****Course Career Undergraduate****Units 3****Approved Hours 3-0-0****Fee index 6****Faculty Medicine and Dentistry****Department Biochemistry****Typically Offered either term****Description**

This course will focus on virus structure, replication, and interaction with host cells at the molecular level. Lytic viruses with single or double stranded DNA or RNA genomes will be discussed, as will the mechanisms of viral oncogenesis. Prerequisites: BIOCH 320 and 330, with a minimum grade of B- or consent of Department. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with

COURSE DELETION

the consent of the Department. Graduate students may not register for credit (see BIOGH 550).

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – August 22, 2022
FoMD Faculty Council (for information/suggestions/challenges) – September 16, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Dental Hygiene, School of Dentistry, FoMD	
Contact Person:	Meghan Rannells (dhyg@ualberta.ca)	
Level of change (choose one only) [?]	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
For which term will this change take effect?	Fall 2023	

Rationale

D HYG 299/399/499 Course Description Changes:

After reviewing this series of courses, it was identified that broad descriptions were necessary that outline the basic tenets of interprofessional education and practice rather than specific competencies. This was also to ensure that shifts in collaborations due to timetabling challenges across various health professions could be accommodated more easily.

D HYG 480 Course Description Changes:

After reviewing the course curriculum, content was moved from this course to other courses that are delivered earlier in the program and other content was added to address practice management, leadership and entrepreneurial competencies. The new course description reflects the modification of the content.

D HYG 370 Course Description Changes:

After reviewing the course, it was identified that there would be a benefit to student learning to reorder the Fall and Winter term content; therefore, the calendar course description needed to be revised to align with the content delivery.

D HYG 240 Course Hours change:

It was determined that the number of course hours identified in the calendar did not correlate to the actual number of hours of instruction. The 2 credit course consists of 33 hours of instruction as opposed to the previously published 43 hours.

D HYG 255 Course Change:

Starting in 2017, the overall two-year diploma curriculum was revised and redistributed across three years for the degree program. There is a need to situate 13 hours of introductory content in YR2 of the curriculum so this course is being increased in hours to accommodate the needed content.

D HYG 390 Course Addition:

After a comprehensive review of the new dental hygiene degree program curriculum, a gap in content was identified relating to research methods, critical appraisal of research and evidence-informed practice. This new course will be scheduled in YR3 (1 credit) and a second course will be scheduled in YR4 (2 credits). The 2 new courses equal 3 credits and are offset by removing the mandatory 3 credit option course; therefore, the total course weight across years three and four of the program does not change.

D HYG 490 Course Addition:

After a comprehensive review of the new dental hygiene degree program curriculum, a gap in content was identified relating to research methods, critical appraisal of research and evidence-informed practice. This new course will be scheduled in YR3 (1 credit) and a second course will be scheduled in YR4 (2 credits). The 2 new courses equal 3 credits

and are offset by removing the mandatory 3 credit option course; therefore, the total course weight across years three and four of the program does not change.

OBIOL 203 Course Addition:

OBIOL 203 Survey of Biochemistry is a 2-credit course that will introduce the general biochemical concepts that are the basis of life; this 2-credit course is replacing a 3-credit BIOCH course currently listed in the Program. The decrease from three to two credits in the study of biochemistry aligns more appropriately to provide foundational learning for the study of dental hygiene sciences.

Course Template

<p>D HYG 299</p> <p>Dental Hygiene Collaborative Practice I</p> <p>Course Career Undergraduate Units 1 Approved Hours 12 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description Introduction to the fundamentals of interprofessional collaborative practice by learning with, from, and about other health professions to enhance quality patient care.</p>	<p>D HYG 299</p> <p>Dental Hygiene Collaborative Practice I</p> <p>Course Career Undergraduate Units 1 Approved Hours 13 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description This course introduces the foundations and core competencies of professionalism and interprofessional collaborative practice. It develops knowledge and skills to practice and collaborate effectively to enhance quality dental hygiene practice.</p>
<p>D HYG 399</p> <p>Dental Hygiene Collaborative Practice II</p> <p>Course Career Undergraduate Units 1 Approved Hours 12 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description Role clarity and communication within healthcare teams will be explored with an emphasis on the dental healthcare team.</p>	<p>D HYG 399</p> <p>Dental Hygiene Collaborative Practice II</p> <p>Course Career Undergraduate Units 1 Approved Hours 13 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description This course builds upon the foundations of professionalism and interprofessional collaborative practice introduced in D HYG 299.</p>

<p>D HYG 499</p> <p>Dental Hygiene Collaborative Practice III</p> <p>Course Career Undergraduate Units 1 Approved Hours 12 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description Advancing collaborative practice competencies through applications within diverse health care contexts.</p>	<p>D HYG 499</p> <p>Dental Hygiene Collaborative Practice III</p> <p>Course Career Undergraduate Units 1 Approved Hours 13 hours Fee index 2 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description This course expands on the knowledge, skills and abilities for interprofessional collaboration established in D HYG 399.</p>
<p>D HYG 480</p> <p>Behavioural Sciences IV</p> <p>Course Career Undergraduate Units 3 Approved Hours 39 HOURS Fee index 6 Faculty Medicine and Dentistry Department Dentistry Typically Offered either term</p> <p>Description This course advances on various concepts related to dental hygiene core competencies aligned predominantly with the areas of professionalism, communication, collaboration, leadership as well as with the service competencies. Within the service competency domain, the course explores behaviour change methods, models and resources in relation to addictions and substance abuse.</p>	<p>D HYG 480</p> <p>Behavioural Sciences IV</p> <p>Course Career Undergraduate Units 3 Approved Hours 39 HOURS Fee index 6 Faculty Medicine and Dentistry Department Dentistry Typically Offered either term</p> <p>Description This course advances various concepts related to dental hygiene core competencies aligned predominantly with the areas of professionalism, communication, collaboration, coordination, and leadership. Within the service competency domain, the course explores various concepts related to preparation for dental hygiene practice, practice management and regulatory requirements of a dental hygienist.</p>
<p>D HYG 370 - Behavioural Sciences II</p> <p>Course Career Undergraduate Units 4 Approved Hours 61 HOURS Fee index 8 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description This course builds on the dental hygiene core and service competencies. Students learn teaching and learning methodologies and incorporate these concepts into health</p>	<p>D HYG 370 - Behavioural Sciences II</p> <p>Course Career Undergraduate Units 4 Approved Hours 61 HOURS Fee index 8 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description This course explores the social determinants of health, principles of public health, epidemiology and concepts specific to dental public health to prepare students for</p>

<p>promotion activities in culturally diverse community settings. The second part of the course delves into the social determinants of health, principles of public health, epidemiology and concepts specific to dental public health to prepare students for evaluating public health initiatives and planning opportunities to promote oral health for various populations groups.</p>	<p>evaluating public health initiatives and planning opportunities to promote oral health for various population groups. Students learn teaching and learning methodologies and incorporate these concepts into health promotion activities in diverse community settings.</p>
<p>D HYG 240 - Oral Radiology I Course Career Undergraduate Units 2 Approved Hours 43 HOURS Fee index 4 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description A comprehensive didactic, pre-clinical and clinical course that deals with the production of x-rays, their interactions with matter, radiation biology and protection, the appearances of normal anatomy on radiographs and common abnormalities seen on radiographs made in the practice of dental hygiene. Pre-clinical and clinical sessions will introduce students to the basic techniques of intraoral radiography and pantomography.</p>	<p>D HYG 240 - Oral Radiology I Course Career Undergraduate Units 2 Approved Hours 33 HOURS Fee index 4 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description A comprehensive didactic, pre-clinical and clinical course that deals with the production of x-rays, their interactions with matter, radiation biology and protection, the appearances of normal anatomy on radiographs and common abnormalities seen on radiographs made in the practice of dental hygiene. Pre-clinical and clinical sessions will introduce students to the basic techniques of intraoral radiography and pantomography.</p>
<p>D HYG 255 Oral Health Sciences I Course Career Undergraduate Units 4 Approved Hours 52 HOURS Fee index 8 Faculty Medicine and Dentistry Department Dentistry Typically Offered two term</p> <p>Description Introduction to the dental hygiene process of care model and other foundational theory in preparation for the delivery of dental hygiene care. Topics include assessments, diagnosis, planning, implementation and evaluation of dental hygiene care (ADPIE). Topics also include an introduction to ethics and jurisprudence, epidemiology and professionalism.</p>	<p>D HYG 255 Oral Health Sciences I Course Career Undergraduate Units 5 Approved Hours 65 HOURS Fee index 10 Faculty of Medicine and Dentistry Department of Dentistry Typically Offered two term</p> <p>Description Introduction to fundamental theory and concepts for dental hygiene practice. Multiple topics are introduced including but not limited to the dental hygiene process of care model, evidence-informed practice, collaboration and coordination of care, ethics and jurisprudence, and professionalism.</p>

NEW COURSE	<p>D HYG 390 Introduction to Research Course Career Undergraduate Units 1 Approved Hours 13 HOURS Fee index 2 Faculty of Medicine and Dentistry Department of Dentistry Typically offered either term</p> <p>Description Introduces basic principles involved in research design and methodology including introduction to critical analysis of oral health research.</p>
NEW COURSE	<p>D HYG 490 Evidence Informed Dental Hygiene Practice Course Career Undergraduate Units 2 Approved Hours 26 HOURS Fee index 4 Faculty of Medicine and Dentistry Department of Dentistry Typically offered two term</p> <p>Description This course advances research concepts from D HYG 390. Emphasis will be on the development of critical thinking abilities, information literacy skills and the use of research to support oral health practice decisions and recommendations.</p>
NEW COURSE	<p>OBIOL 203 Survey of Biochemistry Course Career Undergraduate Units 2 Approved Hours 30 Fee Index 4 Faculty Medicine and Dentistry Department Dentistry Typically Offered Either Term</p> <p>Description This survey course introduces the general biochemical concepts that are the basis of life. Topics will include protein structure and function; enzyme kinetics; lipids and biological membranes; carbohydrate, fatty acid and amino acid metabolism; and nucleic acid structure and function. Prerequisites: CHEM 101 or equivalent and CHEM 261 or 164 or equivalent. Students who have obtained credit for</p>

	BIOCH 200 cannot take OBIOL 203 for credit.
--	---

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – August 2, 2022 FoMD Faculty Council (for information/suggestions/challenges) – August 25, 2022
--

Other consultation groups, departments, or internal faculty approving bodies and approval dates.
--

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Pharmacology
Contact Person:	James Hammond
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

PMCOL 301 and 302 are the same course offered in the Fall and Winter terms, respectively. Hence, the proposed changes apply to both courses. The course descriptions are updated to reflect recent changes introduced. In the current form only faculty members of the Department of Pharmacology were able to supervise students in this course. In the past two years the Department has made exceptions on this rule accepting supervisors from other Faculties/Departments. Based on the success on these experiences, the Department of Pharmacology has decided to accept supervisors from other units with the requirement that a faculty member from the Department of Pharmacology sponsors the arrangement. This is common practice in research courses from similar programs, namely Physiology and Cell Biology. This change will offer more options to the students. This is particularly important in the context of the significant increase of the number of students enrolled in the program and the shrinking number of faculty members that resulted from faculty member retirements without replacement. The proposed description indicates that the student requires to secure a supervisor before registration. This is essential due to the nature of the courses. Guidelines for securing a supervisor will be added to the Departmental website. The proposed description also outlines better the learning outcomes of the courses. The courses will not be offered in Spring/Summer session (statement is deleted). Offering the courses in Spring/Summer was unsuccessful. The short time of the Spring/Summer term required a very steep learning of techniques and performance of experiments by untrained students. The faculty member and other students' supervisors (PDFs, graduate students) needed to dedicate extensive efforts, sometimes jeopardizing their own work, for the students enrolled in the course to have a positive experience.

Course Template

Current	Proposed
PMCOL 301 -	PMCOL 301 -
Title Introduction to Research in Pharmacology	Title Introduction to Research in Pharmacology
Course Career Undergraduate	Course Career Undergraduate
Units 3	Units 3
Approved Hours 0-0-8	Approved Hours 0-0-8
Fee index 6	Fee index 6
Faculty Science	Faculty Science

Department Pharmacology
Typically Offered first term

Description

This course is designed to introduce students to pharmacological research. ~~The project is carried out~~ in a laboratory under the supervision of a member of the Department of Pharmacology. ~~Laboratory projects may involve current topics and methodologies in diverse areas of Cardiovascular, Diabetes, Neuroscience or Molecular Pharmacology.~~ Completion of this course requires a written report of the project and ~~an oral~~ presentation to an examining committee. Restricted to Pharmacology Honors or Specialization students in the third year of their program. There may be a limited number of spaces available. ~~This course can also be taken as a six week Spring/Summer session course.~~ Please contact the course coordinator for registration in the course

Department Pharmacology
Typically Offered first term

Description

This course is designed to introduce students to pharmacological research. ~~The student will carry out an individual research project~~ in a laboratory under the supervision of a member of the Department of Pharmacology. Supervision by Professors from other Departments may be possible, provided that a sponsor from the Department of Pharmacology is identified and the project is relevant to the discipline of Pharmacology. ~~Students must secure a supervisor before registration.~~ There may be a limited number of spaces available. ~~The course offers formal opportunity to gain hands-on experience and develop skills within a research laboratory setting. Students will have a chance to become familiar with good lab practices, develop critical thinking, evaluation and troubleshooting skills, while applying their knowledge to practical research questions.~~ Completion of this course requires a written report of the project and ~~a~~ presentation to an examining committee. Restricted to Pharmacology Honors or Specialization students in the third year of their program. Registration must be approved by the Department of Pharmacology. Please contact the course coordinator for registration in the course.

Current

PMCOL 302 -

Title

Introduction to Research in Pharmacology

Course Career Undergraduate

Units 3

Approved Hours 0-0-8

Fee index 6

Faculty Science

Department Pharmacology

Typically Offered second term

Description

This course is designed to introduce students to pharmacological research. ~~The project is carried out~~ in a laboratory under the supervision of a member of the Department of Pharmacology. ~~Laboratory projects may involve current topics and methodologies in diverse areas of Cardiovascular, Diabetes, Neuroscience or Molecular Pharmacology.~~ Completion of this course requires a

Proposed

PMCOL 302 -

Title

Introduction to Research in Pharmacology

Course Career Undergraduate

Units 3

Approved Hours 0-0-8

Fee index 6

Faculty Science

Department Pharmacology

Typically Offered second term

Description

This course is designed to introduce students to pharmacological research. ~~The student will carry out an individual research project~~ in a laboratory under the supervision of a member of the Department of Pharmacology. Supervision by Professors from other Departments may be possible, provided that a sponsor from the Department of Pharmacology is identified and

<p>written report of the project and an oral presentation to an examining committee. Restricted to Pharmacology Honors or Specialization students in the third year of their program. There may be a limited number of spaces available. This course can also be taken as a six week Spring/Summer session course. Please contact the course coordinator for registration in the course</p>	<p>the project is relevant to the discipline of Pharmacology. Students must secure a supervisor before registration. There may be a limited number of spaces available. The course offers formal opportunity to gain hands-on experience and develop skills within a research laboratory setting. Students will have a chance to become familiar with good lab practices, develop critical thinking, evaluation and troubleshooting skills, while applying their knowledge to practical research questions. Completion of this course requires a written report of the project and a presentation to an examining committee. Restricted to Pharmacology Honors or Specialization students in the third year of their program. Registration must be approved by the Department of Pharmacology. Please contact the course coordinator for registration in the course.</p>
--	--

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 20, 2022
 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.
 Departmental approval- Sep 9, 2022

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Pharmacology
Contact Person:	Dr James R Hammond
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

PMCOL 401 and 402 are the same course offered in the Fall and Winter terms, respectively. Hence the rationale for the modifications is the same for both. The descriptions of the courses were modified to reflect the following changes:

- The courses will be offered to both Specialization students AND Honor students in the Stream B
- Student supervision by Professors from other Departments would be possible, provided that a sponsor from the Department of Pharmacology is identified.
- Students are asked to secure a supervisor before registration. Guidelines to help students to find a supervisor will be added to the Departmental website.
- Literature -based projects will not be eligible in this course, students will be directed to take PMCOL 403 instead.
- Assessments will involve oral or poster presentations to an audience of peers and evaluators.
- The language of the description will be consistent with PMCOL 301 and PMCOL 302.

Course Template

Current	Proposed
PMCOL 401 -	PMCOL 401 -
Title Pharmacology Tutorial	Title Pharmacology Tutorial
Course Career Undergraduate	Course Career Undergraduate
Units 3	Units 3
Approved Hours 0-0-8	Approved Hours 0-0-8
Fee index 6	Fee index 6
Faculty Medicine and Dentistry	Faculty Medicine and Dentistry
Department Pharmacology	Department Pharmacology
Typically Offered first term	Typically Offered first term
Description Independent research course. "Hands-on" experience is seen as a valuable asset for students graduating from BSc programs. With this in mind, this course provides an	Description The student will carry out an individual research project in a laboratory under the supervision of a member of the Department of Pharmacology. Supervision by Professors

opportunity to work with a Faculty member on a research project during the Fall semester. The student and supervisor will mutually agree upon the details of the project. This is an excellent opportunity to learn current laboratory techniques, data analysis, laboratory notebook maintenance and presentation skills. Literature-based projects may also be available in which the student will be required to identify a research question and meet with the supervisor at regular intervals for discussion and guidance on preparation of a term paper and poster presentation. Prerequisites: PMCOL 343 and 344. Available only to students in the Pharmacology Specialization program or students who are granted consent by the Department of Pharmacology.

from other Departments may be possible, provided that a sponsor from the Department of Pharmacology is identified and the project is relevant to the discipline of Pharmacology. Students must secure a supervisor before registration. The course offers formal opportunity to gain hands-on experience and develop skills within a research laboratory setting. Students will have a chance to become familiar with good lab practices, develop critical thinking, evaluation and troubleshooting skills, while applying their knowledge to practical research questions. Completion of this course requires a written report of the project and a presentation to an examining committee. Restricted to Pharmacology Specialization students or Honor students in Stream B in the fourth year of their program. Registration must be approved by the Department of Pharmacology. Please contact the course coordinator for registration in the course.

Current

PMCOL 402 -

Title
Pharmacology Tutorial

Course Career Undergraduate

Units 3

Approved Hours 0-0-8

Fee index 6

Faculty Medicine and Dentistry

Department Pharmacology

Typically Offered second term

Description

Independent research course. "Hands-on" experience is seen as a valuable asset for students graduating from BSc programs. With this in mind, this course provides an opportunity to work with a Faculty member on a research project during the Fall semester. The student and supervisor will mutually agree upon the details of the project. This is an excellent opportunity to learn current laboratory techniques, data analysis, laboratory notebook maintenance and presentation skills. Literature-based projects may also be available in which the student will be required to identify a research question and meet with the supervisor at regular intervals for discussion and guidance on preparation of a term paper and poster presentation. Prerequisites: PMCOL 343 and 344. Available only to students in the Pharmacology Specialization program or students who are granted

Proposed

PMCOL 402-

Title
Pharmacology Tutorial

Course Career Undergraduate

Units 3

Approved Hours 0-0-8

Fee index 6

Faculty Medicine and Dentistry

Department Pharmacology

Typically Offered second term

Description

The student will carry out an individual research project in a laboratory under the supervision of a member of the Department of Pharmacology. Supervision by Professors from other Departments may be possible, provided that a sponsor from the Department of Pharmacology is identified and the project is relevant to the discipline of Pharmacology. Students must secure a supervisor before registration. The course offers formal opportunity to gain hands-on experience and develop skills within a research laboratory setting. Students will have a chance to become familiar with good lab practices, develop critical thinking, evaluation and troubleshooting skills, while applying their knowledge to practical research questions. Completion of this course requires a written report of the project and a presentation to an examining committee. Restricted to Pharmacology Specialization students or

consent by the Department of Pharmacology.	Honor students in Stream B in the fourth year of their program. Registration must be approved by the Department of Pharmacology. Please contact the course coordinator for registration in the course.
--	--

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 20, 2022
FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.
Departmental approval- Sep 9, 2022

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Pharmacology
Contact Person:	Dr James R Hammond
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

The description of the course was modified to reflect the following changes:

- The course will be offered to both Specialization students AND Honor students in the Stream B
- Student supervision by Professors from other Departments would be possible, provided that a sponsor from the Department of Pharmacology is identified.
- Students are asked to secure a supervisor before registration. Guidelines to help students to find a supervisor will be added to the Departmental website.
- The language of the description, and the expected number of hours per week, will be more consistent with other PMCOL research courses

Course Template

Current	Proposed
PMCOL 403 -	PMCOL 403 -
Title Advanced Topics in Pharmacology	Title Advanced Topics in Pharmacology
Course Career Undergraduate	Course Career Undergraduate
Units 3	Units 3
Approved Hours 4-3S-4	Approved Hours 0-0-8
Fee index 6	Fee index 6
Faculty Medicine and Dentistry	Faculty Medicine and Dentistry
Department Pharmacology	Department Pharmacology
Typically Offered either term	Typically Offered either term
Description This course is designed to allow students to explore current topics and issues in pharmacology via projects such as literature reviews, systematic reviews, and community outreach and service. Under the guidance of a Faculty member, students will be expected to explore the current literature surrounding their topic of interest and will also be provided with selected readings by the supervisor. Prerequisites: PMCOL 303, PMCOL 305,	Description This course is designed to allow students to explore current topics and issues in pharmacology via projects such as critical literature reviews, simulated grant applications, community outreach and service projects. Before registration students must secure a supervisor from the Department of Pharmacology who will guide them through the course. Supervision by Professors from other

<p>PMCOL 343, PMCOL 344 or consent of instructor. This course will normally be restricted to students in the Pharmacology Specialization or Honors Programs. Students should consult the Department regarding the availability of projects.</p>	<p>Departments may be possible, provided that a sponsor from the Department of Pharmacology is identified and the project is relevant to the discipline of Pharmacology. Successful completion of a written report and a presentation is required at the conclusion of the project. Restricted to Pharmacology Specialization students or Honor students in Stream B in the fourth year of their program. Honors students in Stream B should consider enrolling in this course if they wish to focus within a singular Pharmacology topic but without the hands-on/lab experience. Prerequisites: PMCOL 303, PMCOL 306, PMCOL 343, PMCOL 344 or consent of instructor. Please contact the course coordinator for registration in the course.</p>
---	--

Reviewed/Approved by:

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 20, 2022 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates. Departmental approval- Sep 9, 2022</p>

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Department of Pharmacology
Contact Person:	Dr James R Hammond
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	Winter 2024

Rationale

The changes proposed for Year 4 of the Pharmacology Honors BSc program includes the creation of two research streams with different course requirements. The rationale for establishing the two streams is presented in detail in the proposal for program changes. The proposed Research Stream A (Undergraduate Honors Thesis in Pharmacology) involves 12 units in independent study and research to be performed in the laboratory of a single faculty member in the Department of Pharmacology, culminating in the development of an undergraduate honors research thesis. These two new courses (PMCOL 497 and PMCOL 499) are designed to fulfill the requirements for Research Stream A. It is important that PMCOL 497 is independent of PMCOL 499, so students who find difficulties in the course have the option to complete PMCOL 497 in the fall semester and are not forced to continue in PMCOL499. Students are not able to take PMCOL 499 only. The two courses have different learning outcomes. In PMCOL 497 students are expected to develop and write a proposal, learn the methodology and to start the experimental work. In PMCOL 499 students will continue their research and produce a written honors thesis on their project. We will also require students to take at least one of PMCOL 301 or 302, or have equivalent laboratory research experience, as a prerequisite for registering in PMCOL 497. Students interested in pursuing graduate studies and possibly an academic career will benefit from the more intense research opportunities offered in this Research Stream. Moreover, supervisors will be able to develop more significant, in-depth projects for the students. Research courses with this structure in the fourth year of study has been proven extremely successful in honor programs comparable to Pharmacology, namely Physiology and Neuroscience.

Course Template

New course 	Proposed PMCOL 497 - Title Honors Research Project in Pharmacology I Course Career Undergraduate Units 6 Approved Hours 0-0-16 Fee index 12 Faculty Medicine and Dentistry Department Pharmacology Typically Offered first term
---	---

	<p>Description Individual research project open to undergraduate Pharmacology Honor students (Stream A) who have identified a supervisor in the Department of Pharmacology. Normally taken in conjunction with PMCOL 499, this 6-credit course is the first part of a 12-credit program in two terms resulting in an honors research thesis in Pharmacology. During PMCOL497 students will develop background knowledge in an area of pharmacology research within the supervisor's expertise, design an experimental plan (in conjunction with their supervisor) to investigate a particular research question, learn the methodologies to be used, and begin experiments to answer this research question. Completion of this course requires a written proposal summarizing background information and experimental design and methods for the project, as well as an oral presentation to an examining committee. Students aiming for Graduate School should consider taking this course as it embraces the research process from developing the research question, to planning the experimental design, collecting and analyzing data, writing a final paper, and presenting research findings. Prerequisite: PMCOL 303, PMCOL 306, PMCOL 343, PMCOL 344, and PMCOL 301 or PMCOL 302 or documented summer student research experience. Please contact the course coordinator for registration in the course.</p>
--	---

<p>New course</p>	<p>Proposed</p> <p>PMCOL 499 -</p> <p>Title Honors Research Project in Pharmacology II</p> <p>Course Career Undergraduate Units 6 Approved Hours 0-0-16 Fee index 12 Faculty Medicine and Dentistry Department Pharmacology Typically Offered second term</p> <p>Description Individual research project open to undergraduate Pharmacology Honor students (Stream A) who have identified a supervisor in the Department of Pharmacology. Taken in conjunction with PMCOL497,</p>
--------------------------	--

	<p>this 6-credit course is the second part of a 12-credit program in two terms resulting in an honors research thesis in Pharmacology. Upon satisfactory progress in the first term, PMCOL 499 students will continue their research and produce a written honors thesis on their project. An oral presentation and thesis defense will occur at the end of term and be evaluated. Registration must be approved by the Department of Pharmacology. Prerequisite: PMCOL497 and consent of the Department of Pharmacology.</p>
--	---

Reviewed/Approved by:

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 20, 2022 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022</p>
--

<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates. Departmental approval- Sep 9, 2022</p>
--

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – Oncology
Contact Person:	Jen Freund 780-432-8477, jen.freund@ualberta.ca Or Dr. Alan Underhill, underhil@ualberta.ca
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

We would like to expand the scope of the existing course, ONCOL 425, to be able to offer a new related course, ONCOL 525, as well. The undergraduate level course will still be offered, it is the graduate component that is new. This will increase the options of graduate level courses for our students and will also increase the enrollment in the course, which will hopefully also lead to more robust discussion to benefit the students.

This is similar to a couple of other courses in our department Oncol 424/524 and 475/575 which have both undergraduate and graduate offerings.

Current calendar wording is [here](#).

Course Template

Current	Proposed
NEW COURSE	ONCOL 525 - Advanced Topics in Cancer Research Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index VAR Faculty Medicine and Dentistry Department Oncology Typically Offered second term
	Description This course provides an in-depth analysis of selected topics in cancer research. The course features three modules, each covering a different area of cancer research. Modules 1 - 3 and Modules 4 - 6 will be offered in alternate years. Each module is comprised of 8 sessions of 80 min each, with each module taught as an independent unit. Modules have both lecture and group discussion components. Lectures are the same as for ONCOL 425, but with additional

	assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in ONCOL 425. Prerequisite: CELL 201/BIOL 201 and a 300 level science course in BIOCH, GENET, ONCOL, CELL or consent of the Department.
--	---

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – July 15, 2022 FoMD Faculty Council (for information/suggestions/challenges) – Aug 25, 2022
--

Approved by Cancer Sciences Graduate Coordinating Committee on June 8, 2022.
--



Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD - Dentistry¶¶	
Contact Person:	Melanie Grams melanie.grams@ualberta.ca¶¶	
Level of change (choose one only) [?]	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
For which term will this change take effect?	Fall 2024	

Rationale

DDS 829 is no longer required as candidates are admitted to the second year of the Advanced Placement program. This additional year of study eliminated the need for this course.¶¶

Course Template

Current	Proposed
Removed language	New language
DDS 829—Introduction to DDS Advanced Placement¶¶	DELETE

Course Career Undergraduate¶¶	
Units 12¶¶	
Approved Hours 3-0-0¶¶	
Fee index 38¶¶	
Faculty Medicine and Dentistry¶¶	
Department Dentistry¶¶	
Typically Offered Spring/Summer¶¶	
¶¶	
Description¶¶	
Students begin studying all phases of clinical dentistry including diagnosis and treatment planning, anaesthesia, periodontics, endodontics, operative dentistry, prosthodontics and orthodontics. Students receive an introduction to ethics in dentistry. Students perform tasks	

<p>mainly in a pre-clinical (laboratory) environment and have a brief introduction to the clinic with limited diagnosis and treatment of patients. Offered at an increased rate of fee assessment; refer to the Tuition and Fees page in the University Regulations section of the Calendar. Restricted to candidates registered as Special Students in the DDS Advanced Placement Program.</p>	
---	--

¶

Reviewed/Approved by: ¶

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 15, 2022 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.¶</p>

¶

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD - Dentistry	
Contact Person:	melanie.grams@ualberta.ca	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2024	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	no	

Rationale

The admissions process for the DDS Advanced Placement Program has required the National Dental Examining Board of Canada's (NDEB) Assessment of Fundamental Knowledge (AFK) results as an admissions criteria. The NDEB has changed the protocol for reporting AFK Examination results, from percentile to Pass-Fail reporting. No further breakdown of results is available to programs. As such the AFK results will no longer allow for initial ranking of applicants for further participation in the School of Dentistry's Pre-Entry Examination. The American Dental Association's (ADA) Advanced Dental Admission Test (ADAT) is designed to provide dental education programs with an assessment of applicant's potential for success in advanced dental education. The ADAT tests foundational knowledge in biomedical, and clinical sciences as well as data/research interpretation and evidence-based dentistry. As applicant qualifications for advanced placement programs can vary substantially, the use of an assessment criteria measure such as the ADAT provides a standardized assessment. This calendar change reflects the need for the DDS Advanced Placement Program admissions selections process to have a standardized knowledge test that both provides a measure similar to what existed previously (the AFK), and mirrors the Dental Aptitude Test (DAT) which is taken by applicants for the DDS Program.

Calendar Copy

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11300#dds-advanced-placement-program>

Current	Proposed
<p>DDS Advanced Placement Program</p> <p>For detailed application and program information please visit www.dentistry.ualberta.ca.</p> <p>Limitation of Enrolment: Enrolment is limited.</p> <p>Because the number of candidates who meet the minimum requirements for admission far exceeds the quota, it should be understood that eligibility does not guarantee admission. Admission is determined on a competitive basis.</p> <p>Admission Requirements</p> <p>In order to be eligible to apply to the DDS Advanced Placement program applicants must:</p> <ol style="list-style-type: none"> 1. Be graduates of a minimum four-year University dental program, not recognized by the Commission on Dental Accreditation of Canada (CDAC) or the Joint Commission for Dental Accreditation of the American Dental Association (JCDA). 2. Have successfully completed the Assessment of Fundamental Knowledge (AFK) sponsored by the National Dental Examining Board of Canada (NDEB) within five years prior to the application deadline. For information on the NDEB Equivalency Process or to register for the exam please visit www.ndeb.ca. 3. Letter/s from Licensing Bodies: Applicants who are or have been licensed to practice dentistry in any jurisdiction must submit letters of good standing (in English) from current and previous licensing bodies. 4. Language Proficiency Requirements: All applicants must meet the English Language Proficiency and Spoken English requirements (see Language Proficiency 	<p>DDS Advanced Placement Program</p> <p>For detailed application and program information please visit www.dentistry.ualberta.ca.</p> <p>Limitation of Enrolment: Enrolment is limited.</p> <p>Because the number of candidates who meet the minimum requirements for admission far exceeds the quota, it should be understood that eligibility does not guarantee admission. Admission is determined on a competitive basis.</p> <p>Admission Requirements</p> <p>In order to be eligible to apply to the DDS Advanced Placement program applicants must:</p> <ol style="list-style-type: none"> 1. Be graduates of a minimum four-year University dental program, not recognized by the Commission on Dental Accreditation of Canada (CDAC) or the Joint Commission for Dental Accreditation of the American Dental Association (JCDA). 2. Have successfully completed the Advanced Dental Admission Test (ADAT), provided through the American Dental Association, within five years prior to the application deadline. For information on the ADAT or to register for the exam visit www.ada.org. The latest the test may be written is August, one year prior to admission. If the test is taken more than once the best set of scores will be used. The deadline date for submitting ADAT results to the Admissions Office is November 1 of the year preceding admission being sought. 3. Letter/s from Licensing Bodies: Applicants who are or have been licensed to practice dentistry in any jurisdiction must submit letters of good standing (in English) from current and previous licensing bodies. 4. Language Proficiency Requirements: All applicants must meet the English Language Proficiency and Spoken English requirements (see Language Proficiency

Requirements).

5. **Citizenship:** Applicants must be Canadian citizens or Permanent Residents of Canada on or before the deadline date for applications. A notarized copy of proof of Canadian citizenship or Permanent Resident status must be submitted with the application for admission.
6. **Pre-Entry Examination:** Applicants who are considered to have potential based on their application documents and **AFK results** may qualify for the Pre-Entry Examination. Prior to the examination, a nonrefundable Pre-Entry Examination fee will be required from each applicant. **Upon successful completion of the Pre-Entry Examination, applicants will qualify to proceed to the Introduction to DDS Advanced Placement (DDS 829).**
- ~~7. **Introduction to DDS Advanced Placement:** Nonrefundable course fees plus mandatory fees for equipment or materials owned or leased is required from each applicant. Refer to www.dentistry.ualberta.ca for detailed information.~~
8. **Medical Testing and Immunization Requirements:** Please see [University Infectious Diseases Regulation](#).
9. **Final Selection:** Applicant profiles are made up primarily of results of the **Assessment of Fundamental Knowledge sponsored by the National Dental Examining Board of Canada (NDEB); Language Proficiency/Spoken English results, Pre-Entry Examination results, and successful completion of the Introduction to Advanced Placement course (DDS 829).**
As admission into the program is limited, the Admissions Committee has the responsibility of selecting those applicants who demonstrate promise to successfully complete the program. The Admissions Committee reserves the right to use its judgement with respect to individual cases. The decision concerning admission is final.

Requirements).

5. **Citizenship:** Applicants must be Canadian citizens or Permanent Residents of Canada on or before the deadline date for applications. A notarized copy of proof of Canadian citizenship or Permanent Resident status must be submitted with the application for admission.
6. **Pre-Entry Examination:** Applicants who are considered to have potential based on their application documents and **ADAT results** may qualify for the Pre-Entry Examination. Prior to the examination, a nonrefundable Pre-Entry Examination fee will be required from each applicant.
7. **Medical Testing and Immunization Requirements:** Please see [University Infectious Diseases Regulation](#).
8. **Final Selection:** Applicant profiles are made up primarily of results of the **ADAT, Language Proficiency/Spoken English results, and Pre-Entry Examination results.**

As admission into the program is limited, the Admissions Committee has the responsibility of selecting those applicants who demonstrate promise to successfully complete the program. The Admissions Committee reserves the right to use its judgement with respect to individual cases. The decision concerning admission is final. No appeal mechanism exists.

No appeal mechanism exists.

- 10. Police Information Checks:** Applicants should be aware that a clear Police Information Check (PIC) is required as a condition of admission and that any criminal charges pending must be declared. Under the *Protection for Persons in Care Act*, all students going to any clinical placement or rotation in Alberta are required to complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. The clinical practice site will determine the criteria for acceptance/denial of a placement. Police Information Checks are due at the **beginning of the Introduction to Advanced Placement course (DDS 829)**. Applicants should plan to have their PIC completed prior to an offer of admission. Students who have concerns related to their ability to provide a clear Police Information Check should consult with the Department of Dentistry. The ultimate responsibility for ensuring that students meet the requirements of clinical agencies lies with the students. Other background checks may be required by a clinical agency, such as a child intervention record check. Students will be advised if any additional background checks are required by a clinical agency. See [Requirement for Police Information Checks](#) and [Protection for Persons in Care](#) for more information on the general requirements concerning Police Information Checks and the fees associated with them.

- 11. Completion of Indigenous Canada Massive Open Online Course (MOOC):** Admitted applicants should be aware that as a condition of admission, and prior to Orientation, they must provide **a certificate** of completion of the University of Alberta Faculty of Native Studies Indigenous Canada MOOC.

- 12. National Dental Examining Board of**

- 9. Police Information Checks:** Applicants should be aware that a clear Police Information Check (PIC) is required as a condition of admission and that any criminal charges pending must be declared. Under the *Protection for Persons in Care Act*, all students going to any clinical placement or rotation in Alberta are required to complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. The clinical practice site will determine the criteria for acceptance/denial of a placement.

Police Information Checks are due at the **time admission is confirmed**. Applicants should plan to have their PIC completed prior to an offer of admission.

Students who have concerns related to their ability to provide a clear Police Information Check should consult with the Department of Dentistry. The ultimate responsibility for ensuring that students meet the requirements of clinical agencies lies with the students. Other background checks may be required by a clinical agency, such as a child intervention record check. Students will be advised if any additional background checks are required by a clinical agency. See [Requirement for Police Information Checks](#) and [Protection for Persons in Care](#) for more information on the general requirements concerning Police Information Checks and the fees associated with them.

- 10. Completion of Indigenous Canada Massive Open Online Course (MOOC):** Admitted applicants should be aware that as a condition of admission, and prior to Orientation, they must provide **verification** of completion of the University of Alberta Faculty of Native Studies Indigenous Canada MOOC.

- 11. National Dental Examining Board of**

<p>Canada (or equivalent) Examinations: In accordance with National Dental Examining Board of Canada (NDEB) regulations, students enrolled in Advanced Placement programs are eligible to take the NDEB exams within three months of their expected date of graduation. For further information, refer to the NDEB by-laws governing examinations and certification eligibility, www.ndeb.ca.</p> <p>13. Deposit: Upon notification of acceptance, successful applicants will be required to confirm their intention to register by submitting a nonrefundable tuition deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.</p>	<p>Canada (or equivalent) Examinations: In accordance with National Dental Examining Board of Canada (NDEB) regulations, students enrolled in Advanced Placement programs are eligible to take the NDEB exams within three months of their expected date of graduation. For further information, refer to the NDEB by-laws governing examinations and certification eligibility, www.ndeb.ca.</p> <p>12. Deposit: Upon notification of acceptance, successful applicants will be required to confirm their intention to register by submitting a nonrefundable tuition deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.</p>
--	--

Reviewed/Approved by:

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 15, 2022 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Nursing
Contact Person:	Daniel Jin, Linda Youell
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
For which term will this change take effect?	May 2023 (Calendar change date July 2022)

Rationale

- Course changes expand the terms courses are offered, as a part of the development of the new [Fast Track Program](#)
- Same rationale as for that program: *“Rationale: We have higher student numbers with a greater demand on clinical agency capacity and clinical instructors. Spreading the Year 3 clinical placement demand across the entire year will allow clinical learning when there is greater capacity for clinical units and instructors. Clinical agencies are very supportive of having students year round.*
- *Students have indicated interest in a fast track model that allows them to graduate and begin their nursing career sooner. Our Student Advisory Committee has registered its support. This model also facilitates progress for out of sequence students. We had a popular fast track option for 4th year students in an earlier curriculum.”*
- *Additionally, INT D 420 will have its corequisite wording updated to reflect its addition to both regular and Fast track programs.*

Course Template

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404434	
<p>NURS 321 - Advanced Acute Care Nursing Practice I</p> <hr/> <p>Course Career Undergraduate Units 6 Approved Hours 1-144C-2</p>	<p>NURS 321 - Advanced Acute Care Nursing Practice I</p> <hr/> <p>Course Career Undergraduate Units 6 Approved Hours 1-144C-2</p>

Fee index 12
Faculty Nursing
Department Nursing
Typically Offered first term

Description

This acute care practicum builds on the concepts and intentional clinical learning from NURS 221/SC INF 221 and NURS 225. The focus is on integrating prior learning to move towards providing comprehensive patient and family centered care and socialization to the role of the nurse in an acute care setting. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404435

NURS 323 - Community Nursing through the Lifespan

Course Career Undergraduate
Units 6
Approved Hours 2-144C-2
Fee index 12
Faculty Nursing

Fee index 12
Faculty Nursing
Department Nursing
Typically Offered Variable

Description

This acute care practicum builds on the concepts and intentional clinical learning from NURS 221/SC INF 221 and NURS 225. The focus is on integrating prior learning to move towards providing comprehensive patient and family centered care and socialization to the role of the nurse in an acute care setting. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

NURS 323 - Community Nursing through the Lifespan

Course Career Undergraduate
Units 6
Approved Hours 2-144C-2
Fee index 12
Faculty Nursing

Department Nursing
Typically Offered **either term**

Description

The course covers theories, ethics and evidence-informed approaches to community health nursing including primary health care, population health, health maintenance and promotion, and disease and injury prevention. It includes exploration of concepts of community-based assessment, planning, intervention and evaluation with community-as-client. The practicum portion of the course includes a variety of community settings. Nursing practice will include health assessment and interventions for clients throughout the lifespan and care continuum. Clinical hours listed are the total number of hours and will be offered over 6 weeks. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404436

**NURS 325 -
Advanced Acute
Care Nursing**

Department Nursing
Typically Offered **Variable**

Description

The course covers theories, ethics and evidence-informed approaches to community health nursing including primary health care, population health, health maintenance and promotion, and disease and injury prevention. It includes exploration of concepts of community-based assessment, planning, intervention and evaluation with community-as-client. The practicum portion of the course includes a variety of community settings. Nursing practice will include health assessment and interventions for clients throughout the lifespan and care continuum. Clinical hours listed are the total number of hours and will be offered over 6 weeks. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

**NURS 325 -
Advanced Acute
Care Nursing**

Practice II

Course Career Undergraduate
Units 6
Approved Hours 0-192C-2
Fee index 12
Faculty Nursing
Department Nursing
Typically Offered **second term**

Description

The course provides opportunities for participants to integrate, consolidate, and expand concepts from previous learning to advance their professional nursing practice. Participants have the opportunity to consolidate learning and advance their clinical decision-making in a variety of acute care settings. Course includes 128 clinical hours total. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisite: NURS 321.

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404437

NURS 327 - Mental Health and Wellness in

Practice II

Course Career Undergraduate
Units 6
Approved Hours 0-192C-2
Fee index 12
Faculty Nursing
Department Nursing
Typically Offered **Variable**

Description

The course provides opportunities for participants to integrate, consolidate, and expand concepts from previous learning to advance their professional nursing practice. Participants have the opportunity to consolidate learning and advance their clinical decision-making in a variety of acute care settings. Course includes 128 clinical hours total. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisite: NURS 321.

NURS 327 - Mental Health and Wellness in

Nursing

Course Career Undergraduate
Units 6

Approved Hours 2-144C-2

Fee index 12

Faculty Nursing

Department Nursing

Typically Offered **either term**

Description

This course in mental health provides opportunities to acquire knowledge, skills, and attitudes to promote wellness, through safe, ethical nursing practice, in a variety of contexts. The focus will be mental well-being throughout the lifespan.

Learning experiences will provide students an understanding of the mental health nursing process. Clinical hours listed are the total number of hours and will be offered over 6 weeks. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404445

**NURS 425 -
Nursing Leadership**

Nursing

Course Career Undergraduate
Units 6

Approved Hours 2-144C-2

Fee index 12

Faculty Nursing

Department Nursing

Typically Offered **Variable**

Description

This course in mental health provides opportunities to acquire knowledge, skills, and attitudes to promote wellness, through safe, ethical nursing practice, in a variety of contexts. The focus will be mental well-being throughout the lifespan.

Learning experiences will provide students an understanding of the mental health nursing process. Clinical hours listed are the total number of hours and will be offered over 6 weeks. Note: Available only to nursing students in the Collaborative/Honors Program or Bilingual Program. Prerequisites: NURS 216, NURS 224, and NURS 225.

**NURS 425 -
Nursing Leadership**

in a Focus Area

Course Career Undergraduate

Units 6

Approved Hours 2-192C-0

Fee index 12

Faculty Nursing

Department Nursing

Typically Offered variable

Description

This leadership experience provides opportunity to consolidate prior learning and develop confidence and competence as students prepare to transition to the role of the Registered Nurse. The focus is on collaboration with interprofessional teams, systems thinking, and healthcare system change. Students evaluate the influence of evidence, policy and legislation on decision-making in complex health systems using a relational practice lens. Students demonstrate and enhance their own relational capacity as leaders and innovators for 21st Century Canadian healthcare. Fieldwork hours listed are the total number of hours and will be offered over 12 weeks. Prerequisites: All courses in the program except NURS 422 and NURS 485. Corequisite: NURS 422

in a Focus Area

Course Career Undergraduate

Units 6

Approved Hours 2-192C-0

Fee index 12

Faculty Nursing

Department Nursing

Typically Offered variable

Description

This leadership experience provides opportunity to consolidate prior learning and develop confidence and competence as students prepare to transition to the role of the Registered Nurse. The focus is on collaboration with interprofessional teams, systems thinking, and healthcare system change. Students evaluate the influence of evidence, policy and legislation on decision-making in complex health systems using a relational practice lens. Students demonstrate and enhance their own relational capacity as leaders and innovators for 21st Century Canadian healthcare. Fieldwork hours listed are the total number of hours and will be offered over 12 weeks. Prerequisites: All courses in the program except NURS 422, INT D 420 and NURS 485. Corequisites: NURS 422

and INT D 420

https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404444

NURS 422 - Contemporary Issues in Healthcare Ethics and Law

Course Career Undergraduate

Units 3

Approved Hours 3-0-0

Fee index 6

Faculty Nursing

Department Nursing

Typically Offered either term or
Spring/Summer

NURS 422 - Contemporary Issues in Healthcare Ethics and Law

Course Career Undergraduate

Units 3

Approved Hours 3-0-0

Fee index 6

Faculty Nursing

Department Nursing

Typically Offered either term or
Spring/Summer

<p>Description</p> <p>The course examines a range of ethical theories, relevant research, and approaches to ethical decision-making to critically debate real world problems in health care. Students will develop an understanding of health law and health care ethics and of the relationship between law and ethics. Note: Available only to nursing students in the Collaborative/Honors Program, After Degree/After Degree Honors Program or RPN-BScN Program. Prerequisite for students in the Collaborative/Honors and After Degree/After Degree Honors Programs: NURS 400. Corequisite: NURS 425.</p>	<p>Description</p> <p>The course examines a range of ethical theories, relevant research, and approaches to ethical decision-making to critically debate real world problems in health care. Students will develop an understanding of health law and health care ethics and of the relationship between law and ethics. Note: Available only to nursing students in the Collaborative/Honors Program, After Degree/After Degree Honors Program or RPN-BScN Program. Prerequisite for students in the Collaborative/Honors and After Degree/After Degree Honors Programs: NURS 400. Corequisites: NURS 425 and INT D 420.</p>
<p>https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=404455</p>	
<p>NURS 485 - Nursing Practice in a Focused Area</p> <hr/> <p>Course Career Undergraduate</p> <p>Units 12</p>	<p>NURS 485 - Nursing Practice in a Focused Area</p> <hr/> <p>Course Career Undergraduate</p> <p>Units 12</p>

<p>Approved Hours 2-350C-1</p> <p>Fee index 24</p> <p>Faculty Nursing</p> <p>Department Nursing</p> <p>Typically Offered variable</p> <p>Description</p> <p>The course provides an opportunity to consolidate learning and preparation to assume the role of BScN graduate via a preceptored clinical experience. The area of focus may be a particular setting of practice, client population, or health challenge or trend. It provides opportunities to demonstrate the integration of prior learning through the development of a comprehensive care planning assignment. The preceptorship is designed in collaboration with faculty and is based on practicum area availability. Course includes 350 clinical hours total. Prerequisites: All courses in the program except NURS 422/SC INF 422 or PHILE 386 and NURS 425/SC INF 425.</p>	<p>Approved Hours 2-350C-1</p> <p>Fee index 24</p> <p>Faculty Nursing</p> <p>Department Nursing</p> <p>Typically Offered variable</p> <p>Description</p> <p>The course provides an opportunity to consolidate learning and preparation to assume the role of BScN graduate via a preceptored clinical experience. The area of focus may be a particular setting of practice, client population, or health challenge or trend. It provides opportunities to demonstrate the integration of prior learning through the development of a comprehensive care planning assignment. The preceptorship is designed in collaboration with faculty and is based on practicum area availability. Course includes 350 clinical hours total. Prerequisites: All courses in the program except NURS 422 or PHILE 386, NURS 425 or SC INF 425, and INT D 420.</p>
<p>https://calendar.ualberta.ca/preview_course_nopop.php?catoid=36&coid=451265</p>	

INT D 420 - Perspectives on Inclusive and Global Health

Course Career Undergraduate

Units 3

Approved Hours 3-0-0

Fee index 6

Faculty Nursing

Department Nursing

Typically Offered either term or
Spring/Summer

Description

This course will provide opportunities for students to develop a deeper, more situated, understanding of the guiding

INT D 420 - Perspectives on Inclusive and Global Health

Course Career Undergraduate

Units 3

Approved Hours 3-0-0

Fee index 6

Faculty Nursing

Department Nursing

Typically Offered either term or
Spring/Summer

Description

This course will provide opportunities for students to develop a deeper, more situated, understanding of the guiding

principles that underpin equity, diversity, and inclusion (EDI) in the global context. In line with the United Nations Sustainable Development Goals (SDGs), the students will recognize the key issues related to EDI in global health including global citizenship, a sense of social justice; environmental, social, economic and political global challenges; agency; intersectionality (ethnicity, gender, patriarchy, power relationships) and an appreciation for cultural diversity. Prerequisites: All courses in the program except NURS 422, NURS 425 and NURS 485. Corequisites NURS 422 and 425, SC INF 425 and PHILE 386.

principles that underpin equity, diversity, and inclusion (EDI) in the global context. In line with the United Nations Sustainable Development Goals (SDGs), the students will recognize the key issues related to EDI in global health including global citizenship, a sense of social justice; environmental, social, economic and political global challenges; agency; intersectionality (ethnicity, gender, patriarchy, power relationships) and an appreciation for cultural diversity. Prerequisites: All courses in the program except NURS 422, NURS 425 and NURS 485. Corequisites NURS 422 and NURS 425, or PHILE 386 and SC INF 425.

Reviewed/Approved by:

REQUIRED: Executive Committee (for Faculty Council) April 29, 2022; University Governance: PST,

Undergraduate Curriculum Committee April 12, 2022; Faculty Caucus April 25 & 26, 2022

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Rehabilitation Medicine
Contact Person:	Patricia (Trish) Manns
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
Type of change request (check all that apply) [?]	<input checked="" type="checkbox"/> Program <input type="checkbox"/> Regulation
For which term is this intended to take effect?	For immediate implementation
Does this proposal have corresponding course changes? (Should be submitted at the same time)	no

Rationale

At present, calendar language does not provide clarity regarding course requirements in the PhD program, if the student has completed our MSc. Rehab Science program. With the joint instruction of Rehab 512/600 we have created a situation where a student in the PhD program would theoretically take the same course again to fulfill the requirements of the PhD program (i.e., as the requirements stated in the calendar). Clarification of course requirements for students who complete a MSc Rehab Science and then enroll in the PhD Rehab Science program is needed.

A small wording change has been proposed to clarify the length of the program.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42418&returnto=11393

Current

The PhD in Rehabilitation Science (PhD RS) program provides training for future rehabilitation scientists who seek to discover, integrate, and apply knowledge to improve the health and wellness of people with health conditions and disabilities. Interested applicants will include clinicians in the professions of rehabilitation medicine (occupational therapy, physical therapy, speech-language pathology, and audiology) and physical medicine (physiatry and orthopedics), as well as other related fields (e.g., biomechanical and electrical engineers with special interests in rehabilitation technologies and assistive devices, kinesiologists).

Proposed

The PhD in Rehabilitation Science (PhD RS) program provides training for future rehabilitation scientists who seek to discover, integrate, and apply knowledge to improve the health and wellness of people with health conditions and disabilities. Interested applicants will include clinicians in the professions of rehabilitation medicine (occupational therapy, physical therapy, speech-language pathology, and audiology) and physical medicine (physiatry and orthopedics), as well as other related fields (e.g., biomechanical and electrical engineers with special interests in rehabilitation technologies and assistive devices, kinesiologists).

Program Requirements

Students are required to complete a minimum of ★18 in coursework and a thesis.

Coursework

- REHAB 600 - Theory and Issues in Rehabilitation Science
- REHAB 601 - Research Design in Rehabilitation Science
- REHAB 603 - Seminars in Rehabilitation Science
- REHAB 606 - Essentials for Graduate Studies
- One ★3 research analysis graduate-level course in research analysis
- At least two ★3 graduate-level elective courses
 - Elective courses will be based on the student's research interests and selected in consultation with supervisory committee.
- In cases where a student has not written a master's thesis before entering the PhD program (e.g., course based master's program, medical degree program), REHAB 899 (★3) is required, as an in-lieu-of thesis project.
 - This requirement may be waived if the final/capstone project is considered by the Rehabilitation Science Graduate Program Committee to be an "equivalent piece of publishable research to offer in lieu". Requests to waive the in lieu of thesis requirement must be received no later than the end of the first term of study.
- Students and their supervisors will develop a plan of study for the entire program and submit that plan of study for approval by the Rehabilitation Science Graduate Program Committee.

Program Requirements

Students are required to complete a minimum of ★18 in coursework and a thesis.

- In the case of transfer into the PhD from the MSc program (prior to completing the MSc), a minimum of ★3 beyond the requirements for the MSc degree (★15) must be completed for a minimum total of ★18.
- A minimum of ★12 is required when the applicant already holds an MSc degree in a relevant discipline from a recognized institution.

Coursework

- REHAB 600 - Theory and Issues in Rehabilitation Science
- REHAB 601 - Research Design in Rehabilitation Science
- REHAB 603 - Seminars in Rehabilitation Science
- REHAB 606 - Essentials for Graduate Studies
- One ★3 research analysis graduate-level course in research analysis
- At least two ★3 graduate-level elective course
 - Elective courses will be based on the student's research interests and selected in consultation with the supervisory committee.
- In cases where a student has not written a master's thesis before entering the PhD program (e.g., course based master's program, medical degree program), REHAB 899 (★3) is required, as an in-lieu-of thesis project.
 - This requirement may be waived if the final/capstone project is considered by the Rehabilitation Science Graduate Program Committee to be an "equivalent piece of publishable research to offer in lieu". Requests to waive the in lieu of thesis requirement must be received no later than the end of the first term of study.
- When the student has completed a MSc of Rehabilitation Science at the University of Alberta, they will be granted an exception and will not take Rehab 600 as part of their 12 credit course requirement, as long as Rehab 512 was successfully completed as part of the

Length of Program

The time required to complete the PhD program will vary according to the previous training of the applicant and the nature of the research undertaken. In general, the PhD program will take a minimum of three years to complete, held within two years of a student's entry into the doctoral program.

The maximum time to complete the PhD program as set by the Faculty of Graduate Studies and Research is six years.

Removed language

student's MSc course work at the University of Alberta.

- Students and their supervisors will develop a plan of study for the entire program and submit that plan of study for approval by the Rehabilitation Science Graduate Program Committee.

Length of Program

The time required to complete the PhD program will vary according to the previous training of the applicant and the nature of the research undertaken. In general, the PhD program will take a minimum of three years to complete. The maximum time to complete the PhD program as set by the Faculty of Graduate Studies and Research is six years.

Reviewed/Approved by:

Discussion and approval at Rehab Science Graduate Program Committee (January 13, 2022)
Consultation during Lunch and Learn held with Faculty members (Feb 8, 2022).
FRM Executive Committee - for Discussion March 2022
FRM Executive Committee - Approved April 27, 2022
FRM Faculty Council - Approved May 18, 2022
GPST - Jun 6, 2022 (forwarded to PRC)



Date of FRM Faculty Council Meeting

May 18, 2022

Issue (Agenda Title)

MScOT Program Regulation Calendar Change - Admission Deadline Change

Presenter

Mary Roduta Roberts & Shaniff Esmail

Action Required: Discussion **Approval/Motion**

MOTION (*if applicable*): To approve the program admission deadline from February 1st to January 31st, 11:59 pm MST.

Executive Summary:

The due date has always been January 31st, 11:59 pm MST. If it is listed as February 1st the students think they have all of February 1st to submit their application, which they do not.

ATTACHMENTS:

MScOT Program Regulation Calendar Change

Engagement and Routing:

- November 23, 2021 - OT Department Council for approval
- January 26, 2022 - FRM Executive Committee for approval
- May 18, 2022 - FRM Faculty Council for approval (Approved)

CALENDAR CHANGE REQUEST FORM

Department: Occupational Therapy [2022-2023]

Highlight type of change request below:


1. **Course Change** 2. **Editorial Change** 3. **Admission Requirement** 4. **Program Regulation**

CURRENT	PROPOSED
The deadline for receipt of applications for the entry-level stream is February 4 for September admission. Contact the Department for application deadline information on the postprofessional stream.	The deadline for receipt of applications for the entry-level stream is January 31st at 11:59 pm MST for September admission. Contact the Department for application deadline information on the postprofessional stream.

Rationale for change: (Not required for course deletion or editorial changes)

The due date has always been Jan 31st, 11:59 pm MST. If it is listed as Feb 1st the students think they have all of Feb 1st to submit their application, which they do not.

All names, signatures and dates are required:

Department Contact Name: Priya Swamy	Department Chair or Designate Name: Mary Roduta Roberts	Date approved by Dept Council: November 23, 2021
Email: pswamy@ualberta.ca	Signature: 	Date Submitted: November 24, 2021

Email a signed PDF and an editable word version to pswamy@ualberta.ca



Date of FRM Faculty Council Meeting

May 18, 2022

Issue (Agenda Title)

OT Entrance Requirement Change

Presenter

Shaniff Esmail

Action Required:

Discussion

Approval/Motion

MOTION (*if applicable*): To approve the proposed calendar changes that states:

“With the exception of pre-requisite courses, only senior level courses taken extra to the degree will be included in the admission GPA.”

“A minimum Academic IELTS overall score of 7.5, with at least 7.0 on each band.”

Executive Summary:

Given the competitive nature of the MScOT Program, and the GPA calculation on the most recent ★60 some applicants have taken numerous 100 level courses to boost their GPA providing an unfair advantage over applicants completing their degrees. Since the intent is that the GPA calculation is typically for courses in the last two years of a degree courses extra to degree should be taken at an equivalent level.

Our language requirements for applicants whose first language is not English are based on FGSR’s minimum requirements. Setting a higher level of language proficiency will better position applicants whose first language is not English for success within the MScOT program. Comparable health professional programs have set higher levels of language proficiency. Therefore, we are increasing the minimum scores for IELTS. The Pearson English Language Test is not commonly used by applicants for Canadian postsecondary institutions and will be removed from the calendar.

The MScOT postprofessional stream is dormant with the last cohort of students admitted in 2017. Information regarding application deadlines for the postprofessional stream should be removed from the calendar.

ATTACHMENTS:

MScOT Entrance Requirement Calendar Change

Engagement and Routing:

- April 14, 2022 - OT Department Council for approval
- April 27, 2022 - FRM Executive Committee for approval
- May 18, 2022 - FRM Faculty Council for approval(Approved)

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Occupational Therapy
Contact Person:	Priya Swamy
Level of change (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
Type of change request (check all that apply) [?]	<input checked="" type="checkbox"/> Program <input checked="" type="checkbox"/> Regulation
For which term is this intended to take effect?	For admission in to Fall 2023 Academic Year
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No

Rationale

Given the competitive nature of the MScOT Program, and the GPA calculation on the most recent ★60 some applicants have taken numerous 100 level courses to boost their GPA providing an unfair advantage over applicants completing their degrees. Since the intent is that the GPA calculation is typically for courses in the last two years of a degree courses extra to degree should be taken at an equivalent level.

Our language requirements for applicants whose first language is not English are based on FGSR's minimum requirements. Setting a higher level of language proficiency will better position applicants whose first language is not English for success within the MScOT program. Comparable health professional programs have set higher levels of language proficiency. Therefore, we are increasing the minimum scores for IELTS. The Pearson English Language Test is not commonly used by applicants for Canadian postsecondary institutions and will be removed from the calendar.

The MScOT postprofessional stream is dormant will the last cohort of students admitted in 2017. Information regarding application deadlines for the postprofessional stream should be removed from the calendar.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42634&returnto=11393

Current

~~Removed language~~

Entrance requirements

Activity courses in Physical Education, studio/performance courses in Fine Arts, practicum courses, pass/fail courses and seminar/research/thesis/ individual studies courses are not considered part of the required 60 units of admission requirements and are not included in the calculation of the admission GPA.

One Statistics course (3 units) and one human anatomy course (3 units), completed within the last ten years, by June 30th of the admission year are required prerequisites. Students may find it to their advantage to have taken a human physiology course prior to entering the program.

Where applicable, applicants must provide proof of English Language Proficiency (refer to [English Language Requirement](#)). Any one of the following is acceptable:

- a minimum TOEFL score of 100 with a score of at least 25 on each of the individual skill areas (Internet-based), or equivalent;
- ~~a minimum Academic IELTS overall score of 6.5, with at least 6.0 on each band;~~
- ~~a minimum PTE Academic overall score of 61.~~

All applicants are also required to submit the following:

- a curriculum vitae in a pre-set format (available for download with the Online Application for Graduate Admission),
- two letters of recommendation,
- a description/evidence of suitability for this program and profession.

In addition, applicants are required to complete an online situational judgment test as part of the application package.

The deadline for receipt of applications for the entry-level stream is February 1 for September admission. ~~Contact the Department for application deadline information on the~~

Proposed

New language

With the exception of pre-requisite courses, courses completed extra to degree must be undergraduate senior level (typically 300 and 400 level)

- a minimum TOEFL score of 100 with a score of at least 25 on each of the individual skill areas (Internet-based), or equivalent;
- a minimum Academic IELTS overall score of 7.5, with at least 7.0 on each band;

postprofessional stream.

All components of the application package will be considered in the admission decision. Outstanding applicants will be recommended for early acceptance. The remaining applicants will be advised of their status by June 30 of the admission year

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.

April 14, 2022 - Occupational Therapy Department Council for approval

April 27, 2022 - FRM Executive Committee for approval

May 18, 2022 - FRM Faculty Council for approval (Approved)

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Rehabilitation Medicine/Department of Physical Therapy
Contact Person:	Priya Swamy
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
Type of change request (check all that apply) [?]	<ul style="list-style-type: none"> • Program • Regulation
For which term is this intended to take effect?	Fall 2023
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No

Rationale

The COVID pandemic has prevented most applicants from obtaining volunteer experience and has been waived for three cycles of applicants, without any significant immediate impact. It also reduces barriers for students unable to volunteer.

Given the competitive nature of the MScPT Program, and the GPA calculation on the most recent ★60, some applicants have taken numerous 100 level courses to boost their GPA providing an unfair advantage over applicants completing their degrees. Since the intent is that the GPA calculation is typically for courses in the last two years of a degree courses extra to degree should be taken at an equivalent level. There is an exception for pre-requisite courses as we are looking for broad introductory content and many of those courses are offered at a 100 or 200 level. These courses would be included in GPA calculation if taken in the most recent 60 credits.

Most Canadian graduates demonstrate English language competence by completing an undergraduate degree and typically complete an English course in their first year; international applicants must meet English language proficiency requirements. Removing the English course requirement reduces the number of prerequisite courses for applicants and decreases the administrative burden of verifying English courses.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=34&poid=38400&returnto=10333

Current	Proposed
<p>Physical Therapy [Graduate] [...]</p> <p>Entrance Requirements [...]</p> <p>Prerequisite courses are required and include the following: Human Anatomy (★3), Human Physiology (★6), Human Movement (★3), English (★3), Statistics (★3), Human Psychology (★3) and Humanities or Social Sciences (★3) – for examples see Programs and Certificates.</p> <p>A minimum of 30 hours of volunteer or paid work is required. Work must include direct contact involving interaction with persons with cognitive or physical disabilities at no more than two facilities. Applicants are required to submit a letter from the primary work supervisor verifying the volunteer/paid work experience.</p>	<p>Physical Therapy [Graduate] [...]</p> <p>Entrance Requirements [...]</p> <p>Prerequisite courses are required and include the following: Human Anatomy (★3), Human Physiology (★6), Human Movement (★3), Statistics (★3), Human Psychology (★3) and Humanities or Social Sciences (★3) – for examples see Programs and Certificates.</p> <p>With the exception of pre-requisite courses, courses completed extra to degree must be senior undergraduate level (typically 300 and 400 level) courses.</p>

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.</p>
<p>MScPT Admissions Committee - 24 February 2022 Physical Therapy Department Council - 4 March 2022 FRM Executive Committee (discussion) - 30 March 2022 FRM Executive Committee (approval) - 27 April 2022 FRM Faculty Council (approval) – 18 May 2022</p> <p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

Calendar Change Request Form for Course Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Campus Saint-Jean
Contact Person(s):	Marie Simuong/Anne Boerger
Level of change (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
For which term will this change take effect?	Winter 2023

Rationale

The course listing of the CSJ courses needs to be updated. Accordingly, the following courses are to be deleted:

- SC PO 261 (Relations internationales I):This course has been replaced by SC PO 263 (Introduction à la politique mondiale).
- SC PO 262 (Relations internationales II) and SOCIE 369 (Sociologie de la mondialisation) which are now replaced by the co-listed courses SCPO 364 / SOCIE 364 (Mondialisation et Développementt)
- SCSOC 311 (Histoire de la pensée politique et sociale I) et SCSOC 312 (Histoire de la pensée politique et sociale II). They are replaced by SC PO 304 (Pensée politique moderne) et SCPO 305 (Pensée politique contemporaine).

Course Template

CURRENT	PROPOSED
<p>SC PO 261 - Relations internationales I Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Faculté Saint-Jean Department Saint Jean Typically Offered l'un ou l'autre semestre</p> <p>Description Introduction au rôle de l'État au sein du système international ayant pour but de développer une connaissance des événements contemporains internationaux. Ce cours couvre la nature de la politique étrangère et la dynamique d'interaction entre les États. Préalable(s): SC PO 101 ou SC PO 102 ou POL S 101.</p>	<p>Delete</p>

<p>SC PO 262 – Relations internationales II Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Faculté Saint-Jean Department Saint-Jean Typically Offered l'un ou l'autre semestre</p> <p>Description Introduction aux problèmes contemporains de relations internationales ayant pour but de développer une connaissance du système international. Ce cours porte sur le rôle des institutions internationales, des acteurs supra-étatiques et non-étatiques, ainsi que certains enjeux liés à la mondialisation.</p>	<p>Delete</p>
<p>SOCIE 369 – Sociologie de la mondialisation Course Career Undergraduate Units 3 Approved Hours VARIABLE Fee index 6 Faculty Faculté Saint-Jean Department Saint-Jean Typically Offered l'un ou l'autre semestre</p> <p>Description Introduction à l'analyse critique des transformations de l'économie-monde et de leurs impacts économiques, politiques, sociaux et culturels. La mondialisation comme fait social, les acteurs de la mondialisation, les discours pro-anti- et alter-mondialisation. Préalable: SOCIE 100. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SOCIE 269.</p>	<p>Delete</p>
<p>SCSOC 311 – Histoire de la pensée politique et sociale I Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Faculté Saint-Jean Department Saint-Jean Typically Offered l'un ou l'autre semestre</p> <p>Description Survol historique et critique du développement de la pensée politique et sociale, de l'Antiquité à la Renaissance, en utilisant des textes choisis de quelques philosophes présocratiques (Héraclite, Parménide), Platon, Aristote, Boèce, Abélard, Thomas d'Aquin, Machiavel, Erasme.</p>	<p>Delete</p>

<p>SCSOC 312 – Histoire de la pensée politique et sociale II Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Faculté Saint-Jean Department Saint-Jean Typically Offered l'un ou l'autre semestre</p> <p>Description Étude des principaux aspects de la pensée politique et sociale du XVIIe siècle à nos jours, centrée sur l'évolution du libéralisme, de ses différentes tendances et des réactions d'opposition qu'il a suscitées. Seront abordées les œuvres de Hobbes, Locke, Montesquieu, Rousseau, Voltaire, Payne, Adam Smith, Tocqueville, Marx, Weber, Durkheim et Louis Hartz.</p>	<p>Delete</p>
---	----------------------

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date. FSJ Academic Planning Committee : September 22, 2022 FSJ Executive Committee (on behalf of FSJ Faculty Council): Oct 11, 2022 (e-vote)</p>
<p>OPTIONAL: Other internal faculty approving bodies, consultation groups, or departments, and approval dates.</p>

Calendar Change Request Form for Program and Regulation Changes
See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculté Saint-Jean (Faculty of Nursing)
Contact Person:	Marie Simuong/ (Daniel Jin, Faculty of Nursing)
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of change request (check all that apply) [?]	<input checked="" type="checkbox"/> Program <input type="checkbox"/> Regulation
For which term is this intended to take effect?	Fall 2022
Does this proposal have corresponding course changes? (Should be submitted at the same time)	Already previously submitted and approved by Faculty of Nursing.

Rationale

Necessary changes were already approved for Fall 2022 in the Faculty of Nursing Bilingual BScN Calendar page (https://calendar.ualberta.ca/preview_program.php?catoid=36&poiid=42204), these changes apply to the FSJ program page for the same program. Standardizes the wording so that the FSJ site matches the FoN site.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): https://calendar.ualberta.ca/preview_program.php?catoid=36&poiid=42904	
<p>Current</p> <p>Bachelor of Science in Nursing (Bilingual) [Faculté Saint-Jean]</p> <p>Pour la version française, allez sur: Baccalauréat ès sciences infirmières (bilingue)</p> <hr/> <p>General Information</p> <hr/>	<p>Proposed</p> <p>Bachelor of Science in Nursing (Bilingual) [Faculté Saint-Jean]</p> <p>Pour la version française, allez sur: Baccalauréat ès sciences infirmières (bilingue)</p> <hr/> <p>General Information</p> <hr/>

Note: Prospective students must apply for admission to the Faculty of Nursing.

The **BScN (Bilingual) program** is a collaborative effort between the Faculty of Nursing and Faculté Saint-Jean. This program offers students the opportunity to study nursing in Canada's two official languages. It is designed to:

1. Respond to a need expressed by students who wish to obtain a bilingual degree in nursing in Alberta.
2. Offer a program that prepares graduates to provide nursing services in both official languages.
3. Offer a program that better prepares graduates to respond to the needs of the French-speaking communities in Western and Northern Canada.

During their program, students take courses at Faculté Saint-Jean and at the Faculty of Nursing. The total number of nursing courses where the primary language of instruction is French varies from 27 to 47 credits. These courses may include clinical practice in bilingual or francophone settings. In addition, based on academic and clinical performance, and on availability of placements, students may elect to complete the senior practicum in a bilingual or francophone milieu outside of Edmonton.

1. The curriculum is designed to be taken over four years. With approval, students have up to six years from the time of admission to complete requirements for this program. Normally, students who do not complete the program within six years will be required to withdraw.
2. Students are responsible for the completeness and accuracy of their registration. Particular care should be exercised regarding prerequisite courses. Students are responsible for adjustments in registration made necessary by reexamination results.
3. Placements can be made anywhere in the Greater Edmonton area (Devon, Fort Saskatchewan, Leduc, Morinville, St Albert, Sherwood Park, Spruce Grove and Stony Plain) or as far away as 150 kilometers. For clinical courses delivered in English, required practice placements may be as far as 150 kilometres from Edmonton. For clinical courses delivered in French, required practice placements may be as far as 600 kilometres from Edmonton. Students are responsible for their transportation to practice placements and for the cost of travel and accommodations.

Note: Prospective students must apply for admission to the Faculty of Nursing.

The **BScN -Bilingual Program** is a collaborative effort between the Faculty of Nursing and Faculté Saint-Jean. This program offers students the opportunity to study nursing in Canada's two official languages. It is designed to:

1. Respond to a need expressed by students who wish to obtain a bilingual degree in nursing in Alberta.
2. Offer a program that prepares graduates to provide nursing services in both official languages.
3. Offer a program that better prepares graduates to respond to the needs of the French-speaking communities in Western and Northern Canada.

During their program, students take courses at Faculté Saint-Jean and at the Faculty of Nursing. The total number of nursing courses where the primary language of instruction is French varies from 27 to 47 credits. These courses may include clinical practice in bilingual or francophone settings. In addition, based on academic and clinical performance, and on availability of placements, students may elect to complete the senior practicum in a bilingual or francophone milieu outside of Edmonton.

1. The curriculum is designed to be taken over four years. With approval, students have up to six years from the time of admission to complete requirements for this program. Normally, students who do not complete the program within six years will be required to withdraw.
2. Students are responsible for the completeness and accuracy of their registration. Particular care should be exercised regarding prerequisite courses. Students are responsible for adjustments in registration made necessary by reexamination results.
3. Placements can be made anywhere in the Greater Edmonton area (Devon, Fort Saskatchewan, Leduc, Morinville, St Albert, Sherwood Park, Spruce Grove and Stony Plain) or as far away as 150 kilometers. For clinical courses delivered in English, required practice placements may be as far as 150 kilometres from Edmonton. For clinical courses delivered in French, required practice placements may be as far as 600 kilometres from Edmonton. Students are responsible for their transportation to practice placements and for the cost of travel and accommodations.

4. Students must purchase a stethoscope, a penlight, a lab coat and a uniform by the beginning of second year.
5. Clinical practice may include shift and weekend rotations.
6. Students must meet Health and Safety Requirements [see [Health and Safety Requirements](#)].

Course sequence

Year 1

Fall Term

- [ANATE 140 - Anatomie](#)
- [FRANC 224 - Maîtrise du français pour les sciences infirmières](#)
- [MICRE 133 - Microbiologie Médicale pour Infirmières](#)
- [SC INF 110 - Fondements du succès en soins infirmiers](#)
- [SOCIE 100 - Introduction à la sociologie](#)

Fall/Winter

- [PHYSE 152 - Physiologie](#)

Winter Term

- [ANGL 126 - Exploring Writing Studies](#)
- [NURS 125 - Nursing Practice - Health Assessment](#)
- [PSYCE 106 - Principes psychologiques pour les infirmières](#)
- [STATQ 151 - Introduction à la statistique appliquée I](#)

Spring/Summer

- [FRANC 232 - Techniques de rédaction](#) OR
- ANGL ~~1XX~~ (3 units) OR

4. Students must purchase a stethoscope, blood pressure cuff, and a penlight at the time of admission. A uniform will be required later in the program.
5. Clinical practice may include shift and weekend rotations.

Course Sequence

As of September 2022 (see [Faculty of Nursing- Maintaining Registration](#))

Year 1

Fall Term

- [ANATE 140 - Anatomie](#)
- [FRANC 224 - Maîtrise du français pour les sciences infirmières](#)
- [MICRE 133 - Microbiologie Médicale pour Infirmières](#)
- [SC INF 110 - Fondements du succès en soins infirmiers](#)
- [SOCIE 100 - Introduction à la sociologie](#)

Fall/Winter

- [PHYSE 152 - Physiologie](#)

Winter Term

- [ANGL 126 - Exploring Writing Studies](#)
- [NURS 125 - Nursing Practice - Health Assessment](#)
- [PSYCE 106 - Principes psychologiques pour les infirmières](#)
- [STATQ 151 - Introduction à la statistique appliquée I](#)

Spring/Summer

- [FRANC 232 - Techniques de rédaction](#) OR
- ANGL (3 units) OR

- Elective (3 units) (see Note 1)

Year 2 (see Notes 2 and 3)

Fall Term

- [SC INF 205 - L'innovation, le leadership, les politiques et les organisations de soins de santé](#)
- [SC INF 221 - Introduction à la pratique infirmière](#)
- [SC INF 223 - Les fondations des sciences infirmières I/II](#)

Two Term

- [NURS 216 - Pathophysiology and Pharmacology II](#)

Winter Term

- [NURS 224 - Foundations of Nursing III](#)
- [NURS 225 - Introduction to Acute Care Nursing Practice](#)
- [SC INF 301 - Recherche en sciences infirmières](#)

Spring/Summer

- [SCSOC 222 - Santé des Autochtones et conceptions du bien-vivre](#)

Year 3 (see Notes 3, 4 and 5)

Fall Term

- [NURS 321 - Advanced Acute Care Nursing Practice I](#)
- [NURS 323 - Community Nursing through the Lifespan](#)
- [SC PO 320 - La politique du système de santé au Canada](#) (see Note 6)

Winter Term

- Elective (3 units) (see Note 1)

Year 2 (see Notes 2 and 3)

Fall Term

- [SC INF 205 - L'innovation, le leadership, les politiques et les organisations de soins de santé](#)
- [SC INF 221 - Introduction à la pratique infirmière](#)
- [SC INF 223 - Les fondations des sciences infirmières I/II](#)

Two Term

- [NURS 216 - Pathophysiology and Pharmacology II](#)

Winter Term

- [NURS 224 - Foundations of Nursing III](#)
- [NURS 225 - Introduction to Acute Care Nursing Practice](#)
- [SC INF 301 - Recherche en sciences infirmières](#)

Spring/Summer

- [SCSOC 222 - Santé des Autochtones et conceptions du bien-vivre](#)

Year 3 (see Notes 3, 4 and 5)

Fall Term

- [NURS 321 - Advanced Acute Care Nursing Practice I](#)
- [NURS 323 - Community Nursing through the Lifespan](#)
- [SC PO 320 - La politique du système de santé au Canada](#) (see Note 6)

Winter Term

- [NURS 325 - Advanced Acute Care Nursing Practice II](#)
- [NURS 327 - Mental Health and Wellness in Nursing](#) (see Note 6) OR
- [SC INF 327 - Santé mentale et bien-être en soins infirmiers](#)
-
- [NURS 400 - Leadership in Nursing and Interprofessional Practice](#)

Year 4 (see Notes 3, 4, and 8)

Fall Term

- [NURS 485 - Nursing Practice in a Focused Area](#)

Winter Term

- [PHILE 386 - La bioéthique](#) (see Note 6)
- [SC INF 425 - Le leadership en sciences infirmières dans un domaine spécifique](#)

Notes:

1. The language of instruction of all electives must be French and electives are normally taken at Faculté Saint-Jean.
2. To proceed to Year 2 students must have passed all Year 1 courses.
3. "SC INF" denotes nursing courses where French is the primary language of instruction.
4. Courses may be configured differently depending on clinical placement availability.
5. To proceed to Year 3 students must have passed all Year 2 courses.
6. The Faculty of Nursing will determine which course students will take.
7. The Faculty of Nursing will offer this course in French whenever possible. When offered, students in the Bilingual Nursing Program must take this course in French.

- [NURS 325 - Advanced Acute Care Nursing Practice II](#)
- [NURS 327 - Mental Health and Wellness in Nursing](#) (see Note 7) OR
- [SC INF 327 - Santé mentale et bien-être en soins infirmiers](#)
-
- [NURS 400 - Leadership in Nursing and Interprofessional Practice](#)

Year 4 (see Notes 3, 4 and 8)

Fall Term

- [NURS 485 - Nursing Practice in a Focused Area](#) (see Note 9)

Winter Term

- [PHILE 386 - La bioéthique](#) (see Note 6)
- [SC INF 425 - Le leadership en sciences infirmières dans un domaine spécifique](#)
- [INT D 420 - Perspectives on Inclusive and Global Health](#)

Notes:

1. The language of instruction of all electives must be French and electives are normally taken at Faculté Saint-Jean.
2. To proceed to Year 2 students must have passed all Year 1 courses.
3. "SC INF" denotes nursing courses where French is the primary language of instruction.
4. Courses may be configured differently depending on clinical placement availability.
5. To proceed to Year 3 students must have passed all Year 2 courses.
6. The Faculty of Nursing will determine which course students will take.
7. The Faculty of Nursing will offer this course in French whenever possible. When offered, students in the

8. To proceed to Year 4, students must have passed all Year 2 and 3 courses
9. Based on academic and clinical performance, and on availability of placements, students may elect to complete the senior practicum in a bilingual or francophone milieu outside of Edmonton.

URL in current Calendar (or leave blank if it is a new page):
https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42909

Baccalauréat ès sciences infirmières (bilingue)

[Faculté Saint-Jean]

Current

Renseignements généraux

Note : Les étudiantes doivent appliquer directement à la Faculty of Nursing.

Le programme qui prépare au BSInf (bilingue) repose sur la collaboration de la Faculté Saint-Jean et de la Faculty of Nursing. Ce programme permet aux étudiants d'étudier les sciences infirmières dans les deux langues officielles du Canada. Le programme vise les objectifs suivants :

1. Répondre aux besoins des étudiants qui souhaitent obtenir un diplôme bilingue en sciences infirmières en Alberta.

Bilingual Nursing Program must take this course in French.

8. To proceed to Year 4, students must have passed all Year 2 and 3 courses
9. Based on academic and clinical performance, and on availability of placements, students may elect to complete the senior practicum in a bilingual or francophone milieu outside of Edmonton.

URL in current Calendar (or leave blank if it is a new page):
https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42909

Baccalauréat ès sciences infirmières (bilingue)

[Faculté Saint-Jean]

Proposed

Renseignements généraux

Note : Les étudiantes doivent appliquer directement à la Faculty of Nursing.

Le programme qui prépare au BSInf (bilingue) repose sur la collaboration de la Faculté Saint-Jean et de la Faculty of Nursing. Ce programme permet aux étudiants d'étudier les sciences infirmières dans les deux langues officielles du Canada. Le programme vise les objectifs suivants :

1. Répondre aux besoins des étudiants qui souhaitent obtenir un diplôme bilingue en sciences infirmières en Alberta.
2. Offrir un programme qui prépare les diplômés à la prestation des soins infirmiers dans les deux langues officielles.

2. Offrir un programme qui prépare les diplômés à la prestation des soins infirmiers dans les deux langues officielles.
3. Offrir un programme pour bien préparer les diplômés à répondre aux besoins des communautés d'expression française de l'ouest et du nord canadien.

Au cours de leur formation, les étudiants suivent les cours en français à la Faculté Saint-Jean et à la *Faculty of Nursing*. Le nombre total des crédits de cours de sciences infirmières enseignés en français varie de 27 à 47. Ces cours peuvent comprendre des stages de pratique clinique en milieux bilingues ou francophones. De plus, selon la performance académique et clinique, et la disponibilité des stages, les étudiants peuvent choisir de compléter leur stage pratique clinique de niveau senior dans un milieu bilingue ou francophone.

1. Le curriculum est organisé pour permettre la réalisation du programme d'études en quatre années. Si accordée, les étudiants ont jusqu'à six ans, à compter de leur admission, pour compléter les exigences de ce programme. Normalement, les étudiants qui n'auront pas complété le programme en six ans devront se retirer.
2. Les étudiants sont responsables de s'assurer que leur inscription est complète et à jour. Ils doivent être particulièrement attentifs aux préalables de certains cours. Les étudiants sont responsables de tout changement dans leur inscription nécessité par les résultats de réexamens.
3. Les placements seront faits dans la région métropolitaine d'Edmonton, qui comprend Devon, Fort Saskatchewan, Leduc, Morinville, St Albert, Sherwood Park, Spruce Grove et Stony Plain ou dans un rayon de 150 kilomètres d'Edmonton. Pour les cours cliniques qui se donnent en anglais, les placements des stages obligatoires pourraient se situer jusqu'à 150 kilomètres d'Edmonton. Pour les cours cliniques qui se donnent en français, les placements des stages obligatoires pourraient se situer jusqu'à 600 kilomètres d'Edmonton. Les étudiants sont responsables de leur transport aux lieux des stages cliniques et de leurs frais de voyage et de séjour.

3. Offrir un programme pour bien préparer les diplômés à répondre aux besoins des communautés d'expression française de l'ouest et du nord canadien.

Au cours de leur formation, les étudiants suivent les cours en français à la Faculté Saint-Jean et à la *Faculty of Nursing*. Le nombre total des crédits de cours de sciences infirmières enseignés en français varie de 27 à 47. Ces cours peuvent comprendre des stages de pratique clinique en milieux bilingues ou francophones. De plus, selon la performance académique et clinique, et la disponibilité des stages, les étudiants peuvent choisir de compléter leur stage pratique clinique de niveau senior dans un milieu bilingue ou francophone.

1. Le curriculum est organisé pour permettre la réalisation du programme d'études en quatre années. Si accordée, les étudiants ont jusqu'à six ans, à compter de leur admission, pour compléter les exigences de ce programme. Normalement, les étudiants qui n'auront pas complété le programme en six ans devront se retirer.
2. Les étudiants sont responsables de s'assurer que leur inscription est complète et à jour. Ils doivent être particulièrement attentifs aux préalables de certains cours. Les étudiants sont responsables de tout changement dans leur inscription nécessité par les résultats de réexamens.
3. Les placements seront faits dans la région métropolitaine d'Edmonton, qui comprend Devon, Fort Saskatchewan, Leduc, Morinville, St Albert, Sherwood Park, Spruce Grove et Stony Plain ou dans un rayon de 150 kilomètres d'Edmonton. Pour les cours cliniques qui se donnent en anglais, les placements des stages obligatoires pourraient se situer jusqu'à 150 kilomètres d'Edmonton. Pour les cours cliniques qui se donnent en français, les placements des stages obligatoires pourraient se situer jusqu'à 600 kilomètres d'Edmonton. Les étudiants sont responsables de leur transport aux lieux des stages cliniques et de leurs frais de voyage et de séjour.
4. Les étudiants doivent acheter un stéthoscope, un sphygmomanomètre et une lampe stylo au moment de l'admission. Un uniforme sera exigé plus tard dans le programme.

4. Au début de la deuxième année de leur programme, les étudiants doivent disposer d'un stéthoscope, d'un crayon lumineux, d'une blouse de laboratoire, et d'un uniforme.
5. Les horaires des stages cliniques peuvent être attribués par quart de travail et peuvent inclure les fins de semaine.
6. Les étudiants doivent rencontrer les exigences en matière de santé et de sécurité (voir [Health and Safety Requirements](#)).

Séquence des cours

Année 1

Automne

- [ANATE 140 - Anatomie](#)
- [FRANC 224 - Maîtrise du français pour les sciences infirmières](#)
- [MICRE 133 - Microbiologie Médicale pour Infirmières](#)
- [SC INF 110 - Fondements du succès en soins infirmiers](#)
- [SOCIE 100 - Introduction à la sociologie](#)

Automne/Hiver

- [PHYSE 152 - Physiologie](#)

Hiver

5. Les horaires des stages cliniques peuvent être attribués par quart de travail et peuvent inclure les fins de semaine.

Séquence des cours

À partir de Septembre 2022 (voir [Faculty of Nursing- Maintaining Registration](#))

Année 1

Automne

- [ANATE 140 - Anatomie](#)
- [FRANC 224 - Maîtrise du français pour les sciences infirmières](#)
- [MICRE 133 - Microbiologie Médicale pour Infirmières](#)
- [SC INF 110 - Fondements du succès en soins infirmiers](#)
- [SOCIE 100 - Introduction à la sociologie](#)

Automne/Hiver

- [PHYSE 152 - Physiologie](#)

Hiver

-
- [ANGL 126 - Exploring Writing Studies](#)
 - [NURS 125 - Nursing Practice - Health Assessment](#)
 - [PSYCE 106 - Principes psychologiques pour les infirmières](#)
 - [STATQ 151 - Introduction à la statistique appliquée I](#)

Printemps/Été

- [FRANC 232 - Techniques de rédaction](#) **OU**
- [ANGL 1XX \(3 crédits\)](#) **OU**
- Option libre (3 crédits) (voir Notes 1)

Année 2 (voir Notes 2 et 3)

Automne

- [SC INF 205 - L'innovation, le leadership, les politiques et les organisations de soins de santé](#)
- [SC INF 221 - Introduction à la pratique infirmière](#)
- [SC INF 223 - Les fondations des sciences infirmières I/II](#)

Deux trimestres

- [NURS 216 - Pathophysiology and Pharmacology II](#)

Winter Term

- [NURS 224 - Foundations of Nursing III](#)

- [ANGL 126 - Exploring Writing Studies](#)
- [NURS 125 - Nursing Practice - Health Assessment](#)
- [PSYCE 106 - Principes psychologiques pour les infirmières](#)
- [STATQ 151 - Introduction à la statistique appliquée I](#)

Printemps/Été

- [FRANC 232 - Techniques de rédaction](#) **OU**
- [ANGL \(3 crédits\)](#) **OU**
- Option libre (3 crédits) (voir Notes 1)

Année 2 (voir Notes 2 et 3)

Automne

- [SC INF 205 - L'innovation, le leadership, les politiques et les organisations de soins de santé](#)
- [SC INF 221 - Introduction à la pratique infirmière](#)
- [SC INF 223 - Les fondations des sciences infirmières I/II](#)

Deux trimestres

- [NURS 216 - Pathophysiology and Pharmacology II](#)

Winter Term

- [NURS 224 - Foundations of Nursing III](#)
- [NURS 225 - Introduction to Acute Care Nursing Practice](#)

- [NURS 225 - Introduction to Acute Care Nursing Practice](#)
- [SC INF 301 - Recherche en sciences infirmières](#)

Spring/Summer

- [SCSOC 222 - Santé des Autochtones et conceptions du bien-vivre](#)

Année 3 (voir Notes 3, 4 et 5)

Automne

- [NURS 321 - Advanced Acute Care Nursing Practice I](#)
- [NURS 323 - Community Nursing through the Lifespan](#)
- [SC PO 320 - La politique du système de santé au Canada](#) (voir Note 6)

Hiver

- [NURS 325 - Advanced Acute Care Nursing Practice II](#)
- [NURS 400 - Leadership in Nursing and Interprofessional Practice](#)
-
- [NURS 327 - Mental Health and Wellness in Nursing](#) **OR**
- [SC INF 327 - Santé mentale et bien-être en soins infirmiers](#) (voir Note 7)

Année 4 (voir Notes 3, 4, et 8)

- [SC INF 301 - Recherche en sciences infirmières](#)

Spring/Summer

- [SCSOC 222 - Santé des Autochtones et conceptions du bien-vivre](#)

Année 3 (voir Notes 3, 4 et 5)

Automne

- [NURS 321 - Advanced Acute Care Nursing Practice I](#)
- [NURS 323 - Community Nursing through the Lifespan](#)
- [SC PO 320 - La politique du système de santé au Canada](#) (voir Note 6)

Hiver

- [NURS 325 - Advanced Acute Care Nursing Practice II](#)
- [NURS 400 - Leadership in Nursing and Interprofessional Practice](#)
-
- [NURS 327 - Mental Health and Wellness in Nursing](#) **OR**
- [SC INF 327 - Santé mentale et bien-être en soins infirmiers](#) (voir Note 7)

Année 4 (voir Notes 3, 4 et 8)

Automne

- [NURS 485 - Nursing Practice in a Focused Area](#) (voir Note 9)

Hiver

- [PHILE 386 - La bioéthique](#) (voir Note 6)
- [SC INF 425 - Le leadership en sciences infirmières dans un domaine spécifique](#)

Notes :

1. ~~Dépendant du résultat du test de placement, la Faculté Saint-Jean déterminera parmi les trois options suivantes, celle que devra choisir l'étudiant.~~
2. La langue d'enseignement des cours optionnels est le français et l'étudiant doit choisir normalement cette option libre parmi les cours offerts en français à la Faculté Saint-Jean.
3. L'étudiant doit réussir tous les cours de l'année 1 avant de pouvoir s'inscrire dans l'année 2.
4. La langue d'enseignement des cours avec le sigle SC INF est le français.
5. Dans la mesure du possible, ce cours sera offert par la Faculty of Nursing en français. Quand il est offert en français, les étudiants inscrits dans le programme bilingue en sciences infirmières doivent suivre le cours en français.
6. La Faculty of Nursing déterminera quel cours les étudiants prendront.
7. L'étudiant doit réussir tous les cours de l'année 2 avant de pouvoir s'inscrire dans l'année 3.
8. La séquence de ces cours peut varier dépendant de la disponibilité des stages cliniques.
9. L'étudiant doit réussir tous les cours de l'année 2 et 3 avant de pouvoir s'inscrire dans l'année 4.

Automne

- [NURS 485 - Nursing Practice in a Focused Area](#) (voir Note 9)

Hiver

- [PHILE 386 - La bioéthique](#) (voir Note 6)
- [SC INF 425 - Le leadership en sciences infirmières dans un domaine spécifique](#)
- [INT D 420 - Perspectives on Inclusive and Global Health](#)

Notes :

1. La langue d'enseignement des cours optionnels est le français et l'étudiant doit choisir normalement cette option libre parmi les cours offerts en français à la Faculté Saint-Jean.
2. L'étudiant doit réussir tous les cours de l'année 1 avant de pouvoir s'inscrire dans l'année 2.
3. La langue d'enseignement des cours avec le sigle SC INF est le français.
4. La séquence de ces cours peut varier dépendant de la disponibilité des stages cliniques.
5. L'étudiant doit réussir tous les cours de l'année 2 avant de pouvoir s'inscrire dans l'année 3.
6. La Faculty of Nursing déterminera quel cours les étudiants prendront.
7. Dans la mesure du possible, ce cours sera offert par la Faculty of Nursing en français. Quand il est offert en français, les étudiants inscrits dans le programme bilingue en sciences infirmières doivent suivre le cours en français.
8. L'étudiant doit réussir tous les cours de l'année 2 et 3 avant de pouvoir s'inscrire dans l'année 4.
9. Dépendant de la performance académique et clinique et la disponibilité des stages, l'étudiant peut choisir de

<p>10. Dépendant de la performance académique et clinique et la disponibilité des stages, l'étudiant peut choisir de compléter le stage pratique avancé dans un milieu bilingue ou francophone à l'extérieur d'Edmonton.</p>	<p>compléter le stage pratique avancé dans un milieu bilingue ou francophone à l'extérieur d'Edmonton.</p>
--	--

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date.</p> <p>FSJ Executive committee (e-vote) on behalf of FSJ Council: August 31, 2022 FSJ Academic Planning Committee: August 25, 2022</p>
<p>OPTIONAL: Other internal faculty approving bodies, consultation groups, or departments, and approval dates.</p> <p>Faculty of Nursing (Linda Youell, Director, Undergraduate Programs) has been consulted.</p>

**BIOLOGICAL SCIENCES
COURSE CHANGE TEMPLATE**

SECTION A: COURSE INFORMATION

CURRENT calendar description	PROPOSED calendar description
<p>BIOL 365—Methods in Freshwater Ecology ★ 3 (n 6)(FIRST, 1-0-3) A practical course introducing students to techniques used in the field and lab to biomonitor lakes and streams. Topics covered will include plankton production and composition, fish and benthos community structure, herbivory and predation, and paleolimnology. The laboratory component includes field trips and independent research projects. Pre or corequisite: BIOL 364 or permission of instructor.</p>	<p>Move course to reserve list.</p>

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (4) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table.

SECTION B: RATIONALE

Removal of specific field courses that have not been offered regularly was a recommendation of the Quality Assurance review of our program. The topic of Methods in Freshwater Ecology can be offered under the umbrella course of BIOL 395-Field Course in Biology.

SECTION C: 1) PEOPLE CONSULTED (e.g., Ecology course instructors). 2) APPROVAL DOCUMENTATION (e.g., summary of email vote, comments from peers).

All ecologists were consulted on this approach and those who responded (n=4) were in favour of this approach. The former instructor of the course was in favour of this approach.

SECTION D: RECOMMENDATION (FOR DEPARTMENT USE)

**Do Any Issues or
Information Gaps
Remain?**

*(The department will list any issues or information gaps that remain following
consultation with the proposing institution.)*

Recommendation(s):

Reviewer

Date Completed

**BIOLOGICAL SCIENCES
COURSE CHANGE TEMPLATE**

SECTION A: BIOL 381 - A Planet in Crisis

CURRENT calendar description	PROPOSED calendar description
<p>This course examines how humankind's collective activities, including altering the climate, have significantly affected the natural planetary balance. We will discuss human population growth and unsustainable resource use; the movement of pollutants through the atmosphere, hydrosphere and biosphere; the impacts these stressors have on ecosystem services and human health; and how certain impacts have been and can be mitigated by environmental policies and laws. Groups of students will produce a short video documentary on a topic related to how humans impact their environment. Prerequisite: BIOL 208.</p>	<p>This course examines how humankind's collective activities, including altering the climate, have significantly affected the natural planetary balance. We will discuss human population growth and unsustainable resource use; the movement of pollutants through the atmosphere, hydrosphere and biosphere; the impacts these stressors have on ecosystem services and human health; and how certain impacts have been and can be mitigated by environmental policies and laws. Prerequisite: BIOL 208.</p>

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (4) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table.

SECTION B: RATIONALE

The change simply eliminates any reference to any specific assignment in the description of the course. Assignments can be changed year after year and depending on the instructor that is teaching the course. I was the instructor for the course in F2021 and I did not include the video assignment and replaced it with a different assignment.

SECTION C: 1) PEOPLE CONSULTED (e.g., Ecology course instructors). 2) APPROVAL DOCUMENTATION (e.g., summary of email vote, comments from peers).

Feedback from students and one previous sessional instructor for BIOL 381. The video assignment discouraged in the past some students from enrolling in the course. Before the start of the course, I received emails from students asking specifically about the video (group) assignment. Once I made the syllabus available and it was clear that there was no video assignment, there was an increase in student registrations. I believe the number of students enrolled in BIOL 381 in F2021 was a bit higher than previous year. The mention of the video in the description doesn't prevent the instructor from changing the assignment but it might discourage some students from enrolling in the course in the first place.

SECTION D: RECOMMENDATION (FOR DEPARTMENT USE)	
Do Any Issues or Information Gaps Remain?	<i>(The department will list any issues or information gaps that remain following consultation with the proposing institution.)</i>
Recommendation(s):	
Reviewer	
Date Completed	

**BIOLOGICAL SCIENCES
COURSE CHANGE TEMPLATE**

SECTION A: COURSE INFORMATION

CURRENT calendar description	PROPOSED calendar description
<p>BIOL 395- FIELD COURSE IN BIOLOGY ★3 (fi 6) (EITHER, 3-0-3)</p> <p>Faculty of Science</p> <p>Covers special topics of current interest in biology pertaining specifically to field opportunities. This course will be held outside of Edmonton at an off-campus location either domestically or internationally, and may require additional on-campus coursework. Prerequisite: second year Biological Sciences course and permission of instructor. Credit for this course may be obtained more than once.</p>	<p>BIOL 395- FIELD COURSE IN BIOLOGY ★3 (fi 6) (EITHER, <u>VARIABLE</u>)</p> <p>Faculty of Science</p> <p>Covers special topics of current interest in biology pertaining specifically to field opportunities. This course <u>may</u> be held outside of Edmonton at <u>one or more</u> off-campus location<u>s</u> either domestically or internationally, and may require additional on-campus coursework. <u>This course requires payment of additional miscellaneous fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. See departmental website for BIOL 395 offered sections.</u> Prerequisite: second year Biological Sciences course and permission of instructor. Credit for this course may be obtained more than once.</p>

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (4) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table.

SECTION B: RATIONALE

Changes are being made to the description of BIOL 395 to more accurately reflect how the course will be taught by a variety of instructors. Course instruction approaches will vary, although there will be a large field component to any section of BIOL 395 that is offered. Changes have been made to permit field courses to be based in Edmonton, as well as outside Edmonton at other locations(s). There has been addition of wording to inform students of additional fees that will be charged as part of this course.

SECTION C: 1) PEOPLE CONSULTED (e.g., Ecology course instructors). 2) APPROVAL DOCUMENTATION (e.g., summary of email vote, comments from peers).

Ecologists in the Department of Biological Sciences were polled for their position on the changes to this description and the use of BIOL 395 as an umbrella course. Those that responded (n=4) were in favour of this approach.

SECTION D: RECOMMENDATION (FOR DEPARTMENT USE)

**Do Any Issues or
Information Gaps
Remain?**

*(The department will list any issues or information gaps that remain following
consultation with the proposing institution.)*

Recommendation(s):

Reviewer

Date Completed

**BIOLOGICAL SCIENCES
COURSE CHANGE TEMPLATE**

SECTION A: COURSE INFORMATION

CURRENT calendar description	PROPOSED calendar description
<p>BIOL 432—Field Methods in Ecology ★ 3 (first 0-0-6) Design, execution, analysis, and presentation of problems in behavioral, population, and community ecology in a field environment. Field exercises, demonstration of techniques, and data collection for independent projects will take place during the two weeks preceding the Fall term at a field station off the main campus. Final reports are due in the last week of September. Prerequisites: BIOL 331 or 332 or ZOO 371 or BOT 332; a statistics course such as STAT 151 or SCI 151, BIOL 330 or 430. This course requires payment of additional miscellaneous fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p>	<p>Move course to reserve list.</p>

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (4) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table.

SECTION B: RATIONALE

Removal of specific field courses that have not been offered regularly was a recommendation of the Quality Assurance review of our program. The topic of Field Methods in Ecology can be offered under the umbrella course of BIOL 395-Field Course in Biology.

SECTION C: 1) PEOPLE CONSULTED (e.g., Ecology course instructors). 2) APPROVAL DOCUMENTATION (e.g., summary of email vote, comments from peers).

All ecologists were consulted on this approach and those who responded (n=4) were in favour of this approach. There is not a current instructor for this course.

SECTION D: RECOMMENDATION (FOR DEPARTMENT USE)	
Do Any Issues or Information Gaps Remain?	<i>(The department will list any issues or information gaps that remain following consultation with the proposing institution.)</i>
Recommendation(s):	
Reviewer	
Date Completed	

**BIOLOGICAL SCIENCES
COURSE CHANGE TEMPLATE**

SECTION A: COURSE INFORMATION

CURRENT calendar description	PROPOSED calendar description
<p>BOT 322—Field Botany ★ 3 (fi 6)(FIRST, 3-0-3) Lectures, laboratory, and field exercises provide an introduction to description and identification of plants and their local habitats. Factors affecting variation in natural vegetation and methods used to describe it are discussed. Field exercises and projects take place during the two weeks preceding the fall term and some may take place off campus. Presentations take place during the first four weeks of class time in September. Prerequisites: BIOL 108 or SCI 100 and any 200-level Biology course. (BOT 321 is strongly recommended). May not be taken for credit if credit already obtained in BOT 304. Offered in alternate years. This course requires payment of additional miscellaneous fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar.</p>	<p>Move course to reserve list.</p>

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike-through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (+) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table.

SECTION B: RATIONALE

Removal of specific field courses that have not been offered regularly was a recommendation of the Quality Assurance review of our program. The topic of Field Botany can be offered under the umbrella course of BIOL 395-Field Course in Biology.

SECTION C: 1) PEOPLE CONSULTED (e.g., Ecology course instructors). 2) APPROVAL DOCUMENTATION (e.g., summary of email vote, comments from peers).

All ecologists were consulted on this approach and those who responded (n=4) were in favour of this approach.

SECTION D: RECOMMENDATION (FOR DEPARTMENT USE)	
Do Any Issues or Information Gaps Remain?	<i>(The department will list any issues or information gaps that remain following consultation with the proposing institution.)</i>
Recommendation(s):	
Reviewer	
Date Completed	

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

1. Course Change
(new course, change to existing course, course deletion)

2. Editorial Change
(basic editing)

3. Admission Requirement

4. Program Change

CURRENT	PROPOSED
<p>https://calendar.ualberta.ca/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=36&expand=&navoid=11383&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter</p>	
<p>CHEM 211 - Quantitative Analysis I</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p> <p>Description Principles, methods, and experimental applications emphasizing solution phase equilibria, titrimetry, volumetric laboratory skills, evaluation of experimental data, and experimental applications of electrochemistry. Includes examples of organic and inorganic analysis. Prerequisite: CHEM 102.</p>	<p>CHEM 211 - Quantitative Analysis I</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p> <p>Description Principles, methods, and experimental applications emphasizing solution phase equilibria, titrimetry, volumetric laboratory skills, evaluation of experimental data, and applications of electrochemistry to analytical measurements. Includes examples of organic and inorganic analyses. Prerequisite: CHEM 102.</p>
<p>CHEM 213 - Quantitative Analysis II</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description A continuation of CHEM 211 emphasizing the principles, methods, and experimental applications of separation techniques, and atomic and molecular spectrometry, and evaluation of experimental data. Includes examples of organic and inorganic analysis and use of the analytical literature. Prerequisite: CHEM 211. Students who have previously taken CHEM 313 may not take CHEM 213 for credit.</p>	<p>CHEM 213 - Quantitative Analysis II</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description A continuation of CHEM 211 emphasizing the principles, methods, and experimental applications of separation techniques, atomic and molecular optical spectrometry, mass spectrometry, and evaluation of experimental data. Includes examples of organic and inorganic analyses and use of the analytical literature. Prerequisite: CHEM 211. Students who have previously taken CHEM 313 may not take CHEM 213 for credit.</p>
<p>CHEM 241 - Introduction to Inorganic Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p>	<p>CHEM 241 - Introduction to Inorganic Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p>

<p>Description The chemistry of main-group elements including a survey of the structure, bonding, and reactivity of their compounds. Transition-metal chemistry will be introduced. The course will include applications in industrial, biochemical, environmental, and materials science. Students who have obtained credit for CHEM 331 cannot take CHEM 241 for credit. Prerequisites: CHEM 102 or 105 and CHEM 161 or 164 or 261.</p>	<p>Description The chemistry of main-group elements including a survey of the structure, bonding, and reactivity of their compounds. Transition-metal chemistry will be introduced. The course will include applications in industrial, biochemical, environmental, and materials science. Prerequisites: CHEM 102 or 105 and CHEM 261.</p>
<p>CHEM 261 - Organic Chemistry I</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description The correlation of structure and chemical bonding in carbon compounds with the physical properties and chemical reactivity of organic molecules. Discussion will be based on functional groups with emphasis on hydrocarbons and derivatives that contain halogens, oxygen, sulfur, and the hydroxy group. Introduction to stereochemistry, three dimensional structure, reaction mechanisms, especially addition to double bonds, nucleophilic substitution and elimination reactions. Prerequisite CHEM 101 or 103. Note: Students who have obtained credit for CHEM 161 or 164 cannot take CHEM 261 for credit. Engineering students who take this course will receive *4.5.</p>	<p>CHEM 261 - Organic Chemistry I</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description The correlation of structure and chemical bonding in carbon compounds with the physical properties and chemical reactivity of organic molecules. Discussion will be based on functional groups with emphasis on hydrocarbons and derivatives that contain halogens, oxygen, sulfur, and the hydroxy group. Introduction to stereochemistry, three dimensional structure, reaction mechanisms, especially addition to double bonds, nucleophilic substitution and elimination reactions. Prerequisite CHEM 101 or 103. Note: Students who have obtained credit for CHEM 264 cannot take CHEM 261 for credit. Engineering students who take this course will receive *4.5.</p>
<p>CHEM 263 - Organic Chemistry II</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Continuation of the structural and chemical properties of the basic functional groups of organic compounds including alkynes, aromatic compounds, aldehydes, ketones, carboxylic acids and their derivatives and amines. Illustration of these functional groups in natural products such as carbohydrates, amino acids and proteins, nucleic acids and lipids. Discussion of the application of spectroscopic methods for the structure determination in simple organic molecules. Prerequisites: CHEM 161 or CHEM 164 or CHEM 261 or CHEM 264 and 266 or SCI 100. Note: Students who have obtained credit for CHEM 163 cannot take CHEM 263 for credit.</p>	<p>CHEM 263 - Organic Chemistry II</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Continuation of the structural and chemical properties of the basic functional groups of organic compounds including alkynes, aromatic compounds, aldehydes, ketones, carboxylic acids and their derivatives and amines. Illustration of these functional groups in natural products such as carbohydrates, amino acids and proteins, nucleic acids and lipids. Discussion of the application of spectroscopic methods for the structure determination in simple organic molecules. Prerequisites: CHEM 261 or CHEM 264 and 266 or SCI 100. Students who have obtained credit for CHEM 265 cannot take CHEM 263 for credit.</p>
<p>CHEM 282 - Atomic and Molecular Structure</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description An introduction to the quantum view of nature with applications to atomic and molecular structure. Methods to describe the quantum world are introduced, used to describe simple electronic, vibrational and rotational structure of model systems, and applied to the hydrogen atom, many-electron atoms, simple diatomic molecules, and the electronic structure of polyatomic molecules. The laboratory portion of the course consists of practical applications enriching and illustrating the lecture material, and incorporates the use of computers as a routine aid to processing experimental results. Prerequisites: CHEM 102 or 105; one 200-level CHEM course; MATH 115 or 136 or 146 and PHYS 124 or 144. Corequisite: PHYS 146 if PHYS 144 presented as a prerequisite instead of PHYS 124.</p>	<p>CHEM 282 - Atomic and Molecular Structure</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description An introduction to the quantum view of nature with applications to atomic and molecular structure. Methods to describe the quantum world are introduced, used to describe the electronic structure of simple model systems, and applied to the hydrogen atom, many-electron atoms, simple diatomic molecules, and polyatomic molecules. The laboratory portion of the course consists of applications enriching and illustrating the lecture material, and incorporates the use of computers in predicting experimental results. Prerequisites: CHEM 102 or 105; one 200-level CHEM course; MATH 115 or 136 or 146, MATH 125, PHYS 124 or 144. Corequisite: PHYS 146 if PHYS 144 presented as a prerequisite instead of PHYS 124.</p>
<p>CHEM 305 - Environmental Chemistry II</p> <hr/>	<p>CHEM 305 - Environmental Chemistry II</p> <hr/>

<p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description The lecture and laboratory portions of this course will highlight sorption and phase partitioning; hydrolysis reactions; convective/diffusive transport; properties and behaviour of particles, including sedimentation, coagulation, and light scattering; and the significance of particulate matter in the atmosphere. Quantitative calculations will be emphasized. The lecture component will provide theoretical background for experiments and instrumentation used for chemical measurements. The course also includes an independent, student-designed air quality monitoring project. Prerequisites: CHEM 263; CHEM 213 or 313; CHEM 303 or 373. Note: Restricted to students in the Environmental Physical Sciences and Chemistry (Honors, Specialization, and General Science with concentration in Chemistry) programs.</p>	<p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description The lecture and laboratory portions of this course will highlight sorption and phase partitioning; hydrolysis reactions; convective/diffusive transport; properties and behaviour of particles, including sedimentation, coagulation, and light scattering; and the significance of particulate matter in the atmosphere. Quantitative calculations will be emphasized. The lecture component will provide theoretical background for experiments and instrumentation used for chemical measurements. The course also includes an independent, student-designed air quality monitoring project. Prerequisites: CHEM 263 or 265; CHEM 213; CHEM 303 or 373. Note: Restricted to students in concentration in Chemistry programs or by consent of instructor.</p>
---	--

<p>CHEM 313 - Instrumentation in Chemical Analysis</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p> <p>Description Instrumentation and analytical applications of spectroscopic, chromatographic and electroanalytical methods are discussed and applied in the laboratory. Prerequisites: CHEM 213 and PHYS 124 or 144. PHYS 126 or 146 is recommended.</p>	<p>CHEM 313 - Instrumentation in Chemical Analysis</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-4 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p> <p>Description A continuation of CHEM 213 delving more deeply into advanced concepts in chemical instrumentation including separations, mass spectrometry, optical spectroscopy and electrochemistry. Concepts of signals, electronics, and data interpretation are also explored and applied in the laboratory. Prerequisites: CHEM 213 and PHYS 124 or 144. PHYS 126 or 146 is recommended.</p>
---	--

<p>CHEM 398 - Molecular Spectroscopy</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-1s-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description An integrated course in the quantitative and more advanced aspects of spectroscopy and its applications in chemistry. The subjects may include: absorption, emission, dichroism, vibrational and rotational spectroscopy of molecules; time-resolved spectroscopy; nuclear magnetic resonance spectroscopy; surface-specific spectroscopies. Prerequisites: CHEM 282.</p>	<p>CHEM 398 - Molecular Spectroscopy</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-2 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description An integrated course in the quantitative and more advanced aspects of spectroscopy and its applications in chemistry. The subjects may include: absorption, emission, dichroism, vibrational and rotational spectroscopy of molecules; time-resolved spectroscopy; nuclear magnetic resonance spectroscopy; surface-specific spectroscopies. A virtual molecular spectroscopy laboratory is included that incorporates the use of computers in predicting spectra and interpreting experimental results. Lab meetings will run for 6 – 8 weeks throughout the term. Prerequisite: CHEM 282.</p>
---	--

<p>CHEM 451 - Chemical Biology</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Introduction to the methods used to analyze and manipulate biological systems using engineered biomolecules and synthetic organic molecules. Topics may include biomolecule structure and function, enzymology, molecular biology, protein engineering, genome engineering, bioinformatic methods, inhibitor design, library screening methods, fluorescent probes, bioorthogonal chemistry, and various chemical biology methods. Prerequisites: BIOCH 200 and CHEM 361 (can be taken as co-requisite).</p>	<p>CHEM 451 - Chemical Biology</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Advanced methods used to analyze and manipulate biological systems using engineered biomolecules and synthetic organic molecules. Topics may include biomolecule structure and function, enzymology, molecular biology, protein engineering, genome engineering, bioinformatic methods, inhibitor design, library screening methods, fluorescent probes, bioorthogonal chemistry, and various chemical biology methods. Prerequisites: CHEM 351 or BIOCH 200; CHEM 361 (can be taken as co-requisite).</p>
---	---

<p>CHEM 454 - Bioconjugate Chemistry</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Discussion of organic reactions to modify or label biopolymers including proteins, carbohydrates, and nucleic acids. Topics will include mechanistic and methodological details of commonly employed reactions used for chemoselective labeling or modification of biomolecules to produce synthetic vaccines, antibody-drug conjugates, and native chemical ligation will be discussed. Prerequisites: CHEM 361 and BIOCH 200, or consent of instructor. Note: This course may not be taken for credit if credit has already been received in CHEM 464.</p>	<p>CHEM 454 - Bioconjugate Chemistry</p> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Discussion of organic reactions to modify or label biopolymers including proteins, carbohydrates, and nucleic acids. Topics will include mechanistic and methodological details of commonly employed reactions used for chemoselective labeling or modification of biomolecules to produce synthetic vaccines, antibody-drug conjugates, and native chemical ligation will be discussed. Prerequisites: CHEM 351 or BIOCH 200; CHEM 361. Note: This course may not be taken for credit if credit has already been received in CHEM 464.</p>
---	--

Rationale for change: (Not required for course deletion or editorial changes)

Course Edits: as specified by instructors and offering divisions. In particular, CHEM 282 has been revised over the past few years to include linear algebra so this prerequisite has been added.

<p>Department Contact Name: Christie McDermott</p>	<p>Department Chair or Designate Name: Alex Brown</p>	<p>Date approved by Dept Council: May 25, 2022</p>
<p>Email: cmcdermo@ualberta.ca</p>	<p>Alex.brown@ualberta.ca</p>	<p>Date submitted to FoS: May 30, 2022</p> <p>Faculty Approval: October 7, 2022</p>

Upload this form to the FoS Calendar Google Site.

Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

- | | | | |
|--|---|--|---------------------------------|
| <p>1. Course Change
(new course, change to existing course, course deletion)</p> | <p>2. Editorial Change
(basic editing)</p> | <p>3. Admission Requirement</p> | <p>4. Program Change</p> |
|--|---|--|---------------------------------|

CURRENT	PROPOSED
<p>https://calendar.ualberta.ca/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=36&expand=&navoid=11383&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter</p>	
<p>CHEM 164 – Organic Chemistry I</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered first term</p> <p>Description The study of basic molecular structure and reactivity of organic compounds based on their functional groups. Introduction to nomenclature, three dimensional structure, physical properties, and reactivity of compounds of carbon. Functional groups covered will emphasize alkanes, alkenes, alkynes, alkyl halides, alcohols, and some aromatics. Examples will include hydrocarbons (petroleum products), halogenated organic compounds (e.g., pesticides), and polymers of industrial importance which may be found in everyday life. Note: Students who already have credit in CHEM 101 must register in CHEM 261. Prerequisite: Chemistry 30 or equivalent. Restricted to students with CHEM 30 averages of 90% or higher, or departmental approval.</p>	<p>DELETE COURSE</p>
<p>CHEM 406 – Special Topics in Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description Prerequisites: vary depending on topic. Check course notes on Bear Tracks for specific prerequisites.</p>	<p>DELETE COURSE</p>
<p>CHEM 419 – Bioanalytical and Environmental Analytical Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6</p>	<p>DELETE COURSE</p>

<p>Faculty Science Department Chemistry Typically Offered either term</p> <p>Description This is a two-part course with the first half consisting of an introduction to bioanalytical chemistry and the second half consisting of environmental analytical chemistry. The bioanalytical component will focus on methods used to analyze biomolecules and the analytical methods that exploit the molecular recognition properties of biomolecules. Topics may include antibodies, immunoassays, surface plasmon resonance, biosensors, gel electrophoresis, DNA sequencing, microscopy and imaging. The environmental component will cover methods and strategies used to measure trace levels of contaminants in complex environmental matrices, including air, water, soil, and biota. Topics may include sample handling and quality control, sample preparation and matrix effects, modern analytical instrumentation, measurement of reactive species, and online analysis techniques. Prerequisites: BIOCH 200 and CHEM 313 or BIOCH 200, CHEM 213 and a 300-level Chemistry course.</p>	
---	--

Rationale for change: (Not required for course deletion or editorial changes)
Course Deletions: CHEM 164 has not been offered (since 2017). CHEM 419 has changed topics/curriculum so that it no longer matches the Calendar description. Hence CHEM 419 has been split into two different offerings, which are currently running as Special Topics courses. CHEM 406 is a second, unnecessary Special Topics course (we only need one).

<p>Department Contact Name: Christie McDermott</p>	<p>Department Chair or Designate Name: Alex Brown</p>	<p>Date approved by Dept Council: May 25, 2022</p>
<p>Email: cmcdermo@ualberta.ca</p>	<p>Alex.brown@ualberta.ca</p>	<p>Date submitted to FoS: May 30, 2022</p> <p>Faculty Approval: October 7, 2022</p>

Upload this form to the FoS Calendar Google Site.
Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

- | | | | |
|---|---|------------------------------------|--------------------------|
| 1. Course Change
(new course,
change to existing
course, course
deletion) | 2. Editorial Change
(basic editing) | 3. Admission
Requirement | 4. Program Change |
|---|---|------------------------------------|--------------------------|

CURRENT	PROPOSED
https://calendar.ualberta.ca/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bpage%5D=1&cur_cat_oid=36&expand=&navoid=11383&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter	

<p>CHEM 243 - Advanced Inorganic Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered second term</p> <p>Description An extension of CHEM 241 with emphasis on the bonding, structure, and reactivity of transition-metal elements. The course will include applications in industrial, biochemical, environmental, and materials science. For Chemistry Honors and Specialization students only, except by consent of Department. Prerequisites: CHEM 241 or consent of Department.</p>	<p>CHEM 343 - Advanced Inorganic Chemistry</p> <hr/> <p>Course Career Undergraduate Units 3 Approved Hours 3-0-3 Fee index 6 Faculty Science Department Chemistry Typically Offered either term</p> <p>Description An extension of CHEM 241 with emphasis on the bonding, structure, and reactivity of transition-metal elements. The course will include applications in industrial, biochemical, environmental, and materials science. For Chemistry Honors and Specialization students only, except by consent of Department. Prerequisites: CHEM 241 or consent of Department. Students who have obtained credit for CHEM 243 cannot take CHEM 343 for credit.</p>
---	--

Rationale for change: (Not required for course deletion or editorial changes)

Course re-numbering: CHEM 243 becomes CHEM 343. This course content is currently delivered at the level of a 3rd year course so should be appropriately renumbered as such.

Department Contact Name: Christie McDermott	Department Chair or Designate Name: Alex Brown	Date approved by Dept Council: May 25, 2022
Email: cmcdermo@ualberta.ca	Alex.brown@ualberta.ca	Date submitted to FoS: May 30, 2022 Faculty Approval: October 7, 2022

Upload this form to the FoS Calendar Google Site.

Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

1. **Course Change** (new course, change to existing course, course deletion) 2. Editorial Change (basic editing) 3. Admission Requirement 4. Program Change

CURRENT	PROPOSED
https://calendar.ualberta.ca/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=36&expand=&navoid=11383&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter	
NEW COURSE	<p>CHEM 306 Green Chemistry Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term Introduction to green chemistry. The twelve principles and the metrics of green chemistry; Chemical wastes: their impact on health and the environment, and prevention; Green solvents and alternate methods that use safer chemicals; Catalysis and green catalysts; Renewable resources. Prerequisite: CHEM 263.</p>
NEW COURSE	<p>CHEM 351 - Introduction to Chemical Biology Course Career Undergraduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Science Department Chemistry Typically Offered either term Introduction to chemical strategies used to analyze and manipulate biochemical systems. Topics may include chemical synthesis of biopolymers, protein-small molecule interactions, chemoenzymatic synthesis, enzyme-inhibitor kinetics, assay design, characterization of bioorganic samples, and various chemical biology methods. Prerequisites: CHEM 263 and BLOCH 200.</p>
NEW COURSE	<p>CHEM 499: Advanced Chemical Research and Training Course Career Undergraduate Units 6 Approved Hours 0-1s-10 Fee index 12 Faculty Science Department Chemistry Typically Offered two term An advanced, two-term, research placement course where students complete chemical-based exploratory research under the direction of a faculty member of the Department. Research, professional development and seminar components are involved, preparing undergraduates to further build strong chemical foundations to succeed in graduate, industry, or professional school programs. Prerequisites: 4th-year standing in a Chemistry Honors or Chemistry Major program, two 300-level Chemistry courses, minimum GPA of 3.00, consent of instructor.</p>

Rationale for change: (Not required for course deletion or editorial changes)

CHEM 306 and 351 are new courses that will allow students to explore additional areas in Chemistry at the 3rd-year level. These courses will also allow students to have more choice in 300-level Chemistry courses and be accessible to students who do not have room in their schedules for laboratory-based coursework. Neither course has been offered before in this department. CHEM 499 is a new, one-year, research-based course for students who wish to have a comprehensive research experience.

:

Department Contact Name: Christie McDermott	Department Chair or Designate Name: Alex Brown	Date approved by Dept Council: May 25, 2022
Email: cmcdermo@ualberta.ca	Alex.brown@ualberta.ca	Date submitted to FoS: May 30, 2022 Faculty Approval: October 7, 2022

Upload this form to the FoS Calendar Google Site.

Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

Department of Mathematical and Statistical Sciences

May 10 , 2022

Course Changes

Current	Proposed
<p>MATH 214 - Intermediate Calculus I</p> <hr/> <p>★ 3 (<i>fi</i> 6) (either term, 3-0-0) Infinite Series. Plane curves and polar coordinates. Three dimensional analytic geometry. Partial derivatives. Prerequisite: One of MATH 101, 115, 136, 146 or 156, and one of MATH 102, 125 or 127. Note: This course may not be taken for credit if credit has already been obtained in MATH 209 or 217.</p>	<p>MATH 214 - Intermediate Calculus I</p> <hr/> <p>★ 3 (<i>fi</i> 6) (either term, 3-0-0) Infinite Series. Plane curves and polar coordinates. Three dimensional analytic geometry. Partial derivatives. Prerequisite: One of MATH 101, 115, 118, 136, 146 or 156, and one of MATH 102, 125 or 127. Note: This course may not be taken for credit if credit has already been obtained in MATH 209 or 217.</p>

Current	Proposed
<p>New Course Early implementation</p>	<p><u>MATH 226 – Algebraic Structures</u></p> <hr/> <p>★ 3 (fi 6) (either term, 3-0-0) Groups and their homomorphisms; commutative rings and modules; fields and vector spaces; subgroups and quotient groups, permutation groups; modules, submodules, quotient modules; polynomials rings and their ideals, modules over polynomial rings. Prerequisite: MATH 125. Note : Cannot be taken for credit if credit has been received in MATH 227</p>

Rationale : A general introduction to abstract algebra, designed to replace MATH 228 in mathematical sciences programs.

Current	Proposed
<p>New Course</p>	<p><u>MATH 327 Algebra I</u></p> <hr/> <p>★ 3 (fi 6) (first term, 3-0-0) Basic group theory: Groups, subgroups, normal subgroups, homomorphisms, quotient groups, coset decomposition, Example: Permutation group and general linear group; basic (commutative) ring theory: Rings, subrings, homomorphisms, ideals, quotient rings, modules over rings, submodules and quotient modules, fraction field; further group</p>

	theory: Groups operating on a set, Sylow theorems. Prerequisite : One of MATH 226 or MATH 227. Note: Credit can be obtained in at most one of MATH 326 and MATH 327.
--	--

Current	Proposed
New Course	<p>MATH 329 – Algebra II</p> <p>★ 3 (fi 6) (second term, 3-0-0) Factorial rings and principal ideal domains; Noetherian rings and modules, Hilbert basis theorem; field extensions, separable and normal extensions; finite Galois theory; solvable groups and equations, construction by ruler and compass, solution by radicals. Prerequisite : MATH 327. Note : Credit can be obtained in a most one of MATH 328 and 329.</p>

Rationale : MATH 327 and 329 will replace the current MATH 326 and 328 algebra sequence. A more coherent algebra curriculum without the artificial distinction between group and ring theory. Replacing the structure theory of torsion modules over a PID, which is moved to MATH 227, with more field theory including basic Galois theory. Otherwise the unions of the contents of the new resp. old MATH 326/328 are the same.

Current	Proposed
<p>New Course</p>	<p>MATH 256 - Elementary Number Theory ★ 3 (fi 6) (first term, 3-0-0) Divisibility, prime numbers, congruences, quadratic residues, quadratic reciprocity, arithmetic functions and diophantine equations; sums of squares. Prerequisites: MATH 125 or 127.</p>

Rationale : MATH 324 is being renumbered as a 200-level course which will serve as a replacement for MATH 228 in programs such as BEd Secondary Mathematics major and the BSc/Bed combined Mathematics degree.

<p>STAT 413 -- Introduction to Computing for Data Science</p> <hr/> <p>★ 3 (fi 6) (second term, 3-0-0) Survey of contemporary languages/environments suitable for algorithms of Statistics and Data Science. Introduction to Monte Carlo methods, random number generation and numerical integration in statistical context and optimization for both smooth and constrained alternatives, tailored to specific applications in statistics and machine learning. Prerequisites: STAT 265 or consent of the instructor.</p>	<p>STAT 413 - Computing for Data Science</p> <hr/> <p>★ 3 (fi 6) (second term, 3-0-0) Survey of contemporary languages/environments suitable for algorithms of Statistics and Data Science. Introduction to Monte Carlo methods, random number generation and numerical integration in statistical context and optimization for both smooth and constrained alternatives, tailored to specific applications in statistics and machine learning. Prerequisites: STAT 265 or consent of the instructor.</p>
--	---

Faculty (& Department or Academic Unit):	Faculty of Science, Department of Mathematical and Statistical Sciences
Contact Person:	Dr. Nicolas Guay, Associate Chair for Undergraduate Studies
Level of change: (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate
	<input type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2023

Rationale

Things to consider (maximum 500 words): Why is this being changed; How will it benefit students/department/unit; How is this comparable to similar programs (internal or external); Historical context; Impacts to administration or program structure; Consultation with stakeholders

When students are required to work on research projects, either for upper-level courses or during the summer, they usually struggle regarding how to properly plan the projects, how to obtain and analyze the data, and how to present or write up their research findings. While taking courses focusing mainly on content knowledge, there is usually not enough time for them to be instructed on these research skills. Thus, with insufficient guidance on their projects, students can feel lost and stressed.

The purpose of SCI 201 is to fill this gap in knowledge. Thus, it guides students through the step-by-step process of coming up with a research idea/research problem, doing a literature review on the topic, formulating an appropriate research design to solve the research problem, writing a proposal describing the research plan, collecting data, analyzing data, and writing a final report. The scientific communication part of this course is very important. As part of the course, each student individually conducts a mini-research project, and each is evaluated on writing a research proposal, giving an oral presentation, making a poster, and writing a final scientific report. The graduate students working at the Training and Consulting Centre (TCC) could perhaps give advice to undergraduates about their mini-research projects.

Since statistical analysis and its application in research is an important part of this course, the prerequisites for SCI 201 are either STAT 151 or 161 and any 100-level science course. SCI 201 thus forms an important bridge between the science and statistics learned in first year and courses that students undertake in their third and fourth years where they are required to conduct research projects.

SCI 201 is a very practical, hands-on learning experience that helps students fully understand scientific research. It will be a very useful course for students in all departments of the Faculty of Science. It will enable them to learn about the entire scientific process in a coherent, integrated, and systematic manner – from a research idea to the final report, to develop their research skills, and to be successful in their future research projects. Every week, this course would involve three hours of lectures and one devoted to a seminar. The seminars would be used for class discussions (generally in groups) and oral presentations.

This course is being proposed by Gregory Wagner, who was an instructor at MacEwan University before joining our teaching staff: he implemented a course similar to SCI 201 at MacEwan and it was very well received by the students with its enrollment tripling in about five years.

--

Course Template

Current:	Proposed: <i>Revised</i>
<p>NEW COURSE</p>	<p>Subject & Number SCI 201 Title The Scientific Process Course Career Undergraduate Units 3 Approved Hours 3-1-0 Fee index 6 Faculty Science Department Mathematical and Statistical Sciences Typically Offered Either term</p> <p>Description This course addresses qualities of competent scientists, research ethics, the multidisciplinary approach to studies in the natural and social sciences, and types of scientific studies. As part of the course, students conduct mini-research projects to practice working through all four phases of the scientific process: planning and preparation, data collection, data analysis and interpretation, and scientific writing and presentation. Prerequisites: A minimum of C- in STAT 151 or STAT 161 and any 100-level science course.</p>

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date.
--

OPTIONAL: Other internal faculty approving bodies, consultation groups, or departments, and approval dates.

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

- | | | | |
|--|---|------------------------------------|--------------------------|
| 1. Course Change
(new course,
change to existing
course, course
deletion) | 2. Editorial Change
(basic editing) | 3. Admission
Requirement | 4. Program Change |
|--|---|------------------------------------|--------------------------|

CURRENT	PROPOSED
<p style="text-align: center;">https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42307</p> <p>Honors in Chemistry [Science]</p> <hr/> <p>Honors students in Chemistry must take a core of Chemistry and auxiliary courses. The core consists of 45 units in Chemistry courses, 12 units in Mathematics courses, 6 units in Physics courses, 3 units in BIOCH 200, 3 units in CHEM 401, 6 units in a junior ENGL or 3 units in ENGL and 3 units in Arts option, and 12 units in Arts options. In addition to the core courses, honors students must complete at least 18 units in senior courses in Chemistry from the courses listed below, with 6 units of these taken at the 400-level. Finally, the honors student must include 15 units in options in the third and fourth years of the program. These are normally chosen from offerings within the Faculty of Science (see details of courses). All options must be selected in consultation with the Department of Chemistry.</p> <p>Continuation in the Honors in Chemistry program requires successful completion of at least 24 units with a minimum 3.0 GPA and a minimum 3.0 GPA on all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <p>The Honors Chemistry degree is accredited by the Canadian Society for Chemistry.</p>	<p style="text-align: center;">PROPOSED</p> <p>Honors in Chemistry [Science]</p> <hr/> <p>Honors students in Chemistry must take a core of Chemistry and auxiliary courses. The core consists of 45 units in Chemistry courses, 9 units in Mathematics courses, 6 units in Physics courses, 3 units in BIOCH 200, 3 units in CHEM 401, 6 units in a junior ENGL or 3 units in ENGL and 3 units in Arts option, and 12 units in Arts options. In addition to the core courses, honors students must complete at least 18 units in senior courses in Chemistry from the courses listed below, with 6 units of these taken at the 400-level. Finally, the honors student must include 18 units in options. These are normally chosen from offerings within the Faculty of Science (see details of courses). All options must be selected in consultation with the Department of Chemistry.</p> <p>Continuation in the Honors in Chemistry program requires successful completion of at least 24 units with a minimum 3.0 GPA and a minimum 3.0 GPA on all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <p>The Honors Chemistry degree is accredited by the Canadian Society for Chemistry.</p>
<p>Year 1</p> <p>CHEM 101 - Introductory University Chemistry I CHEM 102 - Introductory University Chemistry II</p> <p>CHEM 261 - Organic Chemistry I OR CHEM 264 - Organic Chemistry I: Theory AND CHEM 266 - Introductory Laboratory Skills in Organic Chemistry</p> <p>MATH 134 - Calculus for the Life Sciences I OR MATH 144 - Calculus for the Physical Sciences I</p> <p>MATH 136 - Calculus for the Life Sciences II OR MATH 146 - Calculus for the Physical Sciences II</p> <p>PHYS 144 - Newtonian Mechanics and Relativity AND PHYS 146 - Fluids and Waves (recommended) OR PHYS 124 - Particles and Waves AND PHYS 126 - Fluids, Fields, and Radiation 6 units in junior ENGL OR 3 units in junior ENGL and 3 units in an Arts option 3 units in Science option (see details of courses)</p>	<p style="text-align: center;">NO CHANGE</p>

<p>Year 2</p> <hr/> <p>CHEM 211 - Quantitative Analysis I CHEM 213 - Quantitative Analysis II CHEM 241 - Introduction to Inorganic Chemistry CHEM 243 - Advanced Inorganic Chemistry</p> <p>CHEM 263 - Organic Chemistry II OR CHEM 265 - Organic Chemistry II: Theory AND CHEM 267 - Practical Applications in Organic Chemistry</p> <p>CHEM 282 - Atomic and Molecular Structure MATH 214 - Intermediate Calculus III</p> <p>MATH 125 - Linear Algebra I OR MATH 215 - Intermediate Calculus IV OR STAT 151 - Introduction to Applied Statistics I</p> <p>6 units in Arts options</p>	<p>Year 2</p> <hr/> <p>CHEM 211 - Quantitative Analysis I CHEM 213 - Quantitative Analysis II CHEM 241 - Introduction to Inorganic Chemistry CHEM 343 - Advanced Inorganic Chemistry</p> <p>CHEM 263 - Organic Chemistry II OR CHEM 265 - Organic Chemistry II: Theory AND CHEM 267 - Practical Applications in Organic Chemistry</p> <p>CHEM 282 - Atomic and Molecular Structure</p> <p>MATH 125 - Linear Algebra I OR STAT 151 - Introduction to Applied Statistics I</p> <p>6 units in Arts options 3 units in Science option (see details of courses)</p>
<p>Years 3 and 4</p> <hr/> <p>CHEM 313 - Instrumentation in Chemical Analysis CHEM 361 - Organic Chemistry CHEM 371 - Energetics of Chemical Reactions CHEM 373 - Physical Properties and Dynamics of Chemical Systems CHEM 398 - Molecular Spectroscopy CHEM 401 - Introduction to Chemical Research CHEM 460 - Contemporary Organic Chemistry BIOCH 200 - Introductory Biochemistry</p> <p>18 units in senior chemistry courses (with at least 6 units taken at the 400-level). 12 units in Science options (see details of courses) 6 units in Arts options</p>	<p>NO CHANGE</p>
<p>Senior Courses in Chemistry</p> <hr/> <p>BIOCH 310 - Bioenergetics and Metabolism BIOCH 320 - Structure and Catalysis BIOCH 330 - Nucleic Acids and Molecular Biology CHEM 303 - Environmental Chemistry I CHEM 305 - Environmental Chemistry II CHEM 333 - Inorganic Materials Chemistry CHEM 403 - Chemical Research CHEM 405 - Special Topics in Chemistry CHEM 419 - Bioanalytical and Environmental Analytical Chemistry CHEM 424 - Optical Spectroscopy and Electrochemistry CHEM 425 - Separations and Mass Spectrometry CHEM 434 - X-ray Crystallography CHEM 436 - Synthesis and Applications of Inorganic and Nano-materials CHEM 437 - Transition Metal Chemistry CHEM 438 - Solid State Chemistry CHEM 443 - Asymmetric Catalysis CHEM 444 - Characterization Methods in Nanoscience CHEM 451 - Chemical Biology CHEM 454 - Bioconjugate Chemistry CHEM 461 - Qualitative Organic Analysis CHEM 462 - Physical Organic Chemistry CHEM 463 - Organic Synthesis CHEM 477 - Molecular Symmetry and Spectroscopy CHEM 479 - Molecular Kinetics CHEM 489 CHEM 493 - Computational Chemistry CHEM 495 - Molecular Dynamics and its Applications</p>	<p>Senior Courses in Chemistry</p> <hr/> <p>BIOCH 310 - Bioenergetics and Metabolism BIOCH 320 - Structure and Catalysis BIOCH 330 - Nucleic Acids and Molecular Biology CHEM 303 - Environmental Chemistry I CHEM 305 - Environmental Chemistry II CHEM 306 - Green Chemistry CHEM 333 - Inorganic Materials Chemistry CHEM 351 - Introduction to Chemical Biology CHEM 403 - Chemical Research CHEM 405 - Special Topics in Chemistry CHEM 424 - Optical Spectroscopy and Electrochemistry CHEM 425 - Separations and Mass Spectrometry CHEM 434 - X-ray Crystallography CHEM 436 - Synthesis and Applications of Inorganic and Nano-materials CHEM 437 - Transition Metal Chemistry CHEM 438 - Solid State Chemistry CHEM 443 - Asymmetric Catalysis CHEM 444 - Characterization Methods in Nanoscience CHEM 451 - Chemical Biology CHEM 454 - Bioconjugate Chemistry CHEM 461 - Qualitative Organic Analysis CHEM 462 - Physical Organic Chemistry CHEM 463 - Organic Synthesis CHEM 477 - Molecular Symmetry and Spectroscopy CHEM 479 - Molecular Kinetics CHEM 493 - Computational Chemistry CHEM 495 - Molecular Dynamics and its Applications CHEM 499 - Advanced Chemical Research and Training</p>
<p>Notes</p> <hr/> <p>Credit in SCI 100 will be considered equivalent to CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115, PHYS 144, PHYS 146, BIOL 107 and 3 units Science option (see details of courses). Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units Science option.</p>	<p>NO CHANGE</p>

--	--

Rationale for change: (Not required for course deletion or editorial changes)

Elimination of [MATH 214](#) as a requirement in the Honors Program: this course is not necessary for accreditation in this program. Prerequisites for this course changed to recommend MATH 125 (Linear Algebra), which is not a program requirement in the Chemistry Honors program, therefore many of our students do not have the appropriate prerequisite to take and do well in MATH 214. There will not be any MATH 214 requirements in the upcoming new BSc programs, so elimination of it now was reasonable.

The other changes are due to course offering changes (new courses and deleted courses).

:

Department Contact Name: Christie McDermott	Department Chair or Designate Name: Alex Brown	Date approved by Dept Council: May 25, 2022
Email: cmcdermo@ualberta.ca	Alex.brown@ualberta.ca	Date submitted to FoS: May 30, 2022 Faculty Approval: October 7, 2022

Upload this form to the FoS Calendar Google Site.
 Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

CALENDAR CHANGE REQUEST FORM

Department: CHEMISTRY

Highlight type of change request below:

1. **Course Change** (new course, change to existing course, course deletion) 2. **Editorial Change** (basic editing) 3. **Admission Requirement** 4. **Program Change**

CURRENT	PROPOSED
https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42306	
<p>Specialization in Chemistry [Science]</p> <hr/> <p>Continuation in the Specialization in Chemistry program requires successful completion of at least 18 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.</p> <p>The Specialization Chemistry degree is accredited by the Canadian Society for Chemistry.</p>	<p>NO CHANGE</p>
<p>Year 1</p> <hr/> <p><u>CHEM 101 - Introductory University Chemistry I</u> <u>CHEM 102 - Introductory University Chemistry II</u></p> <p><u>CHEM 261 - Organic Chemistry I</u> OR <u>CHEM 164 - Organic Chemistry I</u> OR <u>CHEM 264 - Organic Chemistry I: Theory AND CHEM 266 - Introductory Laboratory Skills in Organic Chemistry</u></p> <p><u>MATH 134 - Calculus for the Life Sciences I</u> OR <u>MATH 144 - Calculus for the Physical Sciences I</u></p> <p><u>MATH 136 - Calculus for the Life Sciences II</u> OR <u>MATH 146 - Calculus for the Physical Sciences II</u></p> <p><u>PHYS 144 - Newtonian Mechanics and Relativity</u> AND <u>PHYS 146 - Fluids and Waves</u> (recommended) OR <u>PHYS 124 - Particles and Waves</u> AND <u>PHYS 126 - Fluids, Fields, and Radiation</u></p> <p>3 units in junior ENGL and 3 units in Arts option 3 units in Science option (see details of courses)</p>	<p>Year 1</p> <hr/> <p><u>CHEM 101 - Introductory University Chemistry I</u> <u>CHEM 102 - Introductory University Chemistry II</u></p> <p><u>CHEM 261 - Organic Chemistry I</u> OR <u>CHEM 264 - Organic Chemistry I: Theory AND CHEM 266 - Introductory Laboratory Skills in Organic Chemistry</u></p> <p><u>MATH 134 - Calculus for the Life Sciences I</u> OR <u>MATH 144 - Calculus for the Physical Sciences I</u></p> <p><u>MATH 136 - Calculus for the Life Sciences II</u> OR <u>MATH 146 - Calculus for the Physical Sciences II</u></p> <p><u>PHYS 144 - Newtonian Mechanics and Relativity</u> AND <u>PHYS 146 - Fluids and Waves</u> (recommended) OR <u>PHYS 124 - Particles and Waves</u> AND <u>PHYS 126 - Fluids, Fields, and Radiation</u></p> <p>3 units in junior ENGL and 3 units in Arts option 3 units in Science option (see details of courses)</p>
<p>Year 2</p> <hr/> <p><u>CHEM 211 - Quantitative Analysis I</u> <u>CHEM 213 - Quantitative Analysis II</u> <u>CHEM 241 - Introduction to Inorganic Chemistry</u> <u>CHEM 243 - Advanced Inorganic Chemistry</u></p> <p><u>CHEM 263 - Organic Chemistry II</u> OR <u>CHEM 265 - Organic Chemistry II: Theory AND CHEM 267 - Practical Applications in Organic Chemistry</u></p>	<p>Year 2</p> <hr/> <p><u>CHEM 211 - Quantitative Analysis I</u> <u>CHEM 213 - Quantitative Analysis II</u> <u>CHEM 241 - Introduction to Inorganic Chemistry</u> <u>CHEM 343 - Advanced Inorganic Chemistry</u></p> <p><u>CHEM 263 - Organic Chemistry II</u> OR <u>CHEM 265 - Organic Chemistry II: Theory AND CHEM 267 - Practical Applications in Organic Chemistry</u></p>

<p>CHEM 282 - Atomic and Molecular Structure</p> <p>MATH 214 - Intermediate Calculus III</p> <p>MATH 125 - Linear Algebra I OR</p> <p>MATH 215 - Intermediate Calculus IV OR</p> <p>STAT 151 - Introduction to Applied Statistics I</p> <p>6 units in Arts options</p>	<p>CHEM 282 - Atomic and Molecular Structure</p> <p>MATH 125 - Linear Algebra I OR</p> <p>STAT 151 - Introduction to Applied Statistics I</p> <p>6 units in Arts options</p> <p>3 units in Science option (see details of courses)</p>
<p>Years 3 and 4</p> <hr/> <p>CHEM 313 - Instrumentation in Chemical Analysis</p> <p>CHEM 361 - Organic Chemistry</p> <p>CHEM 371 - Energetics of Chemical Reactions</p> <p>CHEM 373 - Physical Properties and Dynamics of Chemical Systems</p> <p>CHEM 398 - Molecular Spectroscopy</p> <p>BIOCH 200 - Introductory Biochemistry</p> <p>9 units in senior chemistry courses (with at least 3 units taken at the 400-level).</p> <p>12 units in Science options (see details of courses)</p> <p>6 units in Arts options</p> <p>15 units in approved options</p>	<p>NO CHANGE</p>
<p>Senior Courses in Chemistry</p> <hr/> <p>BIOCH 310 - Bioenergetics and Metabolism</p> <p>BIOCH 320 - Structure and Catalysis</p> <p>BIOCH 330 - Nucleic Acids and Molecular Biology</p> <p>CHEM 303 - Environmental Chemistry I</p> <p>CHEM 305 - Environmental Chemistry II</p> <p>CHEM 333 - Inorganic Materials Chemistry</p> <p>CHEM 401 - Introduction to Chemical Research</p> <p>CHEM 403 - Chemical Research</p> <p>CHEM 405 - Special Topics in Chemistry</p> <p>CHEM 419 - Bioanalytical and Environmental Analytical Chemistry</p> <p>CHEM 424 - Optical Spectroscopy and Electrochemistry</p> <p>CHEM 425 - Separations and Mass Spectrometry</p> <p>CHEM 434 - X-ray Crystallography</p> <p>CHEM 436 - Synthesis and Applications of Inorganic and Nano-materials</p> <p>CHEM 437 - Transition Metal Chemistry</p> <p>CHEM 438 - Solid State Chemistry</p> <p>CHEM 443 - Asymmetric Catalysis</p> <p>CHEM 444 - Characterization Methods in Nanoscience</p> <p>CHEM 451 - Chemical Biology</p> <p>CHEM 454 - Bioconjugate Chemistry</p> <p>CHEM 460 - Contemporary Organic Chemistry</p> <p>CHEM 461 - Qualitative Organic Analysis</p> <p>CHEM 462 - Physical Organic Chemistry</p> <p>CHEM 463 - Organic Synthesis</p> <p>CHEM 477 - Molecular Symmetry and Spectroscopy</p> <p>CHEM 479 - Molecular Kinetics</p> <p>CHEM 489</p> <p>CHEM 493 - Computational Chemistry</p> <p>CHEM 495 - Molecular Dynamics and its Applications</p>	<p>Senior Courses in Chemistry</p> <hr/> <p>BIOCH 310 - Bioenergetics and Metabolism</p> <p>BIOCH 320 - Structure and Catalysis</p> <p>BIOCH 330 - Nucleic Acids and Molecular Biology</p> <p>CHEM 303 - Environmental Chemistry I</p> <p>CHEM 305 - Environmental Chemistry II</p> <p>CHEM 306 – Green Chemistry</p> <p>CHEM 333 - Inorganic Materials Chemistry</p> <p>CHEM 351 – Introduction to Chemical Biology</p> <p>CHEM 401 - Introduction to Chemical Research</p> <p>CHEM 403 - Chemical Research</p> <p>CHEM 405 - Special Topics in Chemistry</p> <p>CHEM 424 - Optical Spectroscopy and Electrochemistry</p> <p>CHEM 425 - Separations and Mass Spectrometry</p> <p>CHEM 434 - X-ray Crystallography</p> <p>CHEM 436 - Synthesis and Applications of Inorganic and Nano-materials</p> <p>CHEM 437 - Transition Metal Chemistry</p> <p>CHEM 438 - Solid State Chemistry</p> <p>CHEM 443 - Asymmetric Catalysis</p> <p>CHEM 444 - Characterization Methods in Nanoscience</p> <p>CHEM 451 - Chemical Biology</p> <p>CHEM 454 - Bioconjugate Chemistry</p> <p>CHEM 460 - Contemporary Organic Chemistry</p> <p>CHEM 461 - Qualitative Organic Analysis</p> <p>CHEM 462 - Physical Organic Chemistry</p> <p>CHEM 463 - Organic Synthesis</p> <p>CHEM 477 - Molecular Symmetry and Spectroscopy</p> <p>CHEM 479 - Molecular Kinetics</p> <p>CHEM 493 - Computational Chemistry</p> <p>CHEM 495 - Molecular Dynamics and its Applications</p> <p>CHEM 499 – Advanced Chemical Research and Training</p>
<p>Notes</p> <hr/> <p>Approved options are normally chosen from offerings within the Faculty of Science.</p> <p>All options must be selected in consultation with the Department of Chemistry.</p> <p>Credit in SCI 100 will be considered equivalent to BIOL 107, CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115, PHYS 144, PHYS 146 and 3 units in Science options (see details of courses). Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units in Science options.</p>	<p>NO CHANGE</p>

Rationale for change: (Not required for course deletion or editorial changes)

Elimination of [MATH 214](#) as a requirement in the Chemistry Specialization Program: this course is not necessary for accreditation in this program. Prerequisites for this course changed to recommend MATH 125 (Linear Algebra), which is not a program requirement in the Chemistry Specialization program, therefore many of our students do not have the appropriate prerequisite to take and do well in MATH 214. There will not be any MATH 214 requirements in the upcoming new BSc programs, so elimination of it now was reasonable.

The other changes are due to course offering changes (course deletions and new courses).

:

Department Contact Name: Christie McDermott	Department Chair or Designate Name: Alex Brown	Date approved by Dept Council: May 25, 2022
Email: cmcdermo@ualberta.ca	Alex.brown@ualberta.ca	Date submitted to FoS: May 30, 2022 Faculty Approval: October 7, 2022

Upload this form to the FoS Calendar Google Site.

Include one form for each grouping of changes. ie, all course changes can go in one document if they were approved at the same department council.

**DEPARTMENT OF BIOLOGICAL SCIENCES
PROGRAM CHANGE TEMPLATE**

SECTION A: PROGRAM INFORMATION	
Program Name	Honors and Specialization in Ecology, Evolution and Environmental Biology
Contact Person	Maya Evenden
Type of Initiative	<i>Change of courses listed in List E of program (Scientific Methodology)</i>
Enrolment Change:	<i>No effect on enrollment</i>
Implementation Date	2023-2024 Course calendar
Program Synopsis	<i>Change of courses to be listed in List E (Scientific Methodology).</i>
SECTION B: RATIONALE FOR AND IMPLICATIONS OF THE PROPOSED CHANGE	
Rationale for Program Change	<i>To coincide with removal of BIOL 365, BIOL 432, and BOT 322, List E (Scientific Methodology) needs to change. These courses should be removed from List E and BIOL 395 should be added to List E.</i>
	Provider Comments: One of the recommendations received by the QA review process was to amalgamate field course offerings under an umbrella field course. BIOL 395 will have the flexibility to serve as an umbrella course for field offerings that instructors want to offer. As a result, we are removing the more specific field courses and leaving BIOL 395 open to flexible field offerings.
	Department Comments:
Resource Implications	<i>(Identify the resource implications of the proposed change. Identify if resources are being re-allocated to or from other areas, and outline the implications of this re-allocation.)</i>
	Provider Comments: There would be no implications for resources for the requested change. Field courses require extra student fees, and that structure of each BIOL 395 course offering would include an appropriate fee schedule.
	Department Comments
Implications of Program Change for the System	<i>(Identify the implications of the proposed change for the system. For example, will the change affect access, programs at other institutions, etc.?)</i>
	Provider Comments: Students can take BIOL 395 in place of the field offerings that are being removed.
	Department Comments:

<p>People Consulted (e.g., Ecology course instructors). 2) Approval Documentation (e.g., summary of email vote, comments from peers).</p>	
--	--

SECTION C: RECOMMENDATION (FOR DEPARTMENT USE)	
Do Any Issues or Information Gaps Remain?	<i>(The department will list any issues or information gaps that remain following consultation with the proposing institution.)</i>
Recommendation(s):	
Reviewer	
Date Completed	

**Program change template
2023-2024 Calendar**

- Indicate your deletions in the left column and your additions in the right column.
- To indicate deletions ~~strike through text~~.
- To indicate additions underline text.
- Indicate renumbering by crossing out (4) in left column and underline (2) in the right column.
- Do not use the track changes feature in Word to indicate changes in the comparative table

Ecology, Evolution and Environmental Biology (Honors)

CURRENT	PROPOSED
Year 1	Year 1
BIOL 107, 108 CHEM 101, 164 or 261 MATH 134 (or 114 or 117 or 144 or 125) STAT 151 *6 Arts options (junior level ENGL or junior WRS recommended) *6 Science options (EAS 100 recommended)	BIOL 107, 108 CHEM 101, 164 or 261 MATH 134 (or 114 or 117 or 144 or 125) STAT 151 *6 Arts options (junior level ENGL or junior WRS recommended) *6 Science options (EAS 100 recommended)
Year 2	Year 2
BIOL 207, 208, 221 *3 from List A (Biological Diversity) *3 from Lists A or B (Biological Diversity or Processes) *9 Science or approved options *6 Arts options	BIOL 207, 208, 221 *3 from List A (Biological Diversity) *3 from Lists A or B (Biological Diversity or Processes) *9 Science or approved options *6 Arts options
Years 3 and 4	Years 3 and 4
BIOL 499 *3 from List A (Biological Diversity; at 300-level or higher) *3 from List B (Biological Processes) *3 from List C (Ecology & Environmental Biology) *3 from List D (Evolution & Systematics) *15 from Lists C or D (at least *9 at 400 level) *6 from List E (Scientific Methodology) *6 Arts options *15 Science or approved options List A (Biological Diversity) BIOL 322, 361, 495 (if appropriate topic); BOT 205, 306, 314, 321, 322, 330, 411; ENT 220, 222, 327; MA SC 402 (if appropriate topic), 410, 412; MICRB 265; PALEO 201; ZOOL 224, 250, 351, 352, 405, 406, 407, 408 List B (Biological Processes) BIOL 310, 495 (if appropriate topic); BOT 303, 308, 340; GENET 270, 305, 364; IMIN 200, 324; MA SC 415; MICRB 311; ZOOL 241, 242, 303, 340, 452 List C (Ecology & Environmental Biology)	BIOL 499 *3 from List A (Biological Diversity; at 300-level or higher) *3 from List B (Biological Processes) *3 from List C (Ecology & Environmental Biology) *3 from List D (Evolution & Systematics) *15 from Lists C or D (at least *9 at 400 level) *6 from List E (Scientific Methodology) *6 Arts options *15 Science or approved options List A (Biological Diversity) BIOL 322, 361, 495 (if appropriate topic); BOT 205, 306, 314, 321, 322, 330, 411; ENT 220, 222, 327; MA SC 402 (if appropriate topic), 410, 412; MICRB 265; PALEO 201; ZOOL 224, 250, 351, 352, 405, 406, 407, 408 List B (Biological Processes) BIOL 310, 495 (if appropriate topic); BOT 303, 308, 340; GENET 270, 305, 364; IMIN 200, 324; MA SC 415; MICRB 311; ZOOL 241, 242, 303, 340, 452 List C (Ecology & Environmental Biology)

<p>BIOL 331, 332, 333, 340, 341, 361, 364, 366, 367, 381, 384, 433, 434, 440, 468, 471, 495 (if appropriate topic); BOT 330, 332; MA SC 401, 402 (if appropriate topic), 425, 430, 437; MICRB 320, 423, 491; ZOOL 371</p> <p>List D (Evolution & Systematics) BIOL 322, 335, 380, 421, 495 (if appropriate topic); ENT 327; MA SC 402 (if appropriate topic), PALEO 414, 418, 419; ZOOL 325, 350</p> <p>List E (Scientific Methodology) BIOIN 301, 401; BIOL 330, 335, 365, 392, 421, 430, 432; BOT 322, 332; ENT 327; IMIN 410; MA SC 402 (if appropriate topic); MICRB 315, 392; PALEO 400; ZOOL 350, 351</p> <p>Notes</p> <p>(1) May not use same course to fill more than one program requirement. (2) Up to *12 from approved options may be taken from other faculties. (3) BIOL 298, 398, 399, 498, 499 and INTD 400 may count towards Science or approved options. (4) Credit in SCI 100 will be considered equivalent to BIOL 107, 108; CHEM 101, 102, 261; MATH 114, *3 Science options and *6 approved options.</p>	<p>BIOL 331, 332, 333, 340, 341, 361, 364, 366, 367, 381, 384, 433, 434, 440, 468, 471, 495 (if appropriate topic); BOT 330, 332; MA SC 401, 402 (if appropriate topic), 425, 430, 437; MICRB 320, 423, 491; ZOOL 371</p> <p>List D (Evolution & Systematics) BIOL 322, 335, 380, 421, 495 (if appropriate topic); ENT 327; MA SC 402 (if appropriate topic), PALEO 414, 418, 419; ZOOL 325, 350</p> <p>List E (Scientific Methodology) BIOIN 301, 401; BIOL 330, 335, 392, 395, 421, 430; BOT 332; ENT 327; IMIN 410; MA SC 402 (if appropriate topic); MICRB 315, 392; PALEO 400; ZOOL 350, 351</p> <p>Notes</p> <p>(1) May not use same course to fill more than one program requirement. (2) Up to *12 from approved options may be taken from other faculties. (3) BIOL 298, 398, 399, 498, 499 and INTD 400 may count towards Science or approved options. (4) Credit in SCI 100 will be considered equivalent to BIOL 107, 108; CHEM 101, 102, 261; MATH 114, *3 Science options and *6 approved options.</p>
---	---

Ecology, Evolution and Environmental Biology (Specialization)

CURRENT	PROPOSED
Year 1	Year 1
BIOL 107, 108 CHEM 101, 164 or 261 MATH 134 (or 114 or 117 or 144 or 125) STAT 151 *6 Arts options (junior level ENGL or junior WRS recommended) *6 Science options (EAS 100 recommended)	BIOL 107, 108 CHEM 101, 164 or 261 MATH 134 (or 114 or 117 or 144 or 125) STAT 151 *6 Arts options (junior level ENGL or junior WRS recommended) *6 Science options (EAS 100 recommended)
Year 2	Year 2
BIOL 207, 208, 221 *3 from List A (Biological Diversity) *3 from Lists A or B (Biological Diversity or Processes) *9 Science or approved options *6 Arts options	BIOL 207, 208, 221 *3 from List A (Biological Diversity) *3 from Lists A or B (Biological Diversity or Processes) *9 Science or approved options *6 Arts options
Years 3 and 4	Years 3 and 4
*3 from List A (Biological Diversity; at 300-level or higher) *3 from List B (Biological Processes) *3 from List C (Ecology & Environmental Biology) *3 from List D (Evolution & Systematics)	*3 from List A (Biological Diversity; at 300-level or higher) *3 from List B (Biological Processes) *3 from List C (Ecology & Environmental Biology) *3 from List D (Evolution & Systematics)

*12 from Lists C or D (at least *6 at 400 level)
*3 from List E (Scientific Methodology)
*6 Arts options
*27 Science or approved options

List A (Biological Diversity)

BIOL 322, 361, 495 (if appropriate topic); BOT 205, 306, 314, 321, 322, 330, 411; ENT 220, 222, 327; MA SC 402 (if appropriate topic), 410, 412; MICRB 265; PALEO 201; ZOOL 224, 250, 351, 352, 405, 406, 407, 408

List B (Biological Processes)

BIOL 310, 495 (if appropriate topic); BOT 303, 308, 340; GENET 270, 305, 364; IMIN 200, 324; MA SC 415; MICRB 311; ZOOL 241, 242, 303, 340, 452

List C (Ecology & Environmental Biology)

BIOL 331, 332, 333, 340, 341, 361, 364, 366, 367, 381, 384, 433, 434, 440, 468, 471, 495 (if appropriate topic); BOT 330, 332; MA SC 401, 402 (if appropriate topic), 425, 430, 437; MICRB 320, 423, 491; ZOOL 371

List D (Evolution & Systematics)

BIOL 322, 335, 380, 421, 495 (if appropriate topic); ENT 327; MA SC 402 (if appropriate topic); PALEO 414, 418, 419; ZOOL 325, 350

List E (Scientific Methodology)

BIOIN 301, 401; BIOL 330, 335, 365, 392, 421, 430, 432; BOT 322, 332; ENT 327; IMIN 410; MA SC 402 (if appropriate topic); MICRB 315, 392; PALEO 400; ZOOL 350, 351

Notes

- (1) May not use same course to fill more than one program requirement.
- (2) Up to *12 from approved options may be taken from other faculties.
- (3) BIOL 298, 398, 399, 498, 499 and INTD 400 may count towards Science or approved options.
- (4) Credit in SCI 100 will be considered equivalent to BIOL 107, 108; CHEM 101, 102, 261; MATH 114, *3 Science options and *6 approved options.

*12 from Lists C or D (at least *6 at 400 level)
*3 from List E (Scientific Methodology)
*6 Arts options
*27 Science or approved options

List A (Biological Diversity)

BIOL 322, 361, 495 (if appropriate topic); BOT 205, 306, 314, 321, 322, 330, 411; ENT 220, 222, 327; MA SC 402 (if appropriate topic), 410, 412; MICRB 265; PALEO 201; ZOOL 224, 250, 351, 352, 405, 406, 407, 408

List B (Biological Processes)

BIOL 310, 495 (if appropriate topic); BOT 303, 308, 340; GENET 270, 305, 364; IMIN 200, 324; MA SC 415; MICRB 311; ZOOL 241, 242, 303, 340, 452

List C (Ecology & Environmental Biology)

BIOL 331, 332, 333, 340, 341, 361, 364, 366, 367, 381, 384, 433, 434, 440, 468, 471, 495 (if appropriate topic); BOT 330, 332; MA SC 401, 402 (if appropriate topic), 425, 430, 437; MICRB 320, 423, 491; ZOOL 371

List D (Evolution & Systematics)

BIOL 322, 335, 380, 421, 495 (if appropriate topic); ENT 327; MA SC 402 (if appropriate topic); PALEO 414, 418, 419; ZOOL 325, 350

List E (Scientific Methodology)

BIOIN 301, 401; BIOL 330, 335, 392, 395, 421, 430; BOT 332; ENT 327; IMIN 410; MA SC 402 (if appropriate topic); MICRB 315, 392; PALEO 400; ZOOL 350, 351

Notes

- (1) May not use same course to fill more than one program requirement.
- (2) Up to *12 from approved options may be taken from other faculties.
- (3) BIOL 298, 398, 399, 498, 499 and INTD 400 may count towards Science or approved options.
- (4) Credit in SCI 100 will be considered equivalent to BIOL 107, 108; CHEM 101, 102, 261; MATH 114, *3 Science options and *6 approved options.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD – <i>Pharmacology</i>
Contact Person:	Dr James R Hammond (Associate Chair – Undergraduate)
Level of change (choose one only) [?]	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Type of change request (check all that apply) [?]	<input checked="" type="checkbox"/> Program <input type="checkbox"/> Regulation
For which term is this intended to take effect?	Fall 2023
Does this proposal have corresponding course changes? (Should be submitted at the same time)	Yes

Rationale

- 1. Introduction of new mandatory 300-level course.** A recent review of the Pharmacology BSc program led to the proposed development of a new 300-level course on drug disposition and metabolism (PMCOL 306). This core area of pharmacology was determined to be underdeveloped in our current program due to shifts in course content and focus over the years. With the introduction of this new mandatory course, we will be making the existing PMCOL 305 (Introduction of Drugs of Abuse) optional for our students to maintain the current mandatory course load. Many students will likely continue to choose PMCOL 305 as a Science Option regardless, as it is a very popular course.
- 2. Introduction of new 400-level courses.** The program review also highlighted the need for additional 400-level courses to broaden the options for our students. Therefore, three new 400-level courses (PMCOL 406, 408, 410) will be introduced, which reflect modern developments in pharmacology research and the therapeutic use of drugs.
- 3. Restructuring of our 400-level research courses and the requirements for our Honors Pharmacology BSc.** The goals and expectations of students in the Honors in Pharmacology BSc program have changed in the past few years. A subset of students is interested in pursuing graduate studies and possibly an academic career. These students will benefit from more intense research opportunities. A second subset of students are not particularly driven to wet-lab research work but would like to access other types of Pharmacology research. We are now restructuring the research project component of the Honors Pharmacology BSc to provide separate paths for each of these subsets of students. The current program requires the course PMCOL 498 which is a 6-credit two term course (PMCOL 498A and PMCOL 498B). This course lacks flexibility. It does not provide a way out for students who find that wet-lab research is not for them; they are forced to finish the two semesters to obtain credit. This structure does not serve best either of the two groups of students noted above. The change to two streams in the fourth year will benefit both students and faculty members of the Department. Some faculty members will have more options to mentor students in projects that do not involve wet-lab work (Stream B). Moreover, as Stream A requires double the credits and double the time spent in research courses than the current program, supervisors will be able to develop more significant, in-depth projects for the students. In addition, the increase in credit for the research courses will lead to a reduction in student enrolment in other 400 level Pharmacology courses. Due to their structure and mode of assessment, these 400 level courses work best with a restricted number of students. The significant increase in student enrolment in our programs has made this difficult to manage, especially in the context of faculty member retirements without replacement. The two

research stream approach in the fourth year of study has been proven extremely successful in honor programs comparable to Pharmacology, namely Physiology and Neuroscience.

4. **Modifications to the Specialization in Pharmacology BSc program to make it distinct from Stream B of the Honors Program.** Currently, students in the Specialization program can take both PMCOL 401 and 402 in their 4th year. This is now a research option in Stream B for the Honors students. To remove this overlap, students in the Specialization program may now take either PMCOL 401 or 402, not both. Likewise, to relieve pressure on the 300-level research courses, students in the Specialization program may take either PMCOL 301 or 302, not both.
5. Additions and deletions from the list of courses available to science students reflecting changes in course offerings over the past few years. This includes the removal of the PMCOL research courses (301, 302, 401, 402) as options for students outside of the pharmacology programs.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42498

Current

Honors in Pharmacology [Science]

The program leading to an Honors degree in Pharmacology prepares students for advanced study leading to academic or research careers.

Continuation and graduation in the Honors in Pharmacology program requires successful completion of 24 units with a minimum 3.0 GPA, a minimum 3.0 GPA on all Science courses taken and a minimum 3.0 GPA in PMCOL courses taken in each previous Fall/Winter with at least a grade of B- in each course.

Year 1

BIOL 107 - Introduction to Cell Biology
 CHEM 101 - Introductory University Chemistry I
 CHEM 102 - Introductory University Chemistry II

CHEM 164 - Organic Chemistry I OR
 CHEM 261 - Organic Chemistry I

STAT 151 - Introduction to Applied Statistics I

6 units in Arts options ENGL recommended
 9 units in Science options from BIOCH, BIOL, CELL, CHEM, GENET, MATH, MICRB, PHYS, PHYSL, PMCOL, STAT or ZOOL

Proposed

Honors in Pharmacology [Science]

The program leading to an Honors degree in Pharmacology prepares students for advanced study leading to academic or research careers.

Continuation and graduation in the Honors in Pharmacology program requires successful completion of 24 units with a minimum 3.0 GPA, a minimum 3.0 GPA on all Science courses taken and a minimum 3.0 GPA in PMCOL courses taken in each previous Fall/Winter with at least a grade of B- in each course.

Year 1

BIOL 107 - Introduction to Cell Biology
 CHEM 101 - Introductory University Chemistry I
 CHEM 102 - Introductory University Chemistry II

CHEM 164 - Organic Chemistry I OR
 CHEM 261 - Organic Chemistry I

STAT 151 - Introduction to Applied Statistics I

6 units in Arts options ENGL recommended
 9 units in Science options from BIOCH, BIOL, CELL, CHEM, GENET, MATH, MICRB, PHYS, PHYSL, PMCOL, STAT or ZOOL

Year 2

BIOCH 200 - Introductory Biochemistry
CHEM 263 - Organic Chemistry II

PHYSL 210 - Human Physiology OR
PHYSL 212 - Human Physiology I
AND
PHYSL 214 - Human Physiology II

PMCOL 200 - Drugs - An Introduction to Pharmacology

9 units in Science options as indicated in Year 1
6 units in Arts options

Year 3

PMCOL 303 - Introduction to Toxicology
~~PMCOL 305 - An Introduction to the Pharmacology of Drug Abuse~~
PMCOL 337 - Experimental Procedures in Pharmacology
PMCOL 343 - Scientific Basis of Pharmacology: Part I
PMCOL 344 - Scientific Basis of Pharmacology: Part II

BIOCH 320 - Structure and Catalysis

6 units in Science options as indicated in Year 1
3 units in Arts options
3 units in approved options

Year 4

PMCOL 425 - Problem Solving in Pharmacology and Therapeutics
~~PMCOL 498 - Pharmacology Research Program~~

9 units from the following:

~~PMCOL 403 - Advanced Topics in Pharmacology~~
PMCOL 404 - Core Principles in Pharmacology
PMCOL 412 - Drugs and the Nervous System
PMCOL 415 - Cardiovascular Pharmacology
~~PMCOL 416 - Current Topics in Endocrine Pharmacology~~
~~PMCOL 425 - Problem Solving in Pharmacology and Therapeutics~~
PMCOL 450 - Diabetes and Its Pharmacotherapy
PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Options
3 units in Arts options

Year 2

BIOCH 200 - Introductory Biochemistry
CHEM 263 - Organic Chemistry II

PHYSL 210 - Human Physiology OR
PHYSL 212 - Human Physiology I
AND
PHYSL 214 - Human Physiology II

PMCOL 200 - Drugs - An Introduction to Pharmacology

9 units in Science options as indicated in Year 1
6 units in Arts options

Year 3

PMCOL 303 - Introduction to Toxicology
~~PMCOL 305 - An Introduction to the Pharmacology of Drug Abuse~~
~~PMCOL 306 - Drug Disposition and Metabolism~~
PMCOL 337 - Experimental Procedures in Pharmacology
PMCOL 343 - Scientific Basis of Pharmacology: Part I
PMCOL 344 - Scientific Basis of Pharmacology: Part II

BIOCH 320 - Structure and Catalysis

6 units in Science options as indicated in Year 1
3 units in Arts options
3 units in approved options

Year 4

Stream A (Undergraduate Honors Thesis in Pharmacology)

~~PMCOL 497 - Honors Research Project in Pharmacology I~~
~~PMCOL 499 - Honors Research Project in Pharmacology II~~
PMCOL 425 - Problem Solving in Pharmacology and Therapeutics

3 units from the following:

PMCOL 404 - Core Principles in Pharmacology
~~PMCOL 406 - Molecular Mechanisms of Drug Action~~
~~PMCOL 408 - Clinical Pharmacology~~
~~PMCOL 410 - Pharmacogenomics~~
PMCOL 412 - Drugs and the Nervous System
PMCOL 415 - Cardiovascular Pharmacology

6 units in Science option as indicated in Year 1
3 units in approved options

Notes

Students must consult the Chair of the Department or designee for approval of the selection of options.

Students will not be permitted to take 400-level pharmacology courses unless all prerequisites have been met.

Credit in SCI 100 will be considered equivalent to BIOL 107, BIOL 108, CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115 and 6 units in Science options (see details of courses).

Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units in Science option.

Students who take PMCOL 498 may not take PMCOL 401 or PMCOL 402.

Recommended Science options: BIOCH 310, BIOCH 330, BIOCH 401, BIOCH 410, BIOCH 420, BIOCH 430, BIOCH 441, BIOCH 450, CHEM 211, CHEM 213, CHEM 313, CHEM 419, GENET 270, GENET 301, GENET 304, GENET 390, GENET 408, MATH 114, MATH 115, PHYSL 372, PHYSL 401, PHYSL 402, PHYSL 403, PHYSL 404, PMCOL 301, PMCOL 302, PMCOL 371, STAT 252.

PMCOL 450 - Diabetes and Its Pharmacotherapy
PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Options

3 units in Arts options

6 units in Science options as indicated in Year 1

3 units in approved options

OR

Stream B (Non-Thesis Based Honors in Pharmacology)

PMCOL 425 - Problem Solving in Pharmacology and Therapeutics

6 units from the following:

PMCOL 401 - Pharmacology Tutorial

PMCOL 402 - Pharmacology Tutorial

PMCOL 403 - Advanced Topics in Pharmacology

9 units from the following:

PMCOL 401 - Pharmacology Tutorial

PMCOL 402 - Pharmacology Tutorial

PMCOL 403 - Advanced Topics in Pharmacology

PMCOL 404 - Core Principles in Pharmacology

PMCOL 406 - Molecular Mechanisms of Drug Action

PMCOL 408 - Clinical Pharmacology

PMCOL 410 - Pharmacogenomics

PMCOL 412 - Drugs and the Nervous System

PMCOL 415 - Cardiovascular Pharmacology

PMCOL 450 - Diabetes and Its Pharmacotherapy

PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Options

3 units in Arts options

6 units in Science options as indicated in Year 1

3 units in approved options

Notes

1. Students must consult the Chair of the Department or designee for approval of the selection of options.
2. Students will not be permitted to take 400-level pharmacology courses unless all prerequisites have been met.

3. Credit in SCI 100 will be considered equivalent to BIOL 107, BIOL 108, CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115 and 6 units in Science options (see details of courses).
4. Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units in Science option.
5. Students who take PMCOL 497 and 499 may not take PMCOL 401 or PMCOL 402.
6. At least one of PMCOL 301, 302, or comparable research experience, is a prerequisite for Honors Stream A
7. Some courses appear in more than one list of courses. Students may not use the same course to satisfy more than one requirement.
8. Recommended Science options: BIOCH 310, BIOCH 330, BIOCH 401, BIOCH 410, BIOCH 420, BIOCH 430, BIOCH 441, BIOCH 450, CHEM 211, CHEM 213, CHEM 313, CHEM 419, GENET 270, GENET 301, GENET 304, GENET 390, GENET 408, MATH 114, MATH 115, PHYSL 372, PHYSL 401, PHYSL 402, PHYSL 403, PHYSL 404, PMCOL 301, PMCOL 302, PMCOL 305, PMCOL 371, STAT 252.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42550

Current

Specialization in Pharmacology [Science]

The program leading to a Specialization degree in Pharmacology is for students who want to pursue further studies in the health sciences and those who want to prepare for a career in the pharmaceutical industry. Although not as rigorous as an Honors program, the Specialization program is a solid background for advanced study leading to a career in academia or research.

Proposed

Specialization in Pharmacology [Science]

The program leading to a Specialization degree in Pharmacology is for students who want to pursue further studies in the health sciences and those who want to prepare for a career in the pharmaceutical industry. Although not as rigorous as an Honors program, the Specialization program is a solid background for advanced study leading to a career in academia or research.

Continuation and graduation in the Specialization in Pharmacology program requires successful completion of at least 24 units with a minimum 2.7 GPA, a minimum 2.7 GPA on all Science courses taken and a minimum 2.7 GPA on all PMCOL courses taken in each previous Fall/Winter.

Year 1

BIOL 107 - Introduction to Cell Biology
CHEM 101 - Introductory University Chemistry I
CHEM 102 - Introductory University Chemistry II

CHEM 164 - Organic Chemistry I OR
CHEM 261 - Organic Chemistry I

STAT 151 - Introduction to Applied Statistics I

6 units in Arts options ENGL recommended
9 units in Science options from BIOCH, BIOL, CELL,
CHEM, GENET, MATH, MICRB, PHYS, PHYSL, PMCOL,
STAT or ZOOL

Year 2

BIOCH 200 - Introductory Biochemistry
CHEM 263 - Organic Chemistry II

PHYSL 210 - Human Physiology OR
PHYSL 212 - Human Physiology I
AND
PHYSL 214 - Human Physiology II

PMCOL 200 - Drugs - An Introduction to Pharmacology

6 units in Arts options
9 units in Science options as indicated in Year 1

Year 3

PMCOL 303 - Introduction to Toxicology
~~PMCOL 305 - An Introduction to the Pharmacology of
Drug Abuse~~
PMCOL 337 - Experimental Procedures in Pharmacology
PMCOL 343 - Scientific Basis of Pharmacology: Part I
PMCOL 344 - Scientific Basis of Pharmacology: Part II

BIOCH 320 - Structure and Catalysis

6 units in Science options as indicated in Year 1

Continuation and graduation in the Specialization in Pharmacology program requires successful completion of at least 24 units with a minimum 2.7 GPA, a minimum 2.7 GPA on all Science courses taken and a minimum 2.7 GPA on all PMCOL courses taken in each previous Fall/Winter.

Year 1

BIOL 107 - Introduction to Cell Biology
CHEM 101 - Introductory University Chemistry I
CHEM 102 - Introductory University Chemistry II

CHEM 164 - Organic Chemistry I OR
CHEM 261 - Organic Chemistry I

STAT 151 - Introduction to Applied Statistics I

6 units in Arts options ENGL recommended
9 units in Science options from BIOCH, BIOL, CELL,
CHEM, GENET, MATH, MICRB, PHYS, PHYSL, PMCOL,
STAT or ZOOL

Year 2

BIOCH 200 - Introductory Biochemistry
CHEM 263 - Organic Chemistry II

PHYSL 210 - Human Physiology OR
PHYSL 212 - Human Physiology I
AND
PHYSL 214 - Human Physiology II

PMCOL 200 - Drugs - An Introduction to Pharmacology

6 units in Arts options
9 units in Science options as indicated in Year 1

Year 3

PMCOL 303 - Introduction to Toxicology
~~PMCOL 305 - An Introduction to the Pharmacology of
Drug Abuse~~
PMCOL 306 - Drug Disposition and Metabolism
PMCOL 337 - Experimental Procedures in Pharmacology
PMCOL 343 - Scientific Basis of Pharmacology: Part I
PMCOL 344 - Scientific Basis of Pharmacology: Part II

BIOCH 320 - Structure and Catalysis

6 units in Science options as indicated in Year 1
3 units in Arts options

3 units in Arts options
3 units in approved options

Year 4

12 units from the following:

PMCOL 403 - Advanced Topics in Pharmacology
PMCOL 404 - Core Principles in Pharmacology
PMCOL 412 - Drugs and the Nervous System
PMCOL 415 - Cardiovascular Pharmacology
PMCOL 416 - Current Topics in Endocrine Pharmacology
PMCOL 425 - Problem Solving in Pharmacology and Therapeutics
PMCOL 450 - Diabetes and Its Pharmacotherapy
PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Options

6 units in Science option as indicated in Year 1
3 units in Arts options
9 units in approved options

Notes

1. Students must consult the Chair of the Department or designee for approval of the selection of options. Students will not be permitted to take 400-level pharmacology courses unless all prerequisites have been met.
2. Credit in SCI 100 will be considered equivalent to BIOL 107, BIOL 108, CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115 and 6 units in Science options (see details of courses).
3. Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units in Science options.
4. Recommended Science options: BIOCH 310, BIOCH 330, BIOCH 401, BIOCH 410, BIOCH 420, BIOCH 430, BIOCH 441, BIOCH 450, CHEM 211, CHEM 213, CHEM 313, CHEM 419, GENET 270, GENET 301, GENET 304, GENET 390, GENET 408, MATH 113, or MATH 114 and MATH 115, PHYSL 372, PHYSL 401, PHYSL 402, PHYSL 403, PHYSL 404, PMCOL 301, PMCOL 302, PMCOL 371, STAT 252.
5. The following courses may be used by students in the Faculty of Science as science courses: PMCOL 201, PMCOL 202, PMCOL 303, PMCOL 305, PMCOL 337, PMCOL 343, PMCOL 344, PMCOL 371, PMCOL 401, PMCOL 402, PMCOL 412, PMCOL 415, PMCOL 416, PMCOL 425, PMCOL 450, PMCOL 475 and PMCOL 498.

3 units in approved options

Year 4

12 units from the following:

PMCOL 403 - Advanced Topics in Pharmacology
PMCOL 404 - Core Principles in Pharmacology
PMCOL 406 - Molecular Mechanisms of Drug Action
PMCOL 408 - Clinical Pharmacology
PMCOL 410 - Pharmacogenomics
PMCOL 412 - Drugs and the Nervous System
PMCOL 415 - Cardiovascular Pharmacology
PMCOL 425 - Problem Solving in Pharmacology and Therapeutics
PMCOL 450 - Diabetes and Its Pharmacotherapy
PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Options

6 units in Science option as indicated in Year 1
3 units in Arts options
9 units in approved options

Notes

1. Students must consult the Chair of the Department or designee for approval of the selection of options. Students will not be permitted to take 400-level pharmacology courses unless all prerequisites have been met.
2. Credit in SCI 100 will be considered equivalent to BIOL 107, BIOL 108, CHEM 101, CHEM 102, CHEM 164, MATH 114, MATH 115 and 6 units in Science options (see details of courses).
3. Credit in SCI 151 will be considered equivalent to STAT 151 and 3 units in Science options.
4. Recommended Science options: BIOCH 310, BIOCH 330, BIOCH 401, BIOCH 410, BIOCH 420, BIOCH 430, BIOCH 441, BIOCH 450, CHEM 211, CHEM 213, CHEM 313, CHEM 419, GENET 270, GENET 301, GENET 304, GENET 390, GENET 408, MATH 113, or MATH 114 and MATH 115, PHYSL 372, PHYSL 401, PHYSL 402, PHYSL 403, PHYSL 404, PMCOL 301 OR PMCOL 302, PMCOL 305, PMCOL 371, PMCOL 401 OR PMCOL 402, STAT 252.
5. The following courses may be used by students in the Faculty of Science as science courses: PMCOL 200, PMCOL 303, PMCOL 305, PMCOL 306, PMCOL 337, PMCOL 343, PMCOL 344, PMCOL 371, PMCOL 406, PMCOL 408, PMCOL

	410, PMCOL 412, PMCOL 415, PMCOL 425, PMCOL 450, and PMCOL 475.
--	--

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs. Faculty Approval: October 7, 2022
--

Other consultation groups, departments, or internal faculty approving bodies and approval dates. Departmental Approval – Sep 9, 2022



Faculty (& Department or Academic Unit):	Faculty of Science, Department of Mathematical & Statistical Sciences
Contact Person:	Feng Dai, Associate Chair (Graduate)
Level of change: (choose one only)	<input type="checkbox"/> Undergraduate
	<input checked="" type="checkbox"/> Graduate
Type of change request: (check all that apply)	<input checked="" type="checkbox"/> Program
	<input type="checkbox"/> Regulation
For which term is this intended to take effect?	Fall 2023
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No

Rationale

Things to consider (maximum 500 words): Why is this being changed; How will it benefit students/department/unit; How is this comparable to similar programs (internal or external); Historical context; Impacts to administration or program structure; Consultation with stakeholders

- The number of elective courses on the current list is too limited and may not offer enough open courses in one term for MDP students. We want the approval of course selections outside the list at the department level by the Associate Chair (Graduate).

Calendar Copy

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42654&returnto=11393	
Current Copy: Removed language	Proposed Copy: New language
<p>The Degree of MSc with a specialization in Modelling, Data and Predictions (Mathematical and Statistical Sciences) [Graduate]</p> <p>Program Requirements</p> <p>Students are required to complete a minimum of 30 units in graduate-level coursework, including a 6-unit capping project.</p> <p>Coursework (24 units)</p> <ul style="list-style-type: none"> MATH 509 MATH 572 <u>STAT 513</u> STAT 537 STAT 541 	<p>The Degree of MSc with a specialization in Modelling, Data and Predictions (Mathematical and Statistical Sciences) [Graduate]</p> <p>Program Requirements</p> <p>Students are required to complete a minimum of 30 units in graduate-level coursework, including a 6-unit capping project.</p> <p>Coursework (24 units)</p> <ul style="list-style-type: none"> MATH 509 MATH 572 <u>STAT 513</u> STAT 537 STAT 541

<ul style="list-style-type: none">• Three 3-unit courses chosen from the following:<ul style="list-style-type: none">○ MATH 508○ MATH 524○ MATH 535○ MATH 570○ MATH 667○ STAT 553○ STAT 575○ STAT 578○ STAT 637○ BIOL 570• Additional coursework may be required.	<ul style="list-style-type: none">• Electives: 9 units chosen from the following:<ul style="list-style-type: none">○ MATH 508○ MATH 524○ MATH 535○ MATH 570○ MATH 667○ STAT 553○ STAT 575○ STAT 578○ STAT 637○ BIOL 570• Additional coursework may be required. <p>Other related graduate courses are acceptable as elective upon recommendation by a Faculty Mentor and approved by the Associate Chair (Graduate).</p>
--	--

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date. ACG - Faculty of Science September 29, 2022
OPTIONAL: Unanimously approved by the Department Council of Mathematical and Statistical Sciences on September 6, 2022.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Bachelor of Science General program requirements page is being updated to reflect the removal of specific course load requirements for all programs in the Faculty of Science.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42373&returnto=11345	
<p>Current</p> <p>Bachelor of Science General</p> <p>Return to: Faculty of Science - Programs</p> <p>General Information</p> <p>The BSc General program provides students with a diverse education in more than one branch of study. Students must major in a Science subject area of concentration (as defined either by a single course designator or by groupings of course designators – see below). Students may elect to minor in a Science subject area of concentration, in an Arts subject area of concentration (see Bachelor of Arts), in one of a select number of Agricultural, Life and Environmental Sciences subject areas of concentration (see BSc General—Minor in Agricultural,</p>	<p>Proposed</p> <p>Bachelor of Science General</p> <p>Return to: Faculty of Science - Programs</p> <p>General Information</p> <p>The BSc General program provides students with a diverse education in more than one branch of study. Students must major in a Science subject area of concentration (as defined either by a single course designator or by groupings of course designators – see below). Students may elect to minor in a Science subject area of concentration, in an Arts subject area of concentration (see Bachelor of Arts), in one of a select number of Agricultural, Life and Environmental Sciences subject areas of concentration (see BSc General—Minor in Agricultural,</p>

[Life and Environmental Sciences](#)), or in Business (see [BSc General—Minor in Business](#)). In addition to providing a path to the BSc General Degree, this program of study allows for subsequent transfer to Specialization and Honors programs. Students intending to transfer to Honors or Specialization programs should consult the appropriate admission requirements for the program of interest (see [Faculty of Science Admission Requirements](#)), select carefully their first-year core courses in accordance with the requirements of the specific Honors or Specialization program, and pay close attention to **course load and** GPA requirements for transfer. Students in the combined BSc/BEd program should consult [Bachelor of Education in Secondary Education](#) when choosing courses for their major and minor.

Admission

See [BSc General Admission Requirements](#) for admission requirements for the BSc (General) programs.

For information about admission to the Business minor, see [BSc General—Minor in Business](#).

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see [High School Admission](#) for more information.

Course Load Requirements

Students in the General program should normally take 30 units during the Fall/Winter of each year of the program if they wish to complete the program in four years. Although not held to a minimum Fall/Winter course load requirement while registered in the General program, students intending to transfer to an Honors or Specialization program should pay close attention to course load and GPA requirements for transfer to their program of interest.

Academic Standing and Graduation

The following regulations govern General Programs: To obtain a BSc General degree, a minimum 2.0 GPA must be attained on the last 60 units credited to the degree. Moreover, a minimum 2.3 GPA must be attained in all

[Life and Environmental Sciences](#)), or in Business (see [BSc General—Minor in Business](#)). In addition to providing a path to the BSc General Degree, this program of study allows for subsequent transfer to Specialization and Honors programs. Students intending to transfer to Honors or Specialization programs should consult the appropriate admission requirements for the program of interest (see [Faculty of Science Admission Requirements](#)), select carefully their first-year core courses in accordance with the requirements of the specific Honors or Specialization program, and pay close attention to GPA requirements for transfer. Students in the combined BSc/BEd program should consult [Bachelor of Education in Secondary Education](#) when choosing courses for their major and minor.

Admission

See [BSc General Admission Requirements](#) for admission requirements for the BSc (General) programs.

For information about admission to the Business minor, see [BSc General—Minor in Business](#).

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see [High School Admission](#) for more information.

Course Load Requirements

The BSc General degree is designed to be a four-year program. To graduate in four years, students should take a full course load of 30 units in each Fall/Winter of the program. Students may meet degree requirements in a shorter time by attending Spring/Summer. Students may extend their program beyond four years by taking a reduced course load.

Academic Standing and Graduation

The following regulations govern General Programs: To obtain a BSc General degree, a minimum 2.0 GPA must be attained on the last 60 units credited to the degree. Moreover, a minimum 2.3 GPA must be attained in all

courses in the major. Students must be in Satisfactory Standing in the General program in order to graduate (a minimum 2.0 GPA in the final Fall/Winter). BSc General degrees With Distinction are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

Time Limits for Program Completion

The Faculty of Science may permit a student to complete the requirements for a General degree over a period longer than four years or meet the requirements in a shorter time by attending Spring/Summer. Students wishing to extend their programs beyond four years must first obtain approval of the Senior Associate Dean of Science or designate:

-
-
-

courses in the major. Students must be in Satisfactory Standing in the General program in order to graduate (a minimum 2.0 GPA in the final Fall/Winter). BSc General degrees With Distinction are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

-
-
-

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
 Faculty Approval: October 7, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Bachelor of Science Honors program requirements page is being updated to reflect the removal of specific course load requirements for all programs in the Faculty of Science.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42307&returnto=11345	
<p>Current</p> <p>Bachelor of Science Honors</p> <p>← Return to: Faculty of Science - Programs</p> <p>A minimum of 120 units normally taken in no more than five consecutive academic years is required to complete the Honors program for the degree of BSc with Honors. Some departments require that an Honors program be completed in four years, others permit five. See individual departments for details. These programs provide specialization in the chosen subject or subjects as well as the higher standard implied by the term "Honors."</p> <p>Honors programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Neuroscience,</p>	<p>Proposed</p> <p>Bachelor of Science Honors</p> <p>← Return to: Faculty of Science - Programs</p> <p>A minimum of 120 units, normally taken in four academic years, is required to complete the Honors program for the degree of BSc with Honors. These programs provide specialization in the chosen subject or subjects as well as the higher standard implied by the term "Honors."</p> <p>Honors programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Neuroscience,</p>

Pharmacology, Physics, Physiology, and Psychology. Honors is the preferred program for students who plan graduate study.

Admission

See [BSc \(Honors\)](#) for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Honors programs:

1. In each year, an Honors student's program must be approved by an Honors Advisor in the student's Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Honors programs. Certain Departments may require more than 72 units in Science courses.
3. A student normally must take at least 18 units in Arts courses as part of the requirements for the Honors degree.
4. Normally, no more than 42 units in junior (100-level) courses are permitted in Honors programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Honors programs with the written approval of the Department directing the student's program.

Applicants to the BSc Honors program who have taken non-Arts and non-Science courses before application will have the potential to transfer credit for such courses assessed at the time of admission to the program.

Course Load Requirements

Students in Honors programs must complete 24 units or more during the Fall/Winter of each year of the program. In some Departments, Honors students are required to complete 30 units each Fall/Winter. See individual Departments for details. Exceptions to course load requirements must be approved in advance each year by the Department and the Faculty Office.

Pharmacology, Physics, Physiology, and Psychology. Honors is the preferred program for students who plan graduate study.

Admission

See [BSc \(Honors\)](#) for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Honors programs:

1. In each year, an Honors student's program must be approved by an Honors Advisor in the student's Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Honors programs. Certain Departments may require more than 72 units in Science courses.
3. A student normally must take at least 18 units in Arts courses as part of the requirements for the Honors degree.
4. Normally, no more than 42 units in junior (100-level) courses are permitted in Honors programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Honors programs with the written approval of the Department directing the student's program.

Applicants to the BSc Honors program who have taken non-Arts and non-Science courses before application will have the potential to transfer credit for such courses assessed at the time of admission to the program.

Course Load Requirements

The BSc Honors degree is designed to be a four-year program. To graduate in four years, students should take a full course load of 30 units in each Fall/Winter of the program. Students may meet degree requirements in a shorter time by attending Spring/Summer. Students may extend their program beyond four years by taking a reduced course load.

Academic Standing and Graduation

The following regulations govern Honors programs:

1. Continuation in an Honors program is by recommendation of the department concerned and requires a GPA of at least 3.0 on a course load of 24 units or more in the preceding Fall/Winter periods. See description of Honors programs of individual departments for additional requirements relating to continuation in the Honors program. Students must be in good standing (i.e., meet the continuation requirements) in the Honors program in order to graduate.
2. A student who fails to attain the standard necessary for continuance in Honors must withdraw from the Honors program. In so doing, the student may transfer to a Specialization program with the appropriate department's approval or to the General program in the Faculty of Science. Students applying to transfer from an Honors program to Specialization or General must meet the continuation standards for the program concerned.
3. A student who fails to complete the requirements for a degree with Honors in the fourth year may be granted the Specialization degree or the General degree on application if the courses taken and the standing attained are satisfactory. Such students must apply to transfer to a Specialization or General program.
 1. First-Class Honors Degrees are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

Academic Standing and Graduation

The following regulations govern Honors programs:

1. Continuation in an Honors program is by recommendation of the department concerned and requires a GPA of at least 3.0 in the preceding Fall/Winter periods. See description of Honors programs of individual departments for additional requirements relating to continuation in the Honors program. Students must be in good standing (i.e., meet the continuation requirements) in the Honors program in order to graduate.
2. A student who fails to attain the standard necessary for continuance in Honors must withdraw from the Honors program. In so doing, the student may transfer to a Specialization program with the appropriate department's approval or to the General program in the Faculty of Science. Students applying to transfer from an Honors program to Specialization or General must meet the continuation standards for the program concerned.
3. A student who fails to complete the requirements for a degree with Honors in the last year may be granted the Specialization degree or the General degree on application if the courses taken and the standing attained are satisfactory. Such students must apply to transfer to a Specialization or General program.
 4. First-Class Honors Degrees are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

Time Limits for Program Completion

All BSc Honors programs are designed to be four-year programs. However, in some cases the minimum course load requirements have been reduced to allow students the flexibility to complete the degree over a longer time period. Students wishing to extend their programs beyond the time frame dictated by the minimum course load requirement for their program must first obtain the written approval of the Department and the Associate Dean, Undergraduate or designate.

BSc Honors Requirements

- [Honors in Biochemistry](#)

Honors in Biochemistry [Science]

Continuation in the Honors in Biochemistry program requires **successful completion of at least 24 units with** a minimum GPA of 3.0 in the previous Fall/Winter. In addition, graduation from the program requires a minimum GPA of 3.0 on the last 60 units credited towards the degree.

-
-
-

- [Honors in Biological Sciences](#)

Honors in Biological Sciences [Science]

All students in Honors and Specialization programs in Biological Science take a common core of four BIOL courses in the first and second years. Thereafter, they follow the course sequence of one of the areas of concentration in either Honors or Specialization in Biological Sciences identified in **Science Chart 2 Course Sequence in Biological Sciences**. At the time of application, students indicate their chosen area of concentration on the application; if admitted, they follow the appropriate course sequence. The title of the area of concentration will appear on their degree. Additional course requirements for Honors students include

BSc Honors Requirements

- [Honors in Biochemistry](#)

Honors in Biochemistry [Science]

Continuation in the Honors in Biochemistry program requires a minimum GPA of 3.0 in the previous Fall/Winter. In addition, graduation from the program requires a minimum GPA of 3.0 on the last 60 units credited towards the degree.

-
-
-

- [Honors in Biological Sciences](#)

Honors in Biological Sciences [Science]

All students in Honors and Specialization programs in Biological Science take a common core of four BIOL courses in the first and second years. Thereafter, they follow the course sequence of one of the areas of concentration in either Honors or Specialization in Biological Sciences identified in **Course Sequence in Biological Sciences**. At the time of application, students indicate their chosen area of concentration on the application; if admitted, they follow the appropriate course sequence. The title of the area of concentration will appear on their degree. Additional course requirements for Honors students include [BIOL 499](#) and program specific

[BIOL 499](#) and program specific courses. [BIOL 499](#), a directed research project, must be conducted on a topic appropriate to the student's area of concentration. [BIOL 499](#) is a recommended option for Specialization students.

Streams have been developed within Biological Sciences. These are lists of courses that provide guidance to students wishing to focus further on specific areas of Biology. Students in a program are not required to declare or follow a stream, and stream designations do not appear on transcripts. Streams are described in full on the Department of Biological Sciences website. Students should consult with advisors in choosing and following streams within their programs.

Honors in Biological Sciences

Admission to the BSc Honors in Biological Sciences program see [Admissions Chart 7: Science Specialization and Honors Requirements](#), Faculty of Science.

Continuation in the Honors in Biological Sciences program requires **successful completion of at least 24 units with** a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

-
-
-

Course Sequence in Biological Sciences

- [Ecology, Evolution and Environmental Biology](#)
- [Integrative Physiology](#)
- [Molecular, Cellular and Developmental Biology](#)

Suspended Areas of Concentration

Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in:

- Animal Biology
- Evolutionary Biology
- Microbiology
- Plant Biology.

courses. [BIOL 499](#), a directed research project, must be conducted on a topic appropriate to the student's area of concentration. [BIOL 499](#) is a recommended option for Specialization students.

Streams have been developed within Biological Sciences. These are lists of courses that provide guidance to students wishing to focus further on specific areas of Biology. Students in a program are not required to declare or follow a stream, and stream designations do not appear on transcripts. Streams are described in full on the Department of Biological Sciences website. Students should consult with advisors in choosing and following streams within their programs.

Honors in Biological Sciences

Admission to the BSc Honors in Biological Sciences program see [Admissions Chart 7: Science Specialization and Honors Requirements](#), Faculty of Science.

Continuation in the Honors in Biological Sciences program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

-
-
-

Course Sequence in Biological Sciences

- [Ecology, Evolution and Environmental Biology](#)
- [Integrative Physiology](#)
- [Molecular, Cellular and Developmental Biology](#)

Suspended Areas of Concentration

Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in:

- Animal Biology
- Evolutionary Biology
- Microbiology
- Plant Biology.

Students who entered one of these programs prior to September 2017 must complete all program requirements by April 30, 2024. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in these concentrations will be granted at Spring Convocation 2024.

-
-
-

- [Honors in Cell Biology](#)

Honors in Cell Biology [Science]

Continuation in the Honors in Cell Biology program requires **successful completion of at least 24 units with** a minimum 3.0 GPA in each preceding Fall/Winter.

-
-
-

- [Honors in Chemistry](#)

Honors in Chemistry [Science]

Honors students in Chemistry must take a core of Chemistry and auxiliary courses. The core consists of 45 units in Chemistry courses, 12 units in Mathematics courses, 6 units in Physics courses, 3 units in [BIOCH 200](#), 3 units in [CHEM 401](#), 6 units in a junior ENGL or 3 units in ENGL and 3 units in Arts option, and 12 units in Arts options. In addition to the core courses, honors students must complete at least 18 units in senior courses in Chemistry from the courses listed below, with 6 units of these taken at the 400-level. Finally, the honors student must include 15 units in options in the third and fourth years of the program. These are normally chosen from offerings within the Faculty of Science (see [details of courses](#)). All options must be selected in consultation with the Department of Chemistry.

Continuation in the Honors in Chemistry program requires **successful completion of at least 24 units with** a minimum 3.0 GPA and a minimum 3.0 GPA on

Students who entered one of these programs prior to September 2017 must complete all program requirements by April 30, 2024. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in these concentrations will be granted at Spring Convocation 2024.

-
-
-

- [Honors in Cell Biology](#)

Honors in Cell Biology [Science]

Continuation in the Honors in Cell Biology program requires a minimum 3.0 GPA in each preceding Fall/Winter.

-
-
-

- [Honors in Chemistry](#)

Honors in Chemistry [Science]

Honors students in Chemistry must take a core of Chemistry and auxiliary courses. The core consists of 45 units in Chemistry courses, 12 units in Mathematics courses, 6 units in Physics courses, 3 units in [BIOCH 200](#), 3 units in [CHEM 401](#), 6 units in a junior ENGL or 3 units in ENGL and 3 units in Arts option, and 12 units in Arts options. In addition to the core courses, honors students must complete at least 18 units in senior courses in Chemistry from the courses listed below, with 6 units of these taken at the 400-level. Finally, the honors student must include 15 units in options in the third and fourth years of the program. These are normally chosen from offerings within the Faculty of Science (see [details of courses](#)). All options must be selected in consultation with the Department of Chemistry.

Continuation in the Honors in Chemistry program requires a minimum 3.0 GPA and a minimum 3.0 GPA on all CHEM courses completed in the previous

all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.

The Honors Chemistry degree is accredited by the Canadian Society for Chemistry.

-
-
-

- [Honors in Computing Science](#)

Honors in Computing Science [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Honors in Computing Science

The Honors program is directed to highly-motivated students with exceptional ability. It provides the opportunity for students to design their program for in-depth study of topics of interest. The Honors program has few specified requirements. Honors students must complete a minimum number of upper level courses (300-level or greater). This implies that they must take the required prerequisites in CMPUT, MATH, and other subjects. There is no set of required 200-level courses, and prerequisites in CMPUT courses can be waived for demonstrated competence in the subject. Programs that cross discipline and faculty boundaries are possible and encouraged.

Because the Honors program is very flexible, all students must obtain departmental guidance in developing their program. All course selections and changes require annual approval by a departmental advisor.

Honors students should keep in mind the degree

Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.

The Honors Chemistry degree is accredited by the Canadian Society for Chemistry.

-
-
-

- [Honors in Computing Science](#)

Honors in Computing Science [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Honors in Computing Science

The Honors program is directed to highly-motivated students with exceptional ability. It provides the opportunity for students to design their program for in-depth study of topics of interest. The Honors program has few specified requirements. Honors students must complete a minimum number of upper level courses (300-level or greater). This implies that they must take the required prerequisites in CMPUT, MATH, and other subjects. There is no set of required 200-level courses, and prerequisites in CMPUT courses can be waived for demonstrated competence in the subject. Programs that cross discipline and faculty boundaries are possible and encouraged.

Because the Honors program is very flexible, all students must obtain departmental guidance in developing their program. All course selections and changes require annual approval by a departmental advisor.

Honors students should keep in mind the degree

requirements for Specialization in case they can no longer continue in Honors.

Continuation in the Honors in Computing Science program requires **successful completion of at least 24 units with** a minimum 3.0 GPA and a minimum 3.0 GPA on all CMPUT courses completed in the previous Fall/Winter.

Graduation requires a minimum GPA of 3.0 GPA on the last 60 units credited to the degree, and 3.0 on all CMPUT courses credited to the degree.

Honors students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level or greater offered at the University of Alberta.

-
-
-

- [BSc Honors in Computing Science After an Undergraduate Degree \(other than a BSc from the Faculty of Science at the University of Alberta\)](#)

BSc Honors in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta) [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

BSc Honors in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta)

In addition to the requirements set out in [After Degrees](#), a student pursuing this designation must

requirements for Specialization in case they can no longer continue in Honors.

Continuation in the Honors in Computing Science program requires a minimum 3.0 GPA and a minimum 3.0 GPA on all CMPUT courses completed in the previous Fall/Winter.

Graduation requires a minimum GPA of 3.0 GPA on the last 60 units credited to the degree, and 3.0 on all CMPUT courses credited to the degree.

Honors students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level or greater offered at the University of Alberta.

-
-
-

- [BSc Honors in Computing Science After an Undergraduate Degree \(other than a BSc from the Faculty of Science at the University of Alberta\)](#)

BSc Honors in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta) [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

BSc Honors in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta)

In addition to the requirements set out in [After Degrees](#), a student pursuing this designation must

also complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta as part of their 60 units.

-
-
-

- [Honors in Environmental Earth Sciences](#)

Honors in Environmental Earth Sciences [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Honors in Environmental Earth Sciences

Environmental Earth Science is the study of interactions between humans and Earth's natural environment. It encompasses the influence of human activities on the local and global environment, as well as how our actions are shaped and controlled by the geologic and geomorphic processes occurring around us. Environmental Earth Scientists are typically employed by consulting companies, large resource and industrial firms, and government organizations.

Continuation in the Honors in Environmental Earth Sciences program requires **successful completion of at least 24 units with** a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

A student enrolling in the Honors program should confer with the Environmental Earth Sciences Program student advisor before registration each year.

-

also complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta as part of their 60 units.

-
-
-

- [Honors in Environmental Earth Sciences](#)

Honors in Environmental Earth Sciences [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Honors in Environmental Earth Sciences

Environmental Earth Science is the study of interactions between humans and Earth's natural environment. It encompasses the influence of human activities on the local and global environment, as well as how our actions are shaped and controlled by the geologic and geomorphic processes occurring around us. Environmental Earth Scientists are typically employed by consulting companies, large resource and industrial firms, and government organizations.

Continuation in the Honors in Environmental Earth Sciences program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

A student enrolling in the Honors program should confer with the Environmental Earth Sciences Program student advisor before registration each year.

-

<ul style="list-style-type: none"> • • • Honors in Geology <p>Honors in Geology [Science]</p> <hr/> <p>Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.</p> <p>Honors in Geology</p> <hr/> <p>Geology is the study of the planet Earth—the materials it is made of, the processes which affect these materials, and the origin and evolution of life. Geologists are employed by companies engaged in exploration for and production of minerals and fuels, by government agencies, by companies engaged in engineering and environmental projects, and by universities.</p> <p>Continuation in the Honors in Geology program requires successful completion of at least 24 units with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.</p> <p>A student enrolling in the Honors program should consult the Geology program student advisor before registration each year.</p> <ul style="list-style-type: none"> • • • • Honors in Immunology and Infection <p>Honors in Immunology and Infection [Science]</p> <hr/>	<ul style="list-style-type: none"> • • • Honors in Geology <p>Honors in Geology [Science]</p> <hr/> <p>Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.</p> <p>Honors in Geology</p> <hr/> <p>Geology is the study of the planet Earth—the materials it is made of, the processes which affect these materials, and the origin and evolution of life. Geologists are employed by companies engaged in exploration for and production of minerals and fuels, by government agencies, by companies engaged in engineering and environmental projects, and by universities.</p> <p>Continuation in the Honors in Geology program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.</p> <p>A student enrolling in the Honors program should consult the Geology program student advisor before registration each year.</p> <ul style="list-style-type: none"> • • • • Honors in Immunology and Infection <p>Honors in Immunology and Infection [Science]</p> <hr/>
--	---

Continuation in the Honors in Immunology and Infection program requires **successful completion of at least 24 units with** a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

-
-
-

- [Honors in Mathematics](#)

Honors in Mathematics [Science]

Continuation in the Honors in Mathematics program requires **successful completion of at least 24 units with** a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

-
-
-

- [Honors in Applied Mathematics](#)

Honors in Applied Mathematics [Science]

Continuation in the Honors in Applied Mathematics program requires **successful completion of at least 24 units with** a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

Continuation in the Honors in Immunology and Infection program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.

-
-
-

- [Honors in Mathematics](#)

Honors in Mathematics [Science]

Continuation in the Honors in Mathematics program requires a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

-
-
-

- [Honors in Applied Mathematics](#)

Honors in Applied Mathematics [Science]

Continuation in the Honors in Applied Mathematics program requires a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

<ul style="list-style-type: none">•••• Honors in Statistics <p>Honors in Statistics [Science]</p> <hr/> <p>Continuation in the Honors Statistics program requires successful completion of at least 24 units with a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses, which should be taken in the years indicated:</p> <ul style="list-style-type: none">••• • Honors in Neuroscience <p>Honors in Neuroscience [Science]</p> <hr/> <p>The Honors program in Neuroscience is an interdisciplinary program coordinated by the Neuroscience and Mental Health Institute. This program is for students planning a career in Neuroscience.</p> <p>For admission to the Honors in Neuroscience program see Admissions Chart 7: Science Specialization and Honors Requirements, Faculty of Science.</p> <p>Neuroscience is a broadly based discipline covering all aspects of brain function. Some major areas are brain development, nerve cells and synapses, sensation and perception, learning and memory, control of movement, animal behavior, cognitive psychology, and disorders of the nervous system. The Honors program introduces the major areas of Neuroscience and allows students to explore topics of interest in their final year.</p>	<ul style="list-style-type: none">•••• Honors in Statistics <p>Honors in Statistics [Science]</p> <hr/> <p>Continuation in the Honors Statistics program requires a minimum 3.0 GPA and a minimum 3.0 GPA on all MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on all courses credited towards the degree and a minimum 3.0 GPA on all MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses, which should be taken in the years indicated:</p> <ul style="list-style-type: none">••• • Honors in Neuroscience <p>Honors in Neuroscience [Science]</p> <hr/> <p>The Honors program in Neuroscience is an interdisciplinary program coordinated by the Neuroscience and Mental Health Institute. This program is for students planning a career in Neuroscience.</p> <p>For admission to the Honors in Neuroscience program see Admissions Chart 7: Science Specialization and Honors Requirements, Faculty of Science.</p> <p>Neuroscience is a broadly based discipline covering all aspects of brain function. Some major areas are brain development, nerve cells and synapses, sensation and perception, learning and memory, control of movement, animal behavior, cognitive psychology, and disorders of the nervous system. The Honors program introduces the major areas of Neuroscience and allows students to explore topics of interest in their final year.</p>
---	--

Continuation in the Honors program requires a minimum GPA of 3.3 in each preceding Fall/Winter. Graduation requires a minimum GPA of 3.3 on 60 units in Years 3 and 4 of the program. Each program of study must be approved by the program coordinator in the Neuroscience and Mental Health Institute.

A full course load of 30 units per academic year must be maintained throughout each year of the Honors program. Courses cannot be deferred to the Spring/Summer Terms without prior permission of the program coordinator.

-
-
-

- [Honors in Paleontology](#)

Honors in Paleontology [Science]

Paleontology is a basic science concerned with the evolutionary history of life. Students are required to have a broad knowledge base of biological and geological knowledge. Areas of detailed knowledge will include vertebrate and invertebrate paleobiology, paleobotany, evolutionary biology, systematics, functional morphology, sedimentology, stratigraphy, and plate tectonics. Paleontologists usually hold advanced research degrees and work as research scientists and teachers in universities, museums, and industrial laboratories.

Honors in Paleontology

The Honors program is administered by the Departments of Earth and Atmospheric Sciences and Biological Sciences. The curriculum is drawn from both departments enabling students to develop a broad knowledge base that will prepare them for later entry into more specialized postgraduate studies in their selected paleontological discipline. Interested students should consult with an Honors program advisor to prepare their programs.

Continuation in the Honors in Paleontology program requires successful completion of at least 24 units

Continuation in the Honors program requires a minimum GPA of 3.3 in each preceding Fall/Winter. Graduation requires a minimum GPA of 3.3 on 60 units in Years 3 and 4 of the program. Each program of study must be approved by the program coordinator in the Neuroscience and Mental Health Institute.

-
-
-

- [Honors in Paleontology](#)

Honors in Paleontology [Science]

Paleontology is a basic science concerned with the evolutionary history of life. Students are required to have a broad knowledge base of biological and geological knowledge. Areas of detailed knowledge will include vertebrate and invertebrate paleobiology, paleobotany, evolutionary biology, systematics, functional morphology, sedimentology, stratigraphy, and plate tectonics. Paleontologists usually hold advanced research degrees and work as research scientists and teachers in universities, museums, and industrial laboratories.

Honors in Paleontology

The Honors program is administered by the Departments of Earth and Atmospheric Sciences and Biological Sciences. The curriculum is drawn from both departments enabling students to develop a broad knowledge base that will prepare them for later entry into more specialized postgraduate studies in their selected paleontological discipline. Interested students should consult with an Honors program advisor to prepare their programs.

Continuation in the Honors in Paleontology program requires a minimum 3.0 GPA in the previous

<p>with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Pharmacology <p>Honors in Pharmacology [Science]</p> <hr/> <p>The program leading to an Honors degree in Pharmacology prepares students for advanced study leading to academic or research careers. Continuation and graduation in the Honors in Pharmacology program requires successful completion of 24 units with a minimum 3.0 GPA, a minimum 3.0 GPA on all Science courses taken and a minimum 3.0 GPA in PMCOL courses taken in each previous Fall/Winter with at least a grade of B- in each course.</p> <ul style="list-style-type: none"> • • • • Honors in Physics <p>Honors in Physics [Science]</p> <hr/> <p>The Honors Programs offered by the Department of Physics provide a comprehensive education for students planning advanced degrees and a research or academic career.</p> <p>Students interested in the Engineering-Physics program should consult Engineering Physics of the Faculty of Engineering section.</p> <p>Honors Physics students must consult an advisor in the Department of Physics regarding their programs. Not all 200-, 300- and 400-level Physics and Geophysics courses are offered every year so students should plan accordingly.</p> <p>Continuation in the Honors in Physics program requires successful completion of at least 24 units with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA</p>	<p>Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 60 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Pharmacology <p>Honors in Pharmacology [Science]</p> <hr/> <p>The program leading to an Honors degree in Pharmacology prepares students for advanced study leading to academic or research careers. Continuation and graduation in the Honors in Pharmacology program requires a minimum 3.0 GPA, a minimum 3.0 GPA on all Science courses taken and a minimum 3.0 GPA in PMCOL courses taken in each previous Fall/Winter with at least a grade of B- in each course.</p> <ul style="list-style-type: none"> • • • • Honors in Physics <p>Honors in Physics [Science]</p> <hr/> <p>The Honors Programs offered by the Department of Physics provide a comprehensive education for students planning advanced degrees and a research or academic career.</p> <p>Students interested in the Engineering-Physics program should consult Engineering Physics of the Faculty of Engineering section.</p> <p>Honors Physics students must consult an advisor in the Department of Physics regarding their programs. Not all 200-, 300- and 400-level Physics and Geophysics courses are offered every year so students should plan accordingly.</p> <p>Continuation in the Honors in Physics program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to</p>
--	--

<p>on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Astrophysics <p>Honors in Astrophysics [Science]</p> <hr/> <p>Continuation in the Honors in Astrophysics program requires successful completion of at least 24 units with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Geophysics <p>Honors in Geophysics [Science]</p> <hr/> <p>Continuation in the Honors in Geophysics program requires successful completion of at least 24 units with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Mathematical Physics <p>Honors in Mathematical Physics [Science]</p> <hr/> <p>Continuation in the Honors in Mathematical Physics program requires successful completion of at least 24 units with a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p>	<p>the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Astrophysics <p>Honors in Astrophysics [Science]</p> <hr/> <p>Continuation in the Honors in Astrophysics program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Geophysics <p>Honors in Geophysics [Science]</p> <hr/> <p>Continuation in the Honors in Geophysics program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • Honors in Mathematical Physics <p>Honors in Mathematical Physics [Science]</p> <hr/> <p>Continuation in the Honors in Mathematical Physics program requires a minimum 3.0 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 3.0 GPA on the last 90 units credited to the degree.</p>
---	---

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty of Science is removing the course load requirements for Specialization and Honors programs for the 2023-2024 calendar year (and beyond for the new Major/Honors BSc degree framework coming into effect in Fall 2024). Course load limits are also being standardized across all BSc programs.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11200>

Current

Faculty of Science Regulations

Return to: [Faculty of Science](#)

- [Faculty Overview](#)
- [Degrees](#)
- [Admission](#)
- [Definitions](#)
- [Academic Standing](#)
- [Courses](#)
- [Graduation](#)
- [Appeals and Grievances](#)
- [Visiting Student Status](#)
- [Study Abroad](#)
- [Science Internship Program](#)

Faculty Overview

The Faculty of Science offers degrees in Applied Mathematics, Astrophysics, Biochemistry, Biological Sciences (Ecology, Evolution and Environmental Biology; Integrative Physiology; and Molecular, Cellular and Developmental Biology), Chemistry, Cell Biology, Computing Science, Computing Science with Business Minor, Environmental Earth Sciences, Geology, Geophysics, Immunology and Infection, Mathematical Physics, Mathematics, Mathematics (Computational Science) Mathematics and Economics, Mathematics and Finance, Neuroscience, Paleontology, Pharmacology, Physics, Physiology, Psychology, and Statistics.

A Business Minor, an Arts Minor and an Agricultural, Life and Environmental Sciences minor are available in the BSc General program.

A Science Internship Program (SIP) is available to Faculty of Science BSc students to enhance their studies and provide relevant work experience. Students must complete an 8-, 12- or 16- month work experience term at the end of their third year to receive SIP designation on their degree parchment. For more details, please see [Science Internship Program](#).

-
-
-

Proposed

Faculty of Science Regulations

Return to: [Faculty of Science](#)

- › [Faculty Overview](#)
- › [Degrees](#)
- › [Admission](#)
- › [Definitions](#)
- › [Academic Standing](#)
- › [Courses](#)
- › [Graduation](#)
- › [Appeals and Grievances](#)
- › [Visiting Student Status](#)
- › [Study Abroad](#)
- › [Science Internship Program](#)

Faculty Overview

The Faculty of Science offers degrees in Applied Mathematics, Astrophysics, Biochemistry, Biological Sciences (Ecology, Evolution and Environmental Biology; Integrative Physiology; and Molecular, Cellular and Developmental Biology), Chemistry, Cell Biology, Computing Science, Computing Science with Business Minor, Environmental Earth Sciences, Geology, Geophysics, Immunology and Infection, Mathematical Physics, Mathematics, Mathematics (Computational Science) Mathematics and Economics, Mathematics and Finance, Neuroscience, Paleontology, Pharmacology, Physics, Physiology, Psychology, and Statistics.

A Business Minor, an Arts Minor and an Agricultural, Life and Environmental Sciences minor are available in the BSc General program.

A Science Internship Program (SIP) is available to Faculty of Science BSc students to enhance their studies and provide relevant work experience. Students must complete an 8-, 12- or 16- month work experience term at the end of their third year to receive SIP designation on their degree parchment. For more details, please see [Science Internship Program](#).

-
-
-

<p>Academic Standing</p> <ul style="list-style-type: none"> • • • <p>3. Requirement to Withdraw and Readmission Students who are required to withdraw cannot continue or register in subsequent terms beyond Spring. If they wish to continue studies in the Faculty of Science, they must choose one of the following mutually exclusive options. Admission to the Faculty of Science is competitive. The number of readmissions to the Faculty is limited. Presentation of the minimum admissions requirements does not assure admission.</p> <p>a. Fresh Start Program: is available by recommendation of the Faculty to students whose GPA is between 1.3 and 1.6 and have taken less than 60 units of course weight of postsecondary work. Students who been on probation or have more than one requirement to withdraw or their equivalents, or who have been sanctioned for any academic-related disciplinary offence at this University or elsewhere are not eligible for the Fresh Start program. A minimum of 24 units of course weight with a competitive AGPA must be successfully completed in the Fresh Start program to be considered for readmission to the Faculty of Science. The Faculty may also specify course requirements to be fulfilled. Students who successfully complete the Fresh Start program may apply for readmission as transfer students (see Postsecondary Transfer Students).</p> <ul style="list-style-type: none"> • • • <p>Courses</p>	<p>Academic Standing</p> <ul style="list-style-type: none"> • • • <p>3. Requirement to Withdraw and Readmission Students who are required to withdraw cannot continue or register in subsequent terms beyond Spring. If they wish to continue studies in the Faculty of Science, they must choose one of the following mutually exclusive options. Admission to the Faculty of Science is competitive. The number of readmissions to the Faculty is limited. Presentation of the minimum admissions requirements does not assure admission.</p> <p>a. Fresh Start Program: is available by recommendation of the Faculty to students whose GPA is between 1.3 and 1.6 and have taken less than 60 units of course weight of postsecondary work. Students who have been on probation or have more than one requirement to withdraw or their equivalents, or who have been sanctioned for any academic-related disciplinary offence at this University or elsewhere are not eligible for the Fresh Start program. A minimum of 24 units of course weight with a competitive AGPA must be successfully completed in the Fresh Start program to be considered for readmission to the Faculty of Science. The Faculty may also specify course requirements to be fulfilled. Students who successfully complete the Fresh Start program may apply for readmission as transfer students (see Postsecondary Transfer Students).</p> <ul style="list-style-type: none"> • • • <p>Courses</p>
---	---

1. Selection of Courses

Students are responsible for familiarizing themselves with program requirements and limitations as specified in the Calendar, for ensuring their programs are properly planned in accordance with degree specifications, and for the completeness and accuracy of their registration. Please read the Calendar carefully before registering in courses, and if you are in doubt about any regulations pertaining to your program, consult the Faculty of Science Office (1-001 CCIS) for clarification.

Students registered in the Faculty of Science must complete Science courses and Arts courses as specified by their program. Students may also take courses from other Faculties, but must adhere to the program-imposed limits for such Outside options.

Note: Anatomy courses are offered by the Faculty of Medicine and are considered Outside options. **Written approval from the Faculty of Science is required if more than 30 units of course weight are taken in a Fall/Winter, except in those Honors and Specialization programs requiring more than 30 units of course weight in a given year.**

2. Selection of First-Year Courses

Beginning first-year students who have completed no credits toward their programs normally restrict their registration to junior courses. First year students contemplating taking senior level courses should be careful to ensure that they have completed any prerequisites.

3. Withdrawal from Courses

Courses from which the student withdraws up to and including the last day for registration in the Fall and Winter Terms will not appear on the student's record. Courses from which the student withdraws after the last day of registration and up to the withdrawal deadline will appear with a grade of "W" (Withdrew with permission) on the transcript.

Deadlines for withdrawing from courses are listed in [Academic Schedule](#).

4. Prerequisites

Courses with prerequisites may only be used for degree credit if the prerequisite requirements are met. A grade of D is the minimum grade acceptable in a course which is to be used as a prerequisite.

Where a prerequisite is stated, it is understood that equivalent courses may be used to satisfy the requirement. In addition, the department offering a course with prerequisite requirements may waive the prerequisite in writing. (Prerequisite waiver forms are available from the Faculty of Science office and the Department offices).

1. Selection of Courses

Students are responsible for familiarizing themselves with program requirements and limitations as specified in the Calendar, for ensuring their programs are properly planned in accordance with degree specifications, and for the completeness and accuracy of their registration. Please read the Calendar carefully before registering in courses, and if you are in doubt about any regulations pertaining to your program, consult the Faculty of Science Office (1-001 CCIS) for clarification.

Students registered in the Faculty of Science must complete Science courses and Arts courses as specified by their program. Students may also take courses from other Faculties, but must adhere to the program-imposed limits for such Outside options.

Note: Anatomy courses are offered by the Faculty of Medicine **and Dentistry** and are considered Outside options.

2. Selection of First-Year Courses

Beginning first-year students who have completed no credits toward their programs normally restrict their registration to junior courses. First year students contemplating taking senior level courses should be careful to ensure that they have completed any prerequisites.

3. Withdrawal from Courses

Courses from which the student withdraws up to and including the last day for registration in the Fall and Winter Terms will not appear on the student's record. Courses from which the student withdraws after the last day of registration and up to the withdrawal deadline will appear with a grade of "W" (Withdrew with permission) on the transcript.

Deadlines for withdrawing from courses are listed in [Academic Schedule](#).

4. Prerequisites

Courses with prerequisites may only be used for degree credit if the prerequisite requirements are met. A grade of D is the minimum grade acceptable in a course which is to be used as a prerequisite.

Where a prerequisite is stated, it is understood that equivalent courses may be used to satisfy the requirement. In addition, the department offering a course with prerequisite requirements may waive the prerequisite in writing. (Prerequisite waiver forms are available from the Faculty of Science office and the Department offices).

Students who are unsure if they meet the prerequisite requirements in a course, or who wish to obtain permission to have a prerequisite waived, should consult the department offering the course.

5. Repeating Courses

No student will be permitted to repeat any University course, whether a failed course or a course having a grade of W, more than once except for reasons deemed sufficient by the Council of the Faculty in which the student is enrolled. For Science students, the Faculty will withhold credit or indicate the course is extra to degree on any course that contravenes this regulation.

Normally, a student will not be permitted to repeat a course in which a grade of D or more has been received.

Only two exceptions are permitted, and each requires written approval of the Dean or designee:

- a. When a higher grade is necessary for a course that is required in **one of the degree programs**
- b. When a student in Satisfactory Standing in the last year of a degree program repeats one course to raise the GPA to the level required by the degree program

A student who repeats a course in which a grade of D or more has been received, without written permission of the Faculty of Science, will have the grade attained on the initial passing of the course used for the purpose of meeting degree requirements, and no credit will be assigned to the repeated course.

Graduation

1. Application for Graduation

Students must be in satisfactory standing in their program (i.e., meet the continuation requirements in their final Fall/Winter) in order to graduate. Students who intend to receive a BSc (General, Specialization, or Honors) Degree must apply for the Degree on [Bear](#)

Students who are unsure if they meet the prerequisite requirements in a course, or who wish to obtain permission to have a prerequisite waived, should consult the department offering the course.

5. Repeating Courses

No student will be permitted to repeat any University course, whether a failed course or a course having a grade of W, more than once except for reasons deemed sufficient by the Council of the Faculty in which the student is enrolled. For Science students, the Faculty will withhold credit or indicate the course is extra to degree on any course that contravenes this regulation.

Normally, a student will not be permitted to repeat a course in which a grade of D or more has been received.

Only two exceptions are permitted, and each requires written approval of the Dean or designee:

- a. When a higher grade is necessary for a course that is required in **the student's current degree program.**
- b. When a student in Satisfactory Standing in the last year of a degree program repeats one course to raise the GPA to the level required by the degree program

A student who repeats a course in which a grade of D or more has been received, without written permission of the Faculty of Science, will have the grade attained on the initial passing of the course used for the purpose of meeting degree requirements, and no credit will be assigned to the repeated course.

6. Course Load Limits

Students are limited to 15 units in each of Fall and Winter terms and 6 units in each of Spring and Summer terms. When a student wishes to go beyond these limits, written approval is required from the Faculty of Science. Approval is contingent on having obtained a GPA of at least 3.0 on a course load of 30 units in the previous Fall/Winter at the University of Alberta.

Graduation

1. Application for Graduation

Students must be in satisfactory standing in their program (i.e., meet the continuation requirements in their final Fall/Winter) in order to graduate. Students who intend to receive a BSc (General, Specialization, or Honors) Degree must apply for the Degree on [Bear](#)

Tracks by February 1 for Spring Convocation or by September 1 for Fall Convocation. If degree requirements have been met and the student has not applied to graduate, the Faculty may apply on their behalf. All official transcripts from other postsecondary institutions are due by May 1 for Spring Convocation or by October 1 for Fall Convocation. Students who intend to apply for admission to an alternate degree program in the Faculty of Science for convocation purposes only must meet all of the admission, continuation, residency and graduation criteria for that BSc program.

2. **Degree Requirements**

All BSc Degrees require a minimum of 120 units of course weight. Courses with weights of 0 units are offered for credit only, and, although they may be required in specific degree programs, cannot be used to meet the minimum units of course weight requirement in any degree program.

3. **Convocation**

All requirements for graduation at Spring Convocation must be met by the end of Fall/Winter. Those completing degree requirements during Spring/Summer will graduate at the Fall Convocation.

4. **First-Class Honors**

First-Class Honors Degrees are awarded to any student in an Honors program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree. If determination of the **last 60 units of course weight** requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

5. **With Distinction**

Degrees With Distinction are awarded to any student in a General or Specialization program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree.

If determination of the last 60 units of course weight requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are

Tracks by February 1 for Spring Convocation or by September 1 for Fall Convocation. If degree requirements have been met and the student has not applied to graduate, the Faculty may apply on their behalf. All official transcripts from other postsecondary institutions are due by May 1 for Spring Convocation or by October 1 for Fall Convocation. Students who intend to apply for admission to an alternate degree program in the Faculty of Science for convocation purposes only must meet all of the admission, continuation, residency and graduation criteria for that BSc program.

2. **Degree Requirements**

All BSc Degrees require a minimum of 120 units of course weight. Courses with weights of 0 units are offered for credit only, and, although they may be required in specific degree programs, cannot be used to meet the minimum units of course weight requirement in any degree program.

3. **Convocation**

All requirements for graduation at Spring Convocation must be met by the end of Fall/Winter. Those completing degree requirements during Spring/Summer will graduate at the Fall Convocation.

4. **First-Class Honors**

First-Class Honors Degrees are awarded to any student in an Honors program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree. If determination of the **last 60 units of course weight** requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

5. **With Distinction**

Degrees With Distinction are awarded to any student in a General or Specialization program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree.

If determination of the last 60 units of course weight requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are

therefore given in Programs below. Regulations for Honors, Specialization, and General programs are found in Faculty of Science.

-
-
-

therefore given in Programs below. Regulations for Honors, Specialization, and General programs are found in Faculty of Science.

-
-
-

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 7, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

With these changes, we are harmonizing application and document deadlines. Having the letter of intent submitted later than the application is received causes problems when the applications are being processed.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11325>

Current						Proposed					
Faculty of Science Admission Deadlines						Faculty of Science Admission Deadlines					
	Admission		Readmission		Other Requirements		Admission		Readmission		Other Requirements
	Application	Documents	Application	Documents			Application	Documents	Application	Documents	
BSc General						BSc General, Specialization, Honors					
Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	For After Degree Students, letter of intent - June 15. Submit the letter of intent to Student Services, Faculty of Science.	Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	For After Degree Students, letter of intent - March 1.

Calendar Change Request Form for Program and Regulation Changes

		High School applicant - March 15 (See Note 1) August 1 (See Note 2)			
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				
Notes:					
1. All previously completed course work and course registration of current year.					
2. Final results of current year.					
BSc/BEd (Specialization in Science and Education)					
Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	
		High School applicant - March 15 (See Note 1) August 1 (See Note 2)			
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				
Notes:					
1. All previously completed course work and course registration of current year.					
2. Final results of current year.					
BSc (Specialization, Honors)					
Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	For the BSc Specialization in Planning, written statement - May 1 (see Admissions Chart 4)

		High School applicant - March 15 (See Note 1) August 1 (See Note 2)			
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				
Notes:					
1. All previously completed course work and course registration of current year.					
2. Final results of current year.					
BSc/BEd (Specialization in Science and Education)					
Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	
		High School applicant - March 15 (See Note 1) August 1 (See Note 2)			
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				
Notes:					
1. All previously completed course work and course registration of current year.					
2. Final results of current year.					

Calendar Change Request Form for Program and Regulation Changes

					For After Degree Students, letter of intent - June 15. Submit the letter of intent to Student Services, Faculty of Science
		High School applicant - March 15 (See Note 1) August 1 (See Note 2)			
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				
Notes:					
1. All previously completed course work and course registration of current year.					
2. Final results of current year.					
Special/Visiting					
Fall Term	July 1	July 1	July 1	July 1	For Special Students, letter of intent - June 15. Submit the letter of intent to Student Services, Faculty of Science.
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				

Special/Visiting					
Fall Term	July 1	July 1	July 1	July 1	For Special Students, letter of intent - July 1.
Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission				

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
 Faculty of Science: October 7, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty of Science Admission Requirements page is being updated to reflect the removal of course load requirements for all programs in the Faculty of Science.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): https://calendar.ualberta.ca/content.php?catoid=36&navoid=11306	
<p>Current</p> <p>Faculty of Science Admission Requirements</p> <ul style="list-style-type: none"> • BSc General Admission Requirements • BSc General—Minor in Business • BSc Honors and BSc Specialization Admission Requirements • BSc/BEd—Bachelor of Science (Specialization in Science and Education) and Bachelor of Education (Secondary) Combined Degrees • Postsecondary Transfer Students • Indigenous Applicants • Visiting Students • Special Students 	<p>Proposed</p> <p>Faculty of Science Admission Requirements</p> <ul style="list-style-type: none"> • BSc General Admission Requirements • BSc General—Minor in Business • BSc Honors and BSc Specialization Admission Requirements • BSc/BEd—Bachelor of Science (Specialization in Science and Education) and Bachelor of Education (Secondary) Combined Degrees • Postsecondary Transfer Students • Indigenous Applicants • Visiting Students • Special Students

Admission to the Faculty of Science is competitive. The number of high school and transfer admissions or readmissions to the Faculty is limited. Presentation of the minimum admission requirements and average does not guarantee admission. (See [Undergraduate Admission, Admission Decision Process](#)) Applicants will be assessed on the basis of their academic records as described below.

Grade 12 courses listed below are based on the Alberta Education curriculum.

Required Grade 12 Admission Subjects

1. English Language Arts 30-1.
2. Mathematics 30-1.
3. Two of Biology 30; Chemistry 30; Mathematics 31; Physics 30; Computing Science (CSE) Advanced Level-Career and Technology Studies (CTS).
4. Subject from Group A, B, or C

Note: Only 5-credit courses will be used for admission purposes.

Applicants to the BSc (Specialization in Science and Education) and BEd (Secondary) Combined Degree must present Biology 30 and Chemistry 30.

Note: Applicants should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see the [Bachelor of Science Course Pre-requisites webpage](#) for more information.

-
-
-

BSc Honors and BSc Specialization Admission Requirements

Consideration for the first year of an Honors program requires a minimum application average of 80%, or 75% for Specialization, on the required five admission subjects outlined in [Required Grade 12 Admission Subjects](#) above.

Students need not apply to Honors or Specialization in the first year and may instead apply to the BSc (General) program and take 18-30 units of course weight (in each Fall/Winter) with an appropriate selection of courses. Students may then apply in any subsequent year for transfer into an Honors or Specialization program by

Admission to the Faculty of Science is competitive. The number of high school and transfer admissions or readmissions to the Faculty is limited. Presentation of the minimum admission requirements and average does not guarantee admission. (See [Undergraduate Admission, Admission Decision Process](#)) Applicants will be assessed on the basis of their academic records as described below.

Grade 12 courses listed below are based on the Alberta Education curriculum.

Required Grade 12 Admission Subjects

5. English Language Arts 30-1.
6. Mathematics 30-1.
7. Two of Biology 30; Chemistry 30; Mathematics 31; Physics 30; Computing Science (CSE) Advanced Level-Career and Technology Studies (CTS).
8. Subject from Group A, B, or C

Note: Only 5-credit courses will be used for admission purposes.

Applicants to the BSc (Specialization in Science and Education) and BEd (Secondary) Combined Degree must present Biology 30 and Chemistry 30.

Note: Applicants should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see the [Bachelor of Science Course Pre-requisites webpage](#) for more information.

-
-
-

BSc Honors and BSc Specialization Admission Requirements

Consideration for the first year of an Honors program requires a minimum application average of 80%, or 75% for Specialization, on the required five admission subjects outlined in [Required Grade 12 Admission Subjects](#) above.

Transfer students must meet the minimum competitive AGPA as well as the requirements noted in [Admissions Chart 7: Science Specialization and Honors Requirements](#).

submitting an Application for Readmission and Internal Transfer to the Office of the Registrar by the application deadline. Admission beyond first year requires the minimum competitive GPA and course load in each of the preceding Fall/Winters (refer to Admissions Chart 7: Science Specialization and Honors Requirements for specific details for each program).

- -
 -
- -
 -

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 7, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Bachelor of Science Specialization program requirements page is being updated to reflect the removal of specific course load requirements for all programs in the Faculty of Science.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poid=42306&returnto=11345

Current	Proposed
<p>Bachelor of Science Specialization</p> <p>← Return to: Faculty of Science - Programs</p> <p>Four-year programs, comprising a minimum of 120 units, provide education to a professional level and lead to the degree of BSc with Specialization.</p> <p>Specialization programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Pharmacology, Physics, and Psychology.</p> <p>A five-year (150 units) BEd/BSc (Specialization in Science and Education) program with majors and minors in Biological, Mathematical, and Physical Sciences is also available (see</p>	<p>Bachelor of Science Specialization</p> <p>← Return to: Faculty of Science - Programs</p> <p>Four-year programs, comprising a minimum of 120 units, provide education to a professional level and lead to the degree of BSc with Specialization.</p> <p>Specialization programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Pharmacology, Physics, and Psychology.</p> <p>A five-year (150 units) BEd/BSc (Specialization in Science and Education) program with majors and minors in Biological, Mathematical, and Physical Sciences is also available (see</p>

[BSc Honors and BSc Specialization and BSc \(Specialization in Science and Education\)/BEd \(Secondary\) Combined Degrees Program \[Science\]](#).

Admission

See [BSc Honors and BSc Specialization Admission Requirements](#) for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Specialization programs:

1. In each year, a Specialization student's program must be approved by a Specialization advisor in the appropriate Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Specialization programs. Certain Departments may require more than 72 units. BSc Specialization in Planning requires a minimum of 66 units in Science.
3. A student must take at least 18 units in Arts courses as part of the requirements for most Specialization degrees.
4. Normally, no more than 42 units in junior courses are permitted in Specialization programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Specialization programs with the prior written approval of the Department directing the student's program.

Applicants to the BSc Specialization program who have taken non-Arts and non-Science courses before application will have the potential transfer credit for such courses assessed at the time of admission to the program.

Course Load Requirements

To graduate in four years normally requires that BSc Specialization students take the usual full course load of 30 units in each Fall/Winter of the program. Students who wish to extend their programs are still expected to complete at least 24 units in each Fall/Winter of the program. Exceptions to course load requirements must be approved in advance each year by the Department and the Faculty Office. (See [Time Limits for Completion of Program](#) below.)

[BSc Honors and BSc Specialization and BSc \(Specialization in Science and Education\)/BEd \(Secondary\) Combined Degrees Program \[Science\]](#).

Admission

See [BSc Honors and BSc Specialization Admission Requirements](#) for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Specialization programs:

1. In each year, a Specialization student's program must be approved by a Specialization advisor in the appropriate Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Specialization programs. Certain Departments may require more than 72 units. BSc Specialization in Planning requires a minimum of 66 units in Science.
3. A student must take at least 18 units in Arts courses as part of the requirements for most Specialization degrees.
4. Normally, no more than 42 units in junior courses are permitted in Specialization programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Specialization programs with the prior written approval of the Department directing the student's program.

Applicants to the BSc Specialization program who have taken non-Arts and non-Science courses before application will have the potential transfer credit for such courses assessed at the time of admission to the program.

Course Load Requirements

The BSc Specialization degree is designed to be a four-year program. To graduate in four years, students should take a full course load of 30 units in each Fall/Winter of the program. Students may meet degree requirements in a shorter time by attending Spring/Summer. Students may extend their program beyond four years by taking a reduced course load.

Academic Standing and Graduation

The following regulations govern Specialization programs:

1. Continuation in a Specialization program is by recommendation of the Department concerned and requires a GPA of at least 2.3 in each of the preceding Fall/Winter periods. See description of Specialization programs of individual departments for additional requirements relating to promotion in the Specialization program. Students must be in good standing (i.e., meet the continuation requirements) in the Specialization program in order to graduate.
2. A student who fails to attain the standard necessary for continuation in the Specialization program will be required to withdraw from that program. In so doing, the student may apply to transfer to the General program in the Faculty. Students applying to transfer from a Specialization to the General program must meet the continuation GPA of 2.0.
3. A student who fails to complete the requirements for a Specialization degree in the fourth year may be granted the General degree forthwith on application if the courses taken and the standing attained are satisfactory. Such students must apply to transfer to the General program.
4. For graduation, a program of at least 120 units credited to the degree.
5. BSc Specialization degrees With Distinction are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

Time Limits for Completion of Program

All BSc Specialization programs are designed to be four year

Academic Standing and Graduation

The following regulations govern Specialization programs:

1. Continuation in a Specialization program is by recommendation of the Department concerned and requires a GPA of at least 2.3 in each of the preceding Fall/Winter periods. See description of Specialization programs of individual departments for additional requirements relating to promotion in the Specialization program. Students must be in good standing (i.e., meet the continuation requirements) in the Specialization program in order to graduate.
2. A student who fails to attain the standard necessary for continuation in the Specialization program will be required to withdraw from that program. In so doing, the student may apply to transfer to the General program in the Faculty. Students applying to transfer from a Specialization to the General program must meet the continuation GPA of 2.0.
3. A student who fails to complete the requirements for a Specialization degree in the last year may be granted the General degree forthwith on application if the courses taken and the standing attained are satisfactory. Such students must apply to transfer to the General program.
4. For graduation, a program of at least 120 units credited to the degree.
5. BSc Specialization degrees With Distinction are awarded when students obtain a GPA of at least 3.5 and no failing grades on the last 60 units, excluding courses declared extra-to-degree. If determination of the last 60 units requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of the program.

Residence Requirement

A student transferring to the Faculty of Science with advanced standing must complete at least 60 units applicable to the BSc program while registered at the University of Alberta. Normally, at least 30 of the last 60 units must be completed while registered in the Faculty of Science.

programs. However, in some cases the minimum course load requirements have been reduced to allow students the flexibility to complete the degree over a longer time period. Students wishing to extend their programs beyond the time frame dictated by the minimum course load requirement for their program must first obtain the written approval of the Department and the Associate Dean, Undergraduate or designate.

BSc Specialization Requirements

- [Specialization in Biochemistry](#)

Specialization in Biochemistry [Science]

Continuation in the Specialization in Biochemistry program requires ~~successful completion of at least 24 units with~~ a minimum GPA of 2.7 in the previous Fall/Winter. In addition, graduation from the program requires a minimum GPA of 2.7 on the last 60 units credited towards the degree.

-
-
-

- [Specialization in Biological Sciences](#)

Specialization in Biological Sciences [Science]

All students in Honors and Specialization programs in Biological Science take a common core of four BIOL courses in the first and second years. Thereafter, they follow the course sequence of one of the areas of concentration in either Honors or Specialization in Biological Sciences identified in [Science Chart 2 Course Sequence in Biological Sciences](#). Students must declare an area of concentration and follow the appropriate course sequence. The title of the area of concentration will appear on their degree. Additional course requirements for Honors students include [BIOL 499](#) and program specific courses. [BIOL 499](#), a directed research project, must be conducted on a topic appropriate to the student's area of concentration. [BIOL 499](#) is a recommended option for Specialization students.

Streams have been developed in Biological

BSc Specialization Requirements

- [Specialization in Biochemistry](#)

Specialization in Biochemistry [Science]

Continuation in the Specialization in Biochemistry program requires a minimum GPA of 2.7 in the previous Fall/Winter. In addition, graduation from the program requires a minimum GPA of 2.7 on the last 60 units credited towards the degree.

-
-
-

- [Specialization in Biological Sciences](#)

Specialization in Biological Sciences [Science]

All students in Honors and Specialization programs in Biological Science take a common core of four BIOL courses in the first and second years. Thereafter, they follow the course sequence of one of the areas of concentration in either Honors or Specialization in Biological Sciences identified in [Course Sequence in Biological Sciences](#). Students must declare an area of concentration and follow the appropriate course sequence. The title of the area of concentration will appear on their degree. Additional course requirements for Honors students include [BIOL 499](#) and program specific courses. [BIOL 499](#), a directed research project, must be conducted on a topic appropriate to the student's area of concentration. [BIOL 499](#) is a recommended option for Specialization students.

Streams have been developed in Biological

Sciences. These are lists of courses that provide guidance to students wishing to focus further on specific areas of Biology. Students in a program are not required to declare or follow a stream, and stream designations do not appear on transcripts. Streams are described in full on the Department of Biological Sciences website. Students should consult with advisors in choosing and following streams within their programs.

Students may receive block Transfer in the Biological Sciences at the University of Calgary or the University of Lethbridge if the appropriate courses are completed. Interested students may contact the Department of Biological Sciences for details.

Specialization in Biological Sciences

Admission to the BSc Specialization in Biological Sciences program see [Admissions Chart 7: Science Specialization and Honors Requirements](#), Faculty of Science.

Continuation in the Specialization in Biological Sciences program requires **successful completion of at least 24 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

-
-
-

~~Science Chart 2~~ Course Sequence in Biological Sciences

- [Ecology, Evolution and Environmental Biology](#)
- [Integrative Physiology](#)
- [Molecular, Cellular and Developmental Biology](#)

Suspended Areas of Concentration

Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in:

- Animal Biology
- Evolutionary Biology
- Microbiology

Sciences. These are lists of courses that provide guidance to students wishing to focus further on specific areas of Biology. Students in a program are not required to declare or follow a stream, and stream designations do not appear on transcripts. Streams are described in full on the Department of Biological Sciences website. Students should consult with advisors in choosing and following streams within their programs.

Students may receive block Transfer in the Biological Sciences at the University of Calgary or the University of Lethbridge if the appropriate courses are completed. Interested students may contact the Department of Biological Sciences for details.

Specialization in Biological Sciences

Admission to the BSc Specialization in Biological Sciences program see [Admissions Chart 7: Science Specialization and Honors Requirements](#), Faculty of Science.

Continuation in the Specialization in Biological Sciences program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

-
-
-

Course Sequence in Biological Sciences

- [Ecology, Evolution and Environmental Biology](#)
- [Integrative Physiology](#)
- [Molecular, Cellular and Developmental Biology](#)

Suspended Areas of Concentration

Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in:

- Animal Biology
- Evolutionary Biology
- Microbiology

- Plant Biology

Students who entered one of these programs prior to September 2017 must complete all program requirements by April 30, 2024. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in these concentrations will be granted at Spring Convocation 2024.

Science Internship Program

A Science Internship Program, is offered to students in the General, Specialization or Honors programs in Biological Sciences (see [Science Internship Program](#) for guidelines to the program).

- [Specialization in Ecology, Evolution and Environmental Biology](#)

-
-
-

- [Specialization in Integrative Physiology](#)

-
-
-

- [Specialization in Molecular, Cellular and Developmental Biology](#)

-
-
-

- [Specialization in Cell Biology](#)

Specialization in Cell Biology [Science]

Continuation in the Specialization in Cell Biology program requires [successful completion of at least 24 units with](#) a minimum 2.3 GPA in each preceding Fall/Winter.

- Plant Biology

Students who entered one of these programs prior to September 2017 must complete all program requirements by April 30, 2024. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in these concentrations will be granted at Spring Convocation 2024.

- [Specialization in Ecology, Evolution and Environmental Biology](#)

-
-
-

- [Specialization in Integrative Physiology](#)

-
-
-

- [Specialization in Molecular, Cellular and Developmental Biology](#)

-
-
-

- [Specialization in Cell Biology](#)

Specialization in Cell Biology [Science]

Continuation in the Specialization in Cell Biology program requires a minimum 2.3 GPA in each preceding Fall/Winter.

<ul style="list-style-type: none"> • • • • Specialization in Chemistry <p>Specialization in Chemistry [Science]</p> <hr/> <p>Continuation in the Specialization in Chemistry program requires successful completion of at least 18 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.</p> <p>The Specialization Chemistry degree is accredited by the Canadian Society for Chemistry.</p> <ul style="list-style-type: none"> • • • • Specialization in Computing Science <p>Specialization in Computing Science [Science]</p> <hr/> <p>For admission requirements, see Faculty of Science. There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.</p> <p>Specialization in Computing Science</p> <hr/> <p>The Specialization in Computing Science program is designed for students to pursue the concentrated study of Computing Science, or to combine the study of Computing Science with another discipline. Students should consider the Science Internship Program.</p> <p>Continuation in the Specialization in Computing Science program requires successful completion of at least 18 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all CMPUT courses completed</p>	<ul style="list-style-type: none"> • • • • Specialization in Chemistry <p>Specialization in Chemistry [Science]</p> <hr/> <p>Continuation in the Specialization in Chemistry program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all CHEM courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.</p> <p>The Specialization Chemistry degree is accredited by the Canadian Society for Chemistry.</p> <ul style="list-style-type: none"> • • • • Specialization in Computing Science <p>Specialization in Computing Science [Science]</p> <hr/> <p>For admission requirements, see Faculty of Science. There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.</p> <p>Specialization in Computing Science</p> <hr/> <p>The Specialization in Computing Science program is designed for students to pursue the concentrated study of Computing Science, or to combine the study of Computing Science with another discipline. Students should consider the Science Internship Program.</p> <p>Continuation in the Specialization in Computing Science program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all CMPUT courses completed in the previous Fall/Winter. In addition, graduation</p>
--	---

in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units and a minimum 2.3 GPA on all CMPUT courses credited towards the degree.

Specialization students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta. Students can take a maximum of 42 units in 100-level courses.

Course selections in other departments and Faculties may be subject to enrolment management and GPA requirements.

-
-
-

- [Specialization in Computing Science—Minor in Business](#)

Specialization in Computing Science—Minor in Business [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Specialization in Computing Science—Minor in Business

The minor in Business program is for students interested in a career that combines Computing Science and Business. Students in the program have access to a limited number of reserved places in Business courses. Business minor students should consider the Science Internship Program.

Continuation in the Specialization in Computing Science - Minor in Business program requires **successful completion of at least 18 units with a minimum 2.3 GPA** and a minimum 2.3 GPA on all CMPUT and Business courses completed in the previous Fall/Winter. In addition, graduation requires

requires a minimum 2.3 GPA on the last 60 units and a minimum 2.3 GPA on all CMPUT courses credited towards the degree.

Specialization students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta. Students can take a maximum of 42 units in 100-level courses.

Course selections in other departments and Faculties may be subject to enrolment management and GPA requirements.

-
-
-

- [Specialization in Computing Science—Minor in Business](#)

Specialization in Computing Science—Minor in Business [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Specialization in Computing Science—Minor in Business

The minor in Business program is for students interested in a career that combines Computing Science and Business. Students in the program have access to a limited number of reserved places in Business courses. Business minor students should consider the Science Internship Program.

Continuation in the Specialization in Computing Science - Minor in Business program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all CMPUT and Business courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units and a

a minimum 2.3 GPA on the last 60 units and a minimum 2.3 GPA on all CMPUT and Business courses credited towards the degree. (Note that ECON courses are not counted as Business courses.)

Specialization with Business minor students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta.

Students can take a maximum of 42 units in 100-level courses.

Course selections in other departments and Faculties may be subject to enrolment management policies and GPA requirements.

Students who choose not to continue in the Specialization Computing Science program lose their status as "pursuing a Business Minor". Upon reapplication, students may be able to pursue the Business minor in the General Program if they meet the competitive admission GPA for this minor.

-
-
-

- [Computing Science Specialization in Software Practice](#)

Computing Science Specialization in Software Practice [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Computing Science Specialization in Software Practice

The Software Practice program is for students interested in a career as a software professional. It

minimum 2.3 GPA on all CMPUT and Business courses credited towards the degree. (Note that ECON courses are not counted as Business courses.)

Specialization with Business minor students must complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta.

Students can take a maximum of 42 units in 100-level courses.

Course selections in other departments and Faculties may be subject to enrolment management policies and GPA requirements.

Students who choose not to continue in the Specialization Computing Science program lose their status as "pursuing a Business Minor". Upon reapplication, students may be able to pursue the Business minor in the General Program if they meet the competitive admission GPA for this minor.

-
-
-

- [Computing Science Specialization in Software Practice](#)

Computing Science Specialization in Software Practice [Science]

For admission requirements, see [Faculty of Science Admission Requirements](#).

There are many routes to the study of Computing Science. Students should visit our website at www.cs.ualberta.ca. Each student is expected to develop their program of study in consultation with an advisor. All Honors and Specialization programs require annual approval by the department.

Computing Science Specialization in Software Practice

The Software Practice program is for students

BSc Specialization in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta)

In addition to the requirements set out in [After Degrees](#), a student pursuing this designation must also complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta as part of their 60 units.

- [Specialization in Atmospheric Sciences](#)

Specialization in Atmospheric Sciences [Science]

Specialization in Atmospheric Sciences

Effective September 2019, there will be no further admissions into BSc Honors or BSc Specialization in Atmospheric Sciences. Students who entered one of these programs prior to September 2019 must complete all program requirements by April 2026. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in Atmospheric Sciences will be granted Spring Convocation 2026.

-
-
-

- [Specialization in Environmental Earth Sciences](#)

Specialization in Environmental Earth Sciences [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in**

require annual approval by the department.

BSc Specialization in Computing Science After an Undergraduate Degree (other than a BSc from the Faculty of Science at the University of Alberta)

In addition to the requirements set out in [After Degrees](#), a student pursuing this designation must also complete a minimum of 24 units in CMPUT courses at the 300- or 400-level offered at the University of Alberta as part of their 60 units.

- [Specialization in Atmospheric Sciences](#)

Specialization in Atmospheric Sciences [Science]

Specialization in Atmospheric Sciences

Effective September 2019, there will be no further admissions into BSc Honors or BSc Specialization in Atmospheric Sciences. Students who entered one of these programs prior to September 2019 must complete all program requirements by April 2026. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. The last BSc Honors or BSc Specialization in Atmospheric Sciences will be granted Spring Convocation 2026.

-
-
-

- [Specialization in Environmental Earth Sciences](#)

Specialization in Environmental Earth Sciences [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and**

Planning, see Faculty of Arts listing.

Specialization in Environmental Earth Sciences

Continuation in the Specialization in Environmental Earth Sciences program requires **successful completion of at least 18 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree.

A student enrolling in the Specialization program should confer with the Environmental Earth Sciences Program student advisor before registration.

-
-
-

- [Specialization in Geology](#)

Specialization in Geology [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Specialization in Geology

Continuation in the Specialization in Geology program requires **successful completion of at least 18 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree.

A student enrolling in the Specialization program should consult the Geology program student advisor before registration each year.

-

Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.

Specialization in Environmental Earth Sciences

Continuation in the Specialization in Environmental Earth Sciences program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree.

A student enrolling in the Specialization program should confer with the Environmental Earth Sciences Program student advisor before registration.

-
-
-

- [Specialization in Geology](#)

Specialization in Geology [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Specialization in Geology

Continuation in the Specialization in Geology program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree.

A student enrolling in the Specialization program should consult the Geology program student advisor before registration each year.

-
-

- [Specialization in Planning](#)

Specialization in Planning [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Specialization in Planning

The School of Urban and Regional Planning educates students in the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of communities. Planners work for all levels of government and in professional planning consultancies The School of Urban and Regional Planning in the Department of Earth and Atmospheric Sciences offers a BA major in Planning and a BSc Specialization in Planning. Students interested in focusing on natural science elements of planning, including environmental management and the use of geographic information sciences, should consider the BSc program and those interested in the aesthetic, economic, and social issues of planning should consider the BA program (see [Planning](#) of the Calendar).

Continuation in the Specialization in Planning program requires a minimum 2.3 GPA **on at least 18 units** in the previous Fall/Winter. To graduate in four years, a student needs 30 units per year.

Graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree. A student enrolling in the Specialization program should confer with the Planning program student advisor before registration.

-
-
-

- [Specialization in Planning](#)

Specialization in Planning [Science]

Earth and Atmospheric Sciences encompass the study of the atmosphere, surface and interior of the earth. The Department administers 10 academic programs: Honors and Specialization in Environmental Earth Sciences, Honors and Specialization in Geology, Honors and Specialization in Paleontology, BSc Specialization in Planning, BA Major and Minor in Human Geography, and BA Major in Planning. **For details on the Major and Minor in Human Geography and on the BA Major in Planning, see Faculty of Arts listing.**

Specialization in Planning

The School of Urban and Regional Planning educates students in the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of communities. Planners work for all levels of government and in professional planning consultancies The School of Urban and Regional Planning in the Department of Earth and Atmospheric Sciences offers a BA major in Planning and a BSc Specialization in Planning. Students interested in focusing on natural science elements of planning, including environmental management and the use of geographic information sciences, should consider the BSc program and those interested in the aesthetic, economic, and social issues of planning should consider the BA program (see [Planning](#) of the Calendar).

Continuation in the Specialization in Planning program requires a minimum 2.3 GPA in the previous Fall/Winter. To graduate in four years, a student needs 30 units per year.

Graduation requires a minimum 2.3 GPA on the last 60 units credited to the degree. A student enrolling in the Specialization program should confer with the Planning program student advisor before

Special Note: Prior to the 2020/21 Calendar, the Course Designation of HGP was used for HGEO and PLAN courses. HGP courses can be used in place of HGEO or PLAN courses provided they have the same course numbers, for example HGP 399 can be used in place of either HGEO 399 or PLAN 399. Similarly, HGEO or PLAN courses of the same number can be used in place of HGP courses for those following earlier versions of the Calendar.

-
-
-

- [Specialization in Immunology and Infection](#)

Specialization in Immunology and Infection [Science]

Continuation in the Specialization in Immunology and Infection program requires **successful completion of at least 24 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

-
-
-

- [Specialization in Mathematics](#)

Specialization in Mathematics [Science]

Continuation in the Specialization in Mathematics program requires **successful completion of at least 24 units with** a minimum 2.3 GPA and a minimum 2.3 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

-

registration.

Special Note: Prior to the 2020/21 Calendar, the Course Designation of HGP was used for HGEO and PLAN courses. HGP courses can be used in place of HGEO or PLAN courses provided they have the same course numbers, for example HGP 399 can be used in place of either HGEO 399 or PLAN 399. Similarly, HGEO or PLAN courses of the same number can be used in place of HGP courses for those following earlier versions of the Calendar.

-
-
-

- [Specialization in Immunology and Infection](#)

Specialization in Immunology and Infection [Science]

Continuation in the Specialization in Immunology and Infection program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

-
-
-

- [Specialization in Mathematics](#)

Specialization in Mathematics [Science]

Continuation in the Specialization in Mathematics program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all MATH courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all MATH courses credited towards the degree.

The program must contain the following courses. It is recommended that these courses be taken in the years indicated.

-

<ul style="list-style-type: none"> • • • <u>Specialization in Mathematics - Computational Science</u> <p style="text-align: center;">Specialization in Mathematics - Computational Science [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics - Computational Science program requires successful completion of at least 24 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all CMPUT, MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all CMPUT, MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • • • <ul style="list-style-type: none"> • <u>Specialization in Mathematics and Economics</u> <p style="text-align: center;">Specialization in Mathematics and Economics [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics and Economics program requires successful completion of at least 24 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all ECON, MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all ECON, MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • • • <u>Specialization in Mathematics - Computational Science</u> <p style="text-align: center;">Specialization in Mathematics - Computational Science [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics - Computational Science program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all CMPUT, MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all CMPUT, MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • • • <ul style="list-style-type: none"> • <u>Specialization in Mathematics and Economics</u> <p style="text-align: center;">Specialization in Mathematics and Economics [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics and Economics program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all ECON, MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all ECON, MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> •
---	---

<ul style="list-style-type: none"> • • • • Specialization in Mathematics and Finance <p style="text-align: center;">Specialization in Mathematics and Finance [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics and Finance program requires successful completion of at least 24 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all ACCTG, ECON, FIN, MATH, MGTSC, OM and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all ACCTG, ECON, FIN, MATH, MGTSC, OM and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • • • • Specialization in Statistics <p style="text-align: center;">Specialization in Statistics [Science]</p> <hr/> <p>Continuation in the Specialization in Statistics program requires successful completion of at least 24 units with a minimum 2.3 GPA and a minimum 2.3 GPA on all MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> • • • • Specialization in Mathematics and Finance <p style="text-align: center;">Specialization in Mathematics and Finance [Science]</p> <hr/> <p>Continuation in the Specialization in Mathematics and Finance program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all ACCTG, ECON, FIN, MATH, MGTSC, OM and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all ACCTG, ECON, FIN, MATH, MGTSC, OM and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • • • • Specialization in Statistics <p style="text-align: center;">Specialization in Statistics [Science]</p> <hr/> <p>Continuation in the Specialization in Statistics program requires a minimum 2.3 GPA and a minimum 2.3 GPA on all MATH and STAT courses completed in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited towards the degree and a minimum 2.3 GPA on all MATH and STAT courses credited towards the degree.</p> <p>The program must contain the following courses. It is recommended that these courses be taken in the years indicated.</p> <ul style="list-style-type: none"> • •
---	---

- [Specialization in Paleontology](#)

Specialization in Paleontology [Science]

Paleontology is a basic science concerned with the evolutionary history of life. Students are required to have a broad knowledge base of biological and geological knowledge. Areas of detailed knowledge will include vertebrate and invertebrate paleobiology, paleobotany, evolutionary biology, systematics, functional morphology, sedimentology, stratigraphy, and plate tectonics. Paleontologists usually hold advanced research degrees and work as research scientists and teachers in universities, museums, and industrial laboratories.

Specialization in Paleontology

Continuation in the Specialization in Paleontology program requires **successful completion of at least 18 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

- [Specialization in Pharmacology](#)

Specialization in Pharmacology [Science]

The program leading to a Specialization degree in Pharmacology is for students who want to pursue further studies in the health sciences and those who want to prepare for a career in the Pharmaceutical industry. Although not as rigorous as an Honors program, the Specialization program is a solid background for advanced study leading to a career in academia or research.

Continuation and graduation in the Specialization in Pharmacology program requires **successful completion of at least 24 units with** a minimum 2.7 GPA, a minimum 2.7 GPA on all Science courses

- [Specialization in Paleontology](#)

Specialization in Paleontology [Science]

Paleontology is a basic science concerned with the evolutionary history of life. Students are required to have a broad knowledge base of biological and geological knowledge. Areas of detailed knowledge will include vertebrate and invertebrate paleobiology, paleobotany, evolutionary biology, systematics, functional morphology, sedimentology, stratigraphy, and plate tectonics. Paleontologists usually hold advanced research degrees and work as research scientists and teachers in universities, museums, and industrial laboratories.

Specialization in Paleontology

Continuation in the Specialization in Paleontology program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on all courses credited to the degree.

- [Specialization in Pharmacology](#)

Specialization in Pharmacology [Science]

The program leading to a Specialization degree in Pharmacology is for students who want to pursue further studies in the health sciences and those who want to prepare for a career in the Pharmaceutical industry. Although not as rigorous as an Honors program, the Specialization program is a solid background for advanced study leading to a career in academia or research.

Continuation and graduation in the Specialization in Pharmacology program requires a minimum 2.7 GPA, a minimum 2.7 GPA on all Science courses taken and a minimum 2.7 GPA on all PMCOL

taken and a minimum 2.7 GPA on all PMCOL courses taken in each previous Fall/Winter.

-
-
-

- [Specialization in Physics](#)

Specialization in Physics [Science]

Continuation in the Specialization in Physics program requires **successful completion of at least 24 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.

-
-
-

- [Specialization in Astrophysics](#)

Specialization in Astrophysics [Science]

Continuation in the Specialization in Astrophysics program requires **successful completion of at least 24 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.

-
-
-

- [Specialization in Geophysics](#)

Specialization in Geophysics [Science]

Continuation in the Specialization in Geophysics program requires **successful completion of at least 24 units with** a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a

courses taken in each previous Fall/Winter.

-
-
-

- [Specialization in Physics](#)

Specialization in Physics [Science]

Continuation in the Specialization in Physics program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.

-
-
-

- [Specialization in Astrophysics](#)

Specialization in Astrophysics [Science]

Continuation in the Specialization in Astrophysics program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.

-
-
-

- [Specialization in Geophysics](#)

Specialization in Geophysics [Science]

Continuation in the Specialization in Geophysics program requires a minimum 2.3 GPA in the previous Fall/Winter. In addition, graduation requires a minimum 2.3 GPA on the last 90 units credited to the degree.

<p>minimum 2.3 GPA on the last 90 units credited to the degree.</p> <ul style="list-style-type: none"> • • • • • Specialization in Psychology <p>Specialization in Psychology [Science]</p> <hr/> <p>Continuation in the Specialization in Psychology program requires the successful completion of 24 units with a minimum GPA of 2.3 in the preceding Fall/Winter. Graduation requires a minimum GPA of 2.3 on all courses credited to the degree.</p> <ul style="list-style-type: none"> • • • <p>← Return to: Faculty of Science - Programs</p>	<ul style="list-style-type: none"> • • • • Specialization in Psychology <p>Specialization in Psychology [Science]</p> <hr/> <p>Continuation in the Specialization in Psychology program requires a minimum GPA of 2.3 in the preceding Fall/Winter. Graduation requires a minimum GPA of 2.3 on all courses credited to the degree.</p> <ul style="list-style-type: none"> • • • <p>← Return to: Faculty of Science - Programs</p>
---	--

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs. Faculty Approval: October 7, 2022</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Admissions Chart 7: Science Specialization and Honors Requirements is being updated to reflect the removal of the course load requirements for all Specialization and Honors programs in the Faculty of Science.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11292>

Current

Admissions Chart 7: Science Specialization and Honors Requirements

Note: Students should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see www.uofa.ualberta.ca/science/programs/undergraduate/admission-to-science for more information.

Program	Honors Required Average	Specialization Required Average	Admission Requirements
Applied Mathematics	High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken	No Specialization program offered.	

Proposed

Admissions Chart 7: Science Specialization and Honors Requirements

Postsecondary Transfer Students must meet the minimum competitive AGPA and the specific requirements for each program as outlined below.

Note: Students should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see www.uofa.ualberta.ca/science/programs/undergraduate/admission-to-science for more information.

Program	Honors Required Average	Specialization Required Average	Admission Requirements
Applied Mathematics	High School - minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken	No Specialization program offered.	

Calendar Change Request Form for Program and Regulation Changes

	which are eligible to be credited to the degree and a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors) .				which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors) .		
Applied Mathematics - Minor in Computing Science	High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter.	No Specialization program offered.		Applied Mathematics - Minor in Computing Science	High School - minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Applied Mathematics - Minor in Statistics	High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter.	No Specialization program offered.		Applied Mathematics - Minor in Statistics	High School - minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Astrophysics	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors) .	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization) .		Astrophysics	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors) .	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization) .	
Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Honors in Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Specialization in Atmospheric Sciences		Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Honors in Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Specialization in Atmospheric Sciences	
Biochemistry	High School -	High School -		Biochemistry	High School -	High School -	

Calendar Change Request Form for Program and Regulation Changes

	minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	minimum 75% Transfer - a minimum 2.7 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)			minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	minimum 75% Transfer - a minimum 2.7 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Biological Sciences Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics. Note: Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in Animal Biology, Evolutionary Biology, Microbiology and Plant Biology	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Biological Sciences Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics. Note: Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in Animal Biology, Evolutionary Biology, Microbiology and Plant Biology	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Cell Biology	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Cell Biology	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Chemistry	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission	High School - minimum 75% Transfer - a minimum 2.3 GPA on all Chemistry courses and a minimum 2.3 GPA on 18 units of course weight in		Chemistry	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on all Chemistry courses and a minimum 2.3 GPA in each preceding Fall/Winter.	

Calendar Change Request Form for Program and Regulation Changes

	requirements, see BSc (Honors)	each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)				For admission requirements, see Bachelor of Science (Specialization)	
Computing Science	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter and a minimum 3.0 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 18 units of course weight in each preceding Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see Bachelor of Science (Specialization)		Computing Science	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter and a minimum 3.0 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see Bachelor of Science (Specialization)	
Computing Science - Business Minor	No Honors program offered.	High School - no Year 1 entry Transfer - Admission will be competitive and will require a minimum GPA of 2.3 on 18 units of course weight in each preceding Fall/Winter, a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer, and completion of CMPUT 174 , CMPUT 175 , MATH 114 , MATH 115 , 6 units in junior English, 6 units in Science, 6 units in an approved option, which may include CMPUT 272 . For admission requirements, see Bachelor of Science (Specialization)		Computing Science - Business Minor	No Honors program offered.	High School - no Year 1 entry Transfer - Admission will be competitive and will require a minimum 2.3 GPA in each preceding Fall/Winter, a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer, and completion of CMPUT 174 , CMPUT 175 , MATH 114 , MATH 115 , 6 units in junior English, 6 units in Science, 6 units in an approved option, which may include CMPUT 272 . For admission requirements, see Bachelor of Science (Specialization)	
Computing Science Specialization in Software Practice	No Honors program offered.	High School - minimum 75% Transfer - a minimum 2.3 GPA on 18 units of		Computing Science Specialization in Software Practice	No Honors program offered.	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding	

Calendar Change Request Form for Program and Regulation Changes

		course weight in each preceding Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see Bachelor of Science (Specialization) .				Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see Bachelor of Science (Specialization) .	
Computing Science Specialization Stream in Bioinformatics Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics.				Computing Science Specialization Stream in Bioinformatics Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics.			
Environmental Earth Sciences	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum 2.3 GPA on 18 units of course weight in each preceding Fall/Winter and completion of the course requirements outlined at right.	Course requirements: Of the required first year courses for the program, successful completion of at least: EAS 100 and EAS 105 CHEM 101 MATH 113 or MATH 114 PHYS 124 or PHYS 144	Environmental Earth Sciences	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Course requirements: Of the required first year courses for the program, successful completion of at least: EAS 100 and EAS 105 CHEM 101 MATH 113 or MATH 114 PHYS 124 or PHYS 144
Geology	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter and completion of the	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum cumulative average 2.3 GPA over all courses completed and completion of the	Course requirements: Of the required first year courses for the program, successful completion of at least: EAS 100 and EAS 105 CHEM 101 MATH 113 or MATH 114 PHYS 124 or	Geology	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum cumulative average 2.3 GPA over all courses completed and completion of the	Course requirements: Of the required first year courses for the program, successful completion of at least: EAS 100 and EAS 105 CHEM 101 MATH 113 or MATH 114 PHYS 124 or

Calendar Change Request Form for Program and Regulation Changes

	course requirements outlined at right.	course requirements outlined at right.	PHYS 144		outlined at right.	course requirements outlined at right.	PHYS 144
Geophysics (Department of Physics)	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Geophysics (Department of Physics)	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Immunology and Infection	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter.		Immunology and Infection	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter.	
Mathematical Physics (Department of Physics)	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	No Specialization program offered.		Mathematical Physics (Department of Physics)	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	No Specialization program offered.	
Mathematics	High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible to be credited to the degree and a minimum GPA of 3.0 on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - requires a GPA of at least 2.3 on all Mathematics courses taken which are eligible to be credited to the degree and successful completion of at least 24 units of course weight with a GPA of at least 2.3 in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Mathematics	High School - minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Mathematics -	High School -	No Specialization		Mathematics -	High School -	No Specialization	

Calendar Change Request Form for Program and Regulation Changes

<p>Minor in Computing Science</p>	<p>minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible to be credited to the degree and a minimum GPA of 3.0 on 24 units of course weight in each preceding Fall/Winter.</p>	<p>program offered.</p>		<p>Minor in Computing Science</p>	<p>minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.</p>	<p>program offered.</p>	
<p>Mathematics - Minor in Statistics</p>	<p>High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible to be credited to the degree and a minimum GPA of 3.0 on 24 units of course weight in each preceding Fall/Winter.</p>	<p>No Specialization program offered.</p>		<p>Mathematics - Minor in Statistics</p>	<p>High School - minimum 80% Transfer - a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.</p>	<p>No Specialization program offered.</p>	
<p>Mathematics - Computational Science (Department of Mathematical and Statistical Sciences)</p>	<p>No Honors program offered.</p>	<p>High School - minimum 75% Transfer - requires a GPA of at least 2.3 on the aggregate of all Mathematics, Statistics and Computing Science courses taken which are eligible to be credited to the degree and successful completion of at least 24 units of course weight with a GPA of at least 2.3 in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization).</p>		<p>Mathematics - Computational Science (Department of Mathematical and Statistical Sciences)</p>	<p>No Honors program offered.</p>	<p>High School - minimum 75% Transfer - a minimum 2.3 GPA on the aggregate of all Mathematics, Statistics and Computing Science courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization).</p>	
<p>Mathematics and Economics</p>	<p>High School - minimum 80% Transfer - requires a GPA of at least 3.0 on all Mathematics courses taken which are eligible</p>	<p>High School - minimum 75% Transfer - normally requires a GPA of at least 2.3 on the aggregate of all Mathematics,</p>		<p>Mathematics and Economics</p>	<p>High School - minimum 80% Transfer - a minimum 3.0 GPA on the aggregate of all Mathematics, Economics, and</p>	<p>High School - minimum 75% Transfer - a minimum 2.3 GPA on the aggregate of all Mathematics, Economics, and</p>	

Calendar Change Request Form for Program and Regulation Changes

	to be credited to the degree and a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	Economics, and Statistics courses taken which are eligible to be credited to the degree, and, in the student's most recent Fall/Winter, successful completion of at least 24 units of course weight with a GPA of at least 2.3 in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)			Statistics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	Statistics courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Mathematics and Finance	<p>High School - No Year 1 entry Transfer - Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>For Year 2 entry - Students must have completed:</p> <ol style="list-style-type: none"> at least 24 units of course weight in the preceding Fall/Winter with a GPA of at least 3.0, and Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a GPA of at least 3.0. <p>For Year 3 Entry - Students must have completed:</p> <ol style="list-style-type: none"> at least 24 units of course weight in each preceding Fall/ Winter with a GPA of at least 3.0, and 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a GPA of at least 3.0. 	<p>High School - No Year 1 entry Transfer - Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>For Year 2 entry - Students must have completed:</p> <ol style="list-style-type: none"> at least 24 units of course weight in the preceding Fall/Winter with a GPA of at least 2.7, and Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a GPA of at least 2.7. <p>For Year 3 Entry - Students must have completed:</p> <ol style="list-style-type: none"> at least 24 units of course weight in each preceding Fall/ Winter with a GPA of at least 2.7, and 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a GPA of at least 2.7. 	<p>Specialization Mathematics and Finance</p> <p>Course requirements for Year 2 entry:</p> <ol style="list-style-type: none"> MATH 154, MATH 156 MATH 125 STAT 161 ECON 101, ECON 102 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS <p>Course Requirements for Year 3 entry:</p> <p>1-5. Above</p> <ol style="list-style-type: none"> MATH 214, MATH 215 MATH 225 MATH 253 STAT 265, STAT 266 ECON 281 	Mathematics and Finance	<p>High School - No Year 1 entry Transfer - Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>For Year 2 entry - Students must have completed:</p> <ol style="list-style-type: none"> the preceding Fall/Winter with a minimum 3.0 GPA, and Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a minimum 3.0 GPA. <p>For Year 3 Entry - Students must have completed:</p> <ol style="list-style-type: none"> each preceding Fall/ Winter with a minimum 3.0 GPA, and 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a minimum 3.0 GPA. 	<p>High School - No Year 1 entry Transfer - Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>For Year 2 entry - Students must have completed:</p> <ol style="list-style-type: none"> the preceding Fall/Winter with a minimum 2.7 GPA, and Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a minimum 2.7 GPA. <p>For Year 3 Entry - Students must have completed:</p> <ol style="list-style-type: none"> each preceding Fall/ Winter with a minimum 2.7 GPA, and 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a minimum 2.7 GPA. 	<p>Specialization Mathematics and Finance</p> <p>Course requirements for Year 2 entry:</p> <ol style="list-style-type: none"> MATH 154, MATH 156 MATH 125 STAT 161 ECON 101, ECON 102 5. 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS <p>Course Requirements for Year 3 entry:</p> <p>1-5. Above</p> <ol style="list-style-type: none"> MATH 214, MATH 215 MATH 225 MATH 253 STAT 265, STAT 266 ECON 281

		<p>Honors Mathematics and Finance</p> <p>Course requirements for Year 2 entry:</p> <ol style="list-style-type: none"> MATH 117, MATH 118 MATH 127 STAT 161 ECON 101, ECON 102 <p>5. 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS</p> <p>Notes:</p> <ol style="list-style-type: none"> MATH 154 and MATH 156 can be substituted for MATH 117 and MATH 118, respectively. In such cases, applicants should present MATH 216. MATH 125 can serve as a substitute for MATH 127. <p>Course Requirements for Year 3 entry:</p> <p>1-5. Above</p> <ol style="list-style-type: none"> MATH 217, MATH 317 MATH 227 MATH 253 STAT 265, STAT 266 ECON 281 <p>Notes:</p> <ol style="list-style-type: none"> MATH 225 can serve as a 			<p>Honors Mathematics and Finance</p> <p>Course requirements for Year 2 entry:</p> <ol style="list-style-type: none"> MATH 117, MATH 118 MATH 127 STAT 161 ECON 101, ECON 102 <p>5. 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS</p> <p>Notes:</p> <ol style="list-style-type: none"> MATH 154 and MATH 156 can be substituted for MATH 117 and MATH 118, respectively. In such cases, applicants should present MATH 216. MATH 125 can serve as a substitute for MATH 127. <p>Course Requirements for Year 3 entry:</p> <p>1-5. Above</p> <ol style="list-style-type: none"> MATH 217, MATH 317 MATH 227 MATH 253 STAT 265, STAT 266 ECON 281 <p>Notes:</p> <ol style="list-style-type: none"> MATH 225 can serve as a
--	--	--	--	--	--

Calendar Change Request Form for Program and Regulation Changes

			substitute for MATH 227. Applicants presenting MATH 225 will need to include MATH 325 in the degree.				substitute for MATH 227. Applicants presenting MATH 225 will need to include MATH 325 in the degree.
Neuroscience (Faculty of Science and the Division of Neuroscience, Faculty of Medicine and Dentistry)	High School - minimum 80% Transfer - a minimum 3.3 GPA on 30 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	No Specialization program offered.		Neuroscience (Faculty of Science and the Division of Neuroscience, Faculty of Medicine and Dentistry)	High School - minimum 80% Transfer - a minimum 3.3 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	No Specialization program offered.	
Paleontology	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum cumulative average 2.3 GPA over all courses completed and completion of the course requirements outlined at right.	Course requirements: Of the required first year courses for the program, successful completion of at least: BIOL 107 and BIOL 108 CHEM 101 or CHEM 164 EAS 100 and EAS 105 MATH 113 or MATH 114 , or MATH 125 or MATH 134	Paleontology	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School - minimum 75% Transfer - a minimum cumulative average 2.3 GPA over all courses completed and completion of the course requirements outlined at right.	Course requirements: Of the required first year courses for the program, successful completion of at least: BIOL 107 and BIOL 108 CHEM 101 or CHEM 164 EAS 100 and EAS 105 MATH 113 or MATH 114 , or MATH 125 or MATH 134
Pharmacology	High School - minimum 80% Transfer - a minimum 3.0 GPA on all science courses taken in each preceding Fall/Winter, a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter, and a minimum grade of B- in each Department of Pharmacology course. For	High School - minimum 75% Transfer - a minimum 2.7 GPA on all science courses taken in each preceding Fall/Winter, a minimum 2.7 GPA on 24 units of course weight in each preceding Fall/Winter, and a minimum 2.7 GPA in Department of Pharmacology courses for each preceding		Pharmacology	High School - minimum 80% Transfer - a minimum 3.0 GPA on all science courses taken in each preceding Fall/Winter, a minimum 3.0 GPA in each preceding Fall/Winter, and a minimum grade of B- in each Department of Pharmacology course. For admission requirements, see	High School - minimum 75% Transfer - a minimum 2.7 GPA on all science courses taken in each preceding Fall/Winter, a minimum 2.7 GPA in each preceding Fall/Winter, and a minimum 2.7 GPA in Department of Pharmacology courses for each preceding Fall/Winter. For admission	

Calendar Change Request Form for Program and Regulation Changes

	admission requirements, see BSc (Honors)	Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)			BSc (Honors)	requirements, see Bachelor of Science (Specialization)	
Physics	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA on 24 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Physics	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Physiology	High School - minimum 80% Transfer - a minimum 3.0 GPA on 24 units of course weight in each preceding Fall/Winter and a minimum grade of B in PHYSL 212 and PHYSL 214 or a minimum grade of A- in PHYSL 210 . For admission requirements, see BSc (Honors)	No Specialization program offered.		Physiology	High School - minimum 80% Transfer - a minimum 3.0 GPA in each preceding Fall/Winter and a minimum grade of B in PHYSL 212 and PHYSL 214 or a minimum grade of A- in PHYSL 210 . For admission requirements, see BSc (Honors)	No Specialization program offered.	
Planning	No Honors program offered.	Admission to this program is subject to enrolment management and is therefore competitive. Alberta students may be given preference. High School - minimum 75% Transfer - a minimum 2.3 GPA on 18 units of course weight in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)		Planning	No Honors program offered.	Admission to this program is subject to enrolment management and is therefore competitive. Alberta students may be given preference. High School - minimum 75% Transfer - a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Psychology (See also BA)	High School - No Year 1 entry Transfer - a minimum 3.0 GPA	High School - minimum 75% Transfer - a minimum 2.3 GPA		Psychology (See also BA)	High School - No Year 1 entry Transfer - a minimum 3.0 GPA	High School - minimum 75% Transfer - a minimum 2.3 GPA	

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty offering the course has jurisdiction over the approval of reexamination requests. Therefore, we are suggesting a change in language to the Faculty of Science Regulations - Reexaminations section to make it crystal clear that all students are treated equally by the Faculty of Science (regardless of their home Faculty).

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11200>

Current	Proposed
<p>Faculty of Science Regulations</p> <ul style="list-style-type: none"> • • • <p>Reexamination</p> <p>Reexaminations are not normally permitted in the Faculty of Science. Students registered in the Faculty of Science wishing to be considered for a reexamination must, in addition to meeting the requirements set out in Reexaminations, also meet the following conditions:</p> <ol style="list-style-type: none"> 1. Students must provide evidence of a medical 	<p>Faculty of Science Regulations</p> <ul style="list-style-type: none"> • • • <p>Reexamination</p> <p>Reexaminations are not normally permitted in the Faculty of Science. Students seeking a reexamination for a course offered by the Faculty of Science must, in addition to meeting the requirements set out in Reexaminations, also meet the following conditions:</p> <ol style="list-style-type: none"> 1. Students must provide evidence of a medical

<p>condition or similarly compelling circumstance existing at the time of the writing of the final examination; and</p> <ol style="list-style-type: none">2. provide evidence that the student's performance in the final examination was so affected by circumstances as shown in (1) that there was a substantial difference between the final examination results and the term work; and3. excluding the final exam, must have completed at least one-half of the term work. <p>Note: Registrants in BSc degree programs in the Faculty of Science who fail to meet the graduation requirements may be granted a reexamination in one passed or failed Science course taken in the final Fall/Winter or Spring/Summer (last 30 units of course weight or less) provided the maximum number of reexaminations (12 units) has not been previously taken. Such courses must qualify for reexamination, according to Reexaminations.</p>	<p>condition or similarly compelling circumstance existing at the time of the writing of the final examination; and</p> <ol style="list-style-type: none">2. provide evidence that the student's performance in the final examination was so affected by circumstances as shown in (1) that there was a substantial difference between the final examination results and the term work; and3. excluding the final exam, must have completed at least one-half of the term work. <p>Note: Registrants in BSc degree programs in the Faculty of Science who fail to meet the graduation requirements may be granted a reexamination in one passed or failed Science course taken in the final Fall/Winter or Spring/Summer (last 30 units of course weight or less) provided the maximum number of reexaminations (12 units) has not been previously taken. Such courses must qualify for reexamination, according to Reexaminations.</p>
--	--

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs. Faculty Approval: October 7, 2022
Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty offering the course has jurisdiction over the approval of reexamination requests. Therefore, we are suggesting a change in language to the Academic Regulations - Reexaminations section to make it crystal clear that all students are treated equally by the Faculty of Science (regardless of their home Faculty). We also request that Note 1 be removed (as this information is provided in the Reexamination section of the Faculty of Science Regulations page). However, should the RO/Calendar Editor wish to turn the Faculty of Science reference in the very first paragraph into a new Note 1, we'd be okay with that, too.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11176#reexaminations>

Current	Proposed
<p>Reexaminations</p> <p>1. Undergraduate students who have written and submitted a final examination may be considered for a reexamination provided the following conditions are met. Students in Medicine and Dentistry should consult Academic Standing and Graduation and the Faculty Office for these regulations. Students in Business should consult Reexaminations. Students in Science should consult Reexamination. Reexaminations are not permitted for graduate students.</p> <p>a. The course was failed.</p>	<p>Reexaminations</p> <p>1. Undergraduate students who have written and submitted a final examination may be considered for a reexamination provided the following conditions are met. Students in Medicine and Dentistry should consult Academic Standing and Graduation and the Faculty Office for these regulations. Students in Business should consult Reexaminations. Students seeking a reexamination for a course offered by the Faculty of Science should consult Reexamination. Reexaminations are not permitted for graduate students.</p> <p>a. The course was failed.</p>

<p>b. The final examination is 40 percent or greater, as originally scheduled for the class as a whole.</p> <p>c. For a Fall Term course, the student achieved a Term Grade Point Average of 2.0 inclusive of the failed course. For Winter Term and Fall/Winter courses, a Fall/Winter GPA of 2.0 inclusive of the failed course.</p> <p>d. Students are advised that it may not be possible to make a ruling until all grades for a term or two-term period are recorded. Students for whom a term GPA cannot be computed at the end of the Fall Term will have to wait for the computation of a GPA following the Winter Term. In this case, the Application for Reexamination form should be left with the Faculty office for a later ruling. Faculty of Law students in the first and second year and all Faculty of Pharmacy and Pharmaceutical Sciences students will be considered for a reexamination on the basis of the computation of their Fall/Winter GPA.</p> <p>2. Reexaminations are Not Permitted:</p> <p>a. For students who were granted a deferred final examination in accordance with Absence from Final Exams but did not write.</p> <p>b. Dentistry and Dental Hygiene students: In clinical and laboratory courses.</p> <p>c. Faculty of Nursing: For students who have failed the clinical/laboratory component of a Nursing course and for students repeating a year.</p> <p>d. Faculty of Rehabilitation Medicine: For students repeating courses at the undergraduate level.</p> <p>e. Faculty of Graduate Studies and Research.</p> <p>f. Medical Students: For students repeating a year.</p> <p>g. Faculty of Pharmacy and Pharmaceutical Sciences: A student on probation is not allowed reexamination privileges.</p> <p>h. Faculty of Medicine and Dentistry: Bachelor of Science in Radiation Therapy: for students who fail any clinical course in the Radiation Therapy program (BSc Program in Radiation Therapy)</p> <p>3. Reexamination Mark: The mark received for the reexamination replaces the original final examination mark and is used in computing the final grade in the course.</p> <p>4. Weight of Reexamination: The percentage of the final grade allotted to the reexamination shall be the same as the percentage of the final grade allotted to the student's final examination in the course.</p> <p>5. Number of Reexaminations that May be Granted: Reexamination may be granted in one course only, regardless of the units of course weight, in a Fall/Winter or Spring/Summer period. Reexaminations may be granted in courses to a total of 12 units of course weight while the student is enrolled in a Faculty (Dentistry and Dental Hygiene students see Note 2).</p> <p>6. Reexamination Deadlines:</p> <p>a. Fall Term Courses: Apply: Within 10 days of the posting of the results.</p>	<p>b. The final examination is 40 percent or greater, as originally scheduled for the class as a whole.</p> <p>c. For a Fall Term course, the student achieved a Term Grade Point Average of 2.0 inclusive of the failed course. For Winter Term and Fall/Winter courses, a Fall/Winter GPA of 2.0 inclusive of the failed course.</p> <p>d. Students are advised that it may not be possible to make a ruling until all grades for a term or two-term period are recorded. Students for whom a term GPA cannot be computed at the end of the Fall Term will have to wait for the computation of a GPA following the Winter Term. In this case, the Application for Reexamination form should be left with the Faculty office for a later ruling. Faculty of Law students in the first and second year and all Faculty of Pharmacy and Pharmaceutical Sciences students will be considered for a reexamination on the basis of the computation of their Fall/Winter GPA.</p> <p>2. Reexaminations are Not Permitted:</p> <p>a. For students who were granted a deferred final examination in accordance with Absence from Final Exams but did not write.</p> <p>b. Dentistry and Dental Hygiene students: In clinical and laboratory courses.</p> <p>c. Faculty of Nursing: For students who have failed the clinical/laboratory component of a Nursing course and for students repeating a year.</p> <p>d. Faculty of Rehabilitation Medicine: For students repeating courses at the undergraduate level.</p> <p>e. Faculty of Graduate Studies and Research.</p> <p>f. Medical Students: For students repeating a year.</p> <p>g. Faculty of Pharmacy and Pharmaceutical Sciences: A student on probation is not allowed reexamination privileges.</p> <p>h. Faculty of Medicine and Dentistry: Bachelor of Science in Radiation Therapy: for students who fail any clinical course in the Radiation Therapy program (BSc Program in Radiation Therapy)</p> <p>3. Reexamination Mark: The mark received for the reexamination replaces the original final examination mark and is used in computing the final grade in the course.</p> <p>4. Weight of Reexamination: The percentage of the final grade allotted to the reexamination shall be the same as the percentage of the final grade allotted to the student's final examination in the course.</p> <p>5. Number of Reexaminations that May be Granted: Reexamination may be granted in one course only, regardless of the units of course weight, in a Fall/Winter or Spring/Summer period. Reexaminations may be granted in courses to a total of 12 units of course weight while the student is enrolled in a Faculty (Dentistry and Dental Hygiene students see Note 2).</p> <p>6. Reexamination Deadlines:</p> <p>a. Fall Term Courses: Apply: Within 10 days of the posting of the results.</p>
---	---

<p>Exam to be held by: End of Reading Week (see Academic Schedule)</p> <p>b. Winter Term and Fall/Winter Courses: Apply: Within 10 days of the posting of the results. Exam to be held by: June 30 (see Academic Schedule)</p> <p>c. Spring/Summer Courses: Apply: Within 10 days of the posting of the results. Exam to be held by: August 31* *Exam to be held by October 20 for students taking 13-week classes in Engineering programs.</p> <p>d. Special Faculty Provisions: Faculty of Law: See Note (3) below Dentistry and Dental Hygiene: See Note (2) below and consult the Department. Medicine: Consult the Faculty Office. Pharmacy and Pharmaceutical Sciences: See Reexamination procedure.</p> <p>7. Procedures to Apply for a Reexamination: Students who wish to apply for a reexamination should:</p> <ol style="list-style-type: none"> Ensure that they meet the eligibility criteria for application noted above. Complete an application form (available at the Faculty or Department responsible for the course). Have the application for reexamination approved by the Faculty or Department offering the course. The Dean or delegate of the student's Faculty must also give final approval of the application. <p>Refer Obtaining and Paying Your Fee Assessment for details on where to pay fees and to Schedule of Fees for Special Services for fees for special services. Payment of the required fee will normally be made at the time of approval of the application but must be made no later than two weeks after approval. Once approval has been granted reexaminations are to be written at a time and place agreed upon by the instructor and the students concerned. Dentistry students write by August 15. Normally, students in the Faculty of Law write in June. Refer to the Academic Schedule for the applicable dates.</p> <p>Notes</p> <ol style="list-style-type: none"> Science Students: Registrants in the BSc degree programs or Special Certificate programs in the Faculty of Science who fail to meet the graduation GPA may be granted a reexamination in a passed or failed Science course taken in the final Fall/Winter or Spring/Summer (last 30 units of course weight or less) provided the maximum number of reexaminations (12 units of course weight) has not been previously taken. Arts Students: Students registered in the Faculty of Arts should consult Reexaminations for additional regulations concerning reexaminations for Arts students. Dentistry Students: Students in the Dentistry program should consult Reexaminations and students in the 	<p>Exam to be held by: End of Reading Week (see Academic Schedule)</p> <p>b. Winter Term and Fall/Winter Courses: Apply: Within 10 days of the posting of the results. Exam to be held by: June 30 (see Academic Schedule)</p> <p>c. Spring/Summer Courses: Apply: Within 10 days of the posting of the results. Exam to be held by: August 31* *Exam to be held by October 20 for students taking 13-week classes in Engineering programs.</p> <p>d. Special Faculty Provisions: Faculty of Law: See Note (3) below Dentistry and Dental Hygiene: See Note (2) below and consult the Department. Medicine: Consult the Faculty Office. Pharmacy and Pharmaceutical Sciences: See Reexamination procedure.</p> <p>7. Procedures to Apply for a Reexamination: Students who wish to apply for a reexamination should:</p> <ol style="list-style-type: none"> Ensure that they meet the eligibility criteria for application noted above. Complete an application form (available at the Faculty or Department responsible for the course). Have the application for reexamination approved by the Faculty or Department offering the course. The Dean or delegate of the student's Faculty must also give final approval of the application. <p>Refer Obtaining and Paying Your Fee Assessment for details on where to pay fees and to Schedule of Fees for Special Services for fees for special services. Payment of the required fee will normally be made at the time of approval of the application but must be made no later than two weeks after approval. Once approval has been granted reexaminations are to be written at a time and place agreed upon by the instructor and the students concerned. Dentistry students write by August 15. Normally, students in the Faculty of Law write in June. Refer to the Academic Schedule for the applicable dates.</p> <p>Notes</p> <ol style="list-style-type: none"> Arts Students: Students registered in the Faculty of Arts should consult Reexaminations for additional regulations concerning reexaminations for Arts students. Dentistry Students: Students in the Dentistry program should consult Reexaminations and students in the
--	---

<p>Advanced Placement program should consult Reexaminations or the Chair, Dentistry, 5-478 ECHA, for regulations concerning reexaminations.</p> <p>Dental Hygiene Students: Students in the Dental Hygiene program should consult Reexaminations or the Chair, Dentistry, 5-478 ECHA, for regulations concerning reexaminations.</p> <p>4. Law Students:</p> <ol style="list-style-type: none"> a. Reexaminations shall be taken only in June except under the circumstances as described in b. below. The deadline for application is May 30. b. Where a student fails one course in the Fall Term of their final year, the student may write one reexamination at a time before June, provided that the student attains a GPA of no less than 2.0, calculated on the basis of final grades obtained in Fall Term. The deadline for application is February 2. The rules governing the times for setting of deferred examinations in Fall/Winter Deferred Final Exams shall apply to reexaminations written in accordance with this section. 	<p>Advanced Placement program should consult Reexaminations or the Chair, Dentistry, 5-478 ECHA, for regulations concerning reexaminations.</p> <p>Dental Hygiene Students: Students in the Dental Hygiene program should consult Reexaminations or the Chair, Dentistry, 5-478 ECHA, for regulations concerning reexaminations.</p> <p>3. Law Students:</p> <ol style="list-style-type: none"> a. Reexaminations shall be taken only in June except under the circumstances as described in b. below. The deadline for application is May 30. b. Where a student fails one course in the Fall Term of their final year, the student may write one reexamination at a time before June, provided that the student attains a GPA of no less than 2.0, calculated on the basis of final grades obtained in Fall Term. The deadline for application is February 2. The rules governing the times for setting of deferred examinations in Fall/Winter Deferred Final Exams shall apply to reexaminations written in accordance with this section.
---	---

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
 Faculty Approval: October 7, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

FINAL Item No. 5

**Governance Executive Summary
Action Item**

Agenda Title	Proposed Changes to Indigenous Admissions for the BSc in Dental Hygiene and the Doctor of Dental Surgery Programs, Faculty of Medicine and Dentistry
---------------------	---

Motion

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the proposed changes to admission requirements and regulations for the Doctor of Dental Surgery and Bachelor of Science (Dental Hygiene) Programs, as proposed by the Faculty of Medicine and Dentistry and as set forth in Attachments 1-2, to take effect for Fall 2024.

Item

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Brenda Hemmelgarn, Dean, Faculty of Medicine and Dentistry Paul Major, Chair, School of Dentistry, Faculty of Medicine and Dentistry
Presenter(s)	Steve Patterson, Associate Chair Academic, School of Dentistry Ava Chow, Co-Chair, Undergraduate Admissions Committee, Dental Hygiene Program, School of Dentistry Rachelle Pratt, Interim Director, Dental Hygiene Program, School of Dentistry

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	<p>The purpose of this proposal is to remove the limits of two students admitted to the Doctor of Dental Surgery Program and two students admitted to the Bachelor of Science (Dental Hygiene) Program through the Indigenous admissions selection process and allow for all eligible applicants through this process to be recommended for admission to the School of Dentistry Admissions Committee.</p> <p>In light of the underrepresentation of Indigenous peoples in health professions and the University’s commitment to a respectful, meaningful, and sustainable response to the Truth and Reconciliation Calls to Action, the School of Dentistry seeks to increase the number of qualified Indigenous applicants who can be admitted to both the Doctor of Dental Surgery and Dental Hygiene Programs. An increase in the number of Indigenous dentists and dental hygienists has an important impact on Indigenous health outcomes. These professionals are a vital part of supporting improved health outcomes of all people, but to Indigenous peoples specifically.</p> <p>Additionally, changes to the minimum GPA requirement for entry to the Doctor of Dental Surgery Program are being proposed, with a change from the current 3.5 GPA to 3.3, in an effort to support the School of Dentistry’s efforts to admit a well prepared group of learners who are</p>



	academically prepared to be successful in the rigorous dentistry program.
<p>Executive Summary <i>(outline the specific item – and remember your audience)</i></p>	<p>Doctor of Dental Surgery (DDS) and Dental Hygiene (DH) Programs – Proposal for Removal of Quota Positions for Indigenous Applicants: There are currently two streams for entry into both the DDS Program and the Bachelor of Science (Dental Hygiene) program for self-declared Indigenous applicants. Applicants are considered both in the Alberta pool and Indigenous pool.</p> <p>Currently there is a quota in place that determines the number of seats for Alberta and non-Alberta residents in both programs. Students applying through the Indigenous admissions process for either program are considered to be Alberta residents.</p> <p>The Indigenous admissions process maintains the academic requirements of the general admissions process but includes assessment methods that are more culturally supportive. Applications are considered by the Indigenous Health Initiatives (IHI) Admission Committee who subsequently makes recommendations to the School of Dentistry Admissions Committee. In accordance with accreditation requirements for each of the programs, it is the School of Dentistry Admissions Committee that makes the final decision on admission for students entering each of the programs from either pool.</p> <p>Currently there are up to 2 positions set aside in each of the DDS and DH programs for students applying through the Indigenous admissions selection process. There is no change proposed to the current admission processes. Rather, this proposal would remove the limitation on the number of students admitted through the Indigenous admissions process, allowing all students who are successful in this process to be recommended for admission to the School of Dentistry Admissions Committee.</p> <p>This proposal is in alignment with other professional programs in the FoMD.</p> <p>The quota seat allocations have been revised to reflect there will no longer be a limited number of Indigenous seats:</p> <p>Previously, the allocation for the DH Program was: 36 positions for Albertans (85%), 4 positions for other applicants (10%), 2 positions for Indigenous applicants (5%), for a total of 42 positions yearly.</p> <p>For the DDS Program, the previous allocation was: 27 positions for Albertans (85%), 3 positions for non-Albertans (10%), and 2 positions for Indigenous applicants (5%), for a total of 32 positions yearly.</p> <p>Doctor of Dental Surgery – GPA Requirement Change: Reducing the requirement of a minimum GPA from 3.5 to 3.3 continues to support the School's efforts to admit a well prepared group of</p>

Item No. 5

	<p>learners who are academically prepared to successfully complete the rigorous dentistry program, while recognizing that GPA can often be so heavily weighted, thus admitting a very select group of students where other desirable admissions criteria factors do not have sufficient influence in the decision process.</p> <p>Setting a minimum standard for GPA demonstrates that all eligible students in the admissions process will have the necessary academic preparation and will allow for a more holistic approach to selection, bringing other non-cognitive measures into play.</p>
Supplementary Notes and context	<This section is for use by University Governance only to outline governance process.>

Engagement and Routing (Include meeting dates)

Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity) <For information on the protocol see the Governance Resources section Student Participation Protocol >	<u>Those who are actively participating:</u> <ul style="list-style-type: none"> • Dr. Steven Patterson, Associate Chair Academic, School of Dentistry • Ms. Rachelle Pratt, Interim Director, Dental Hygiene Program, School of Dentistry • Dr. Ava Chow, Associate Professor, Co-Chair Undergraduate Admissions Committee, School of Dentistry • Ms. Melanie Grams, Admissions Officer, School of Dentistry
	<u>Those who have been consulted:</u> <ul style="list-style-type: none"> • FoMD Faculty Learning Committee – approval – September 15, 2022 • FoMD Faculty Council Committee (for review) – October 5, 2022 • Undergraduate Program Support Team (UPST) – October 27, 2022 • School of Dentistry Department Council - September 2022 • School of Dentistry Undergraduate Admissions Committee - June 28, 2022 • IHI Admissions Committee Representative
	<u>Those who have been informed:</u> <ul style="list-style-type: none"> • Registrar’s Office • Student Representatives from the DDS, Dental Hygiene and Advanced Placement Programs
Approval Route (Governance) (including meeting dates)	Faculty Learning Committee (Faculty Council-delegated Approver), September 15, 2022 Program Support Team (for consultation), October 27, 2022 GFC Programs Committee, November 17, 2022

Strategic Alignment

Alignment with <i>For the Public Good</i>	<p>Objective 1 - Build a diverse, inclusive community of exceptional undergraduate and graduate students from Edmonton, Alberta, Canada, and the world.</p> <p>Objective 4 - Develop, in consultation and collaboration with internal and external community stakeholders, a thoughtful, respectful, meaningful, and sustainable response to the report of the Truth and Reconciliation</p>
---	---

Item No. 5

	Commission of Canada. Objective 9 - Enhance, support, and mobilize the unique experiences and cultures of all University of Alberta campuses to the benefit of the university as a whole.	
Alignment with Core Risk Area	Please note below the specific institutional risk(s) this proposal is addressing.	
	<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input checked="" type="checkbox"/> Relationship with Stakeholders <input checked="" type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success
Legislative Compliance and jurisdiction	<i>Post-Secondary Learning Act</i> GFC Programs Committee Terms of Reference	

Attachments (each to be numbered 1 - 2)

1. DDS Calendar Change (Indigenous seats, quota & minimum OGPA) (page(s) 1 - 4)
2. Dental Hygiene Calendar Change (Indigenous seats) (page(s) 1 – 3)

Prepared by: Jocelyn Plemel, Executive Assistant to the Vice-Dean, Education, jplemel@ualberta.ca
 Melanie Grams, Admissions Officer, School of Dentistry, mgrams@ualberta.ca

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD - Dentistry	
Contact Person:	melanie.grams@ualberta.ca	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2024	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	no	

Rationale

Quota:

In light of the University's commitment to a respectful, meaningful, and sustainable response to the Truth and Reconciliation Calls to Action, the School of Dentistry seeks to increase the number of qualified Indigenous applicants who can be admitted. An increase in the number of Indigenous dentists has an important impact on Indigenous health outcomes. These professionals are a vital part of supporting improved health outcomes of all people, but to Indigenous peoples specifically.

There are currently two streams for entry into the DDS program for self-declared Indigenous applicants. Applicants are considered both in the Alberta pool and Indigenous pool. The Indigenous admissions process maintains the same academic requirements of the general process but includes assessment methods which are more culturally supportive. Applications are considered by the Indigenous Health Initiatives (IHI) Admission Committee who subsequently makes recommendations to the School of Dentistry Admissions Committee. In accordance with accreditation requirements for the program, it is the School of Dentistry Admissions Committee which makes the final admission decisions for students entering the program from either pool. Currently there are up to 2 positions set aside for students applying through the Indigenous admissions selection process. There is no change proposed to the current admission processes. This proposal would remove the limitation on the number of students admitted through the Indigenous pool, allowing all students who are successful in this process to be recommended for admission to the School of Dentistry Admissions Committee.

This proposal is also in alignment with other professional programs in the FoMD.

GPA:

Reducing the requirement of a minimum GPA from 3.5 to 3.3 continues to support the School's efforts to admit a well prepared group of learners who are academically prepared to successfully complete the rigorous dentistry program, while recognizing that GPA can often be so heavily weighted, thus admitting a very select group of students where other desirable admissions criteria factors do not have sufficient influence in the decision process.

Setting a minimum standard for GPA demonstrates that all eligible students in the admissions process will have the necessary academic preparation and will allow for a more holistic approach to selection, bringing other non-cognitive measures into play.

Calendar Copy

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11300#doctor-of-dental-surgery-dds>

Current

Doctor of Dental Surgery (DDS)

Application for Admission and Application for Readmission

Only electronic applications will be accepted. To access the online application for the University of Alberta go to www.admissions.ualberta.ca.

For detailed application and program information please visit www.dentistry.ualberta.ca.

Note: Applicants who have been Required to Withdraw, or equivalent, from any postsecondary program will not be considered for admission.

Enrolment: Enrolment is limited to an annual quota of 30 students. Of the 30 positions available 27 are reserved for Alberta residents, and up to 3 are available for non-Alberta residents. No non-resident shall be admitted to the DDS Program who is less qualified than any Alberta resident who is denied admission to that Program (see Residence Requirements).

Indigenous Applicants: Besides the regular quota positions, an additional two (2) positions per year are available in the DDS program for qualified students of Aboriginal identity, within the meaning of the Constitution Act of 1982, Section 35, Part 2. Applicants interested in this program should contact the Administrator, Indigenous Health Initiatives, Faculty of Medicine and Dentistry. See also Admission of Indigenous Applicants.

Proposed

Doctor of Dental Surgery (DDS)

Application for Admission and Application for Readmission

Only electronic applications will be accepted. To access the online application for the University of Alberta go to www.admissions.ualberta.ca.

For detailed application and program information please visit www.dentistry.ualberta.ca.

Note: Applicants who have been Required to Withdraw, or equivalent, from any postsecondary program will not be considered for admission.

Enrolment: Enrolment is limited to an annual quota of 32 students. Of the 32 positions, 90% will be reserved for qualified Alberta residents and up to 10% for qualified non-Alberta residents. No non-resident shall be admitted to the DDS Program who is less qualified than any Alberta resident who is denied admission to that Program (see [Residence Requirements](#)).

Indigenous Applicants: The Faculty of Medicine and Dentistry is committed to the recruitment, retention and graduation of Indigenous students. All Indigenous applicants who meet the academic eligibility requirements as outlined in [Doctor of Dentistry\(DDS\)](#) and who are successful in the Indigenous admissions process will be recommended by the Indigenous Admissions Subcommittee to the School of Dentistry Admissions Committee for admission. For information on the Indigenous admission process visit www.dentistry.ualberta.ca.

Students who are of Indigenous identity within the meaning of the Constitution Act, 1982, Section 35(2) will be considered in this category.

Because the number of candidates who meet the minimum requirements for admission far exceeds the quota, it should be understood that eligibility does not guarantee admission. Admission is determined on a competitive basis.

Eligibility Criteria for Admission

1. **Academic Requirements:** The minimum requirement for admission to the DDS Program is the satisfactory completion of 60 units of course weight of transferable postsecondary work.

The pre-professional requirements are:

1. General Chemistry (3 units)
2. Organic Chemistry (3 units)
3. Biology (3 units) ([BIOL 107](#) or equivalent required)
4. Microbiology (3 units)
5. English (6 units)
6. Statistics (3 units)
7. Introductory Biochemistry (3 units)
8. Human Physiology (6 units) ([PHYSL 210](#) or equivalent required)

The requirements can be met in various patterns in different faculties. Students are urged to take the program that they find most interesting and that will still give them these prerequisites.

2. **Course Load:** The minimum requirement for admission is two (2) academic years of Fall/Winter semesters with a full course load of 30 units of course weight in each year.
3. **GPA:** A minimum GPA of **3.5** is required for admission.
For applicants who have completed four or more years of transferable postsecondary work, the cumulative (overall) GPA is calculated with the deletion of the lowest Fall/Winter GPA, provided it is not the most recent Fall/Winter or one of the two Fall/Winter academic year when a full course load of 30 units of course weight was taken.

Indigenous student applicants and prospective students should contact the Administrator, Indigenous Health Initiatives Program, Faculty of Medicine and Dentistry for individual counseling and career planning. See also [Admission of Indigenous Applicants](#).

Because the number of candidates who meet the minimum requirements for admission far exceeds the quota, it should be understood that eligibility does not guarantee admission. Admission is determined on a competitive basis.

Eligibility Criteria for Admission

1. **Academic Requirements:** The minimum requirement for admission to the DDS Program is the satisfactory completion of 60 units of course weight of transferable postsecondary work.

The pre-professional requirements are:

1. General Chemistry (3 units)
2. Organic Chemistry (3 units)
3. Biology (3 units) ([BIOL 107](#) or equivalent required)
4. Microbiology (3 units)
5. English (6 units)
6. Statistics (3 units)
7. Introductory Biochemistry (3 units)
8. Human Physiology (6 units) ([PHYSL 210](#) or equivalent required)

The requirements can be met in various patterns in different faculties. Students are urged to take the program that they find most interesting and that will still give them these prerequisites.

2. **Course Load:** The minimum requirement for admission is two (2) academic years of Fall/Winter semesters with a full course load of 30 units of course weight in each year.
3. **GPA:** A minimum GPA of **3.3** is required for admission.
For applicants who have completed four or more years of transferable postsecondary work, the cumulative (overall) GPA is calculated with the deletion of the lowest Fall/Winter GPA, provided it is not the most recent Fall/Winter or one of the two Fall/Winter academic year when a full course load of 30 units of course weight was taken.

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 15, 2022
FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	FoMD - Dentistry	
Contact Person:	melanie.grams@ualberta.ca	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2024	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	no	

Rationale

In light of the underrepresentation of Indigenous peoples in health professions, and the University's commitment to a respectful, meaningful, and sustainable response to the Truth and Reconciliation Calls to Action the School of Dentistry seeks to increase the number of qualified Indigenous applicants who can be admitted. An increase in the number of Indigenous dental hygienists has an important impact on Indigenous health outcomes. These professionals are a vital part of supporting improved health outcomes of all people, but to Indigenous peoples specifically.

There are currently two streams for entry into the Bachelor of Science (Dental Hygiene) program for self-declared Indigenous applicants. Applicants are considered both in the Alberta pool and Indigenous pool. The Indigenous admissions process maintains the academic requirements of the general process but includes assessment methods which are more culturally supportive. Applications are considered by the Indigenous Health Initiatives (IHI) Admission Committee who subsequently makes recommendations to the School of Dentistry Admissions Committee. In accordance with accreditation requirements for the program, it is the School of Dentistry Admissions Committee which makes the final admission decisions for students entering the program from either pool. Currently there are up to 2 positions set aside for students applying through the Indigenous admissions selection process. There is no change proposed to the current admission processes. This proposal would remove the limitation on the number of students admitted through the Indigenous pool, allowing all students who are successful in this process to be recommended for admission to the School of Dentistry Admissions Committee.

This proposal is also in alignment with other professional programs in the FoMD.

The quota seat allocation has been revised to reflect there will no longer be a limited number of Indigenous seats. Previously, the allocation was: 36 positions for Albertans (85%), 4 positions for other applicants (10%), 2 positions for indigenous applicants (5%).

Calendar Copy

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11300#bachelor-of-science-dental-hygiene>

Current

Bachelor of Science (Dental Hygiene)

Application for Admission and Application for Readmission

Only electronic applications will be accepted. To access the online application for the University of Alberta please visit www.admissions.ualberta.ca.

For detailed application and program information please visit www.dentistry.ualberta.ca.

Enrolment: Enrolment is limited to an annual quota of 40 students. Of the 40 positions available 36 are reserved for Alberta residents, and up to 4 available for Non-Alberta residents. No non-resident shall be admitted to the Dental Hygiene Program who is less qualified than any Alberta resident who is denied admission to that Program (see Residence Requirements).

Indigenous Applicants:

Besides the regular quota positions, an additional two (2) positions per year are available in the Dental Hygiene program for qualified applicants of Aboriginal identity, within the meaning of the Constitution Act of 1982, Section 35(2). Applicants interested in this program should contact the Administrator, Indigenous Health Initiatives, Faculty of Medicine and Dentistry. See also Admission of Indigenous Applicants.

Proposed

Bachelor of Science (Dental Hygiene)

Application for Admission and Application for Readmission

Only electronic applications will be accepted. To access the online application for the University of Alberta go to www.admissions.ualberta.ca.

For detailed application and program information please visit www.dentistry.ualberta.ca.

Enrolment: Enrolment is limited to an annual quota of 42 students. Of the 42 positions, 90% will be reserved for qualified Alberta residents and up to 10% for qualified non Alberta residents. No non-resident shall be admitted to the Dental Hygiene Program who is less qualified than any Alberta resident who is denied admission to that Program (see [Residence Requirements](#)).

Indigenous Applicants: The Faculty of Medicine and Dentistry is committed to the recruitment, retention and graduation of Indigenous students. All Indigenous applicants who meet the academic eligibility requirements as outlined in [Bachelor of Science \(Dental Hygiene\)](#) and who are successful in the Indigenous admissions process will be recommended by the Indigenous Admissions Subcommittee to the School of Dentistry Admissions Committee for admission.

Students who are of Indigenous identity within the meaning of the Constitution Act, 1982, Section 35(2) will be considered in this category.

Indigenous student applicants and prospective students should contact the Administrator, Indigenous Health Initiatives Program, Faculty of Medicine and Dentistry for individual counseling and career planning. See also [Admission of Indigenous Applicants](#).

Because the number of candidates who meet the minimum requirements for admission far exceeds the quota, it should be understood that eligibility does not guarantee admission. Admission is determined on a competitive basis.

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – September 15, 2022 FoMD Faculty Council (for information/suggestions/challenges) – October 5, 2022
--

Other consultation groups, departments, or internal faculty approving bodies and approval dates.
--

**Governance Executive Summary
Action Item**

Agenda Title	Proposed New Ministry-approved Specializations in Astrophysics, Environmental Earth Sciences, and Paleontology, Faculty of Science
---------------------	---

Motion

<p>Motion 1 THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Astrophysics as a new Ministry-approved specialization effective July 1, 2024.</p> <p>Motion 2 THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Environmental Earth Sciences as a new Ministry-approved specialization effective July 1, 2024.</p> <p>Motion 3 THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the addition of Paleontology as a new Ministry-approved specialization effective July 1, 2024.</p>

Item

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Frederick West, Acting Dean, Faculty of Science
Presenter(s)	Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	The proposal is before the committee because although we've been offering Specialization and Honors programs in Astrophysics, Environmental Earth Sciences, and Paleontology for many years, these subject areas were never properly entered into the Ministry's database (they are currently miscategorized under Physics and Earth Sciences). This is a purely administrative update.
Executive Summary <i>(outline the specific item – and remember your audience)</i>	<p>Since we have been offering Specialization and Honors programs in Astrophysics, Environmental Earth Sciences and Paleontology for many years, there is effectively no impact or financial implications; these subject areas will continue to be offered as high-quality Majors and Honors programs under the new degree framework as part of the BSc Renewal Project.</p> <p>This proposal aims to correct the Ministry's program record. To this end, we have been given permission to submit abbreviated templates that only include the program of study and Calendar language (see attachments).</p>
Supplementary Notes and context	<This section is for use by University Governance only to outline governance process.>

Engagement and Routing (Include meeting dates)

Item No. 6.A

Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity) <For information on the protocol see the Governance Resources section Student Participation Protocol >	<u>Those who are actively participating:</u> <ul style="list-style-type: none"> • Associate Chairs (Undergraduate), Faculty of Science; various meetings between 2019 and 2022 • Academic advisors and recruiters, Faculty of Science; various meetings between 2019 and 2022
	<u>Those who have been consulted:</u> <ul style="list-style-type: none"> • Provost's Office (Vice-Provost, Programs); various meetings between 2019 and 2022
	<u>Those who have been informed:</u> <ul style="list-style-type: none"> • N/A
Approval Route (Governance) (including meeting dates)	Department of Physics Council (approval obtained September 15, 2022) Department of Earth and Atmospheric Sciences Council (approval obtained October 14, 2022) Programs Support Team (October 27, 2022) Science Faculty Council (approval obtained October 28, 2022) GFC Programs Committee (November 17, 2022)

Strategic Alignment

Alignment with <i>For the Public Good</i>	Engage 17 - Facilitate, build, and support interdisciplinary, cross-faculty, and cross-unit engagement and collaboration. Sustain 21 - Encourage continuous improvement in administrative, governance, planning, and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals.		
Alignment with Core Risk Area	Please note below the specific institutional risk(s) this proposal is addressing.		
	<table border="0"> <tr> <td> <input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure </td> <td> <input type="checkbox"/> Relationship with Stakeholders <input type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success </td> </tr> </table>	<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input type="checkbox"/> Relationship with Stakeholders <input type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success
<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input type="checkbox"/> Relationship with Stakeholders <input type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success		
Legislative Compliance and jurisdiction	<i>Post-Secondary Learning Act</i> GFC Committees Terms of Reference		

Attachments

1. Astrophysics - New Ministry Specialization Template (pages 1 - 13)
2. Environmental Earth Sciences - New Ministry Specialization Template (pages 1 - 13)
3. Paleontology - New Ministry Specialization Template (pages 1 - 14)

Prepared by: Michelle Spila, Assistant Lecturer, Dept. of Earth & Atmospheric Sciences, spila@ualberta.ca
 Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science, sciadu@ualberta.ca

Proposal Template: New Bachelor's Degree Programs and Specializations (Part A: System Co-ordination Review)

Complete this template for proposals for new bachelor's degree programs or specializations. Institutions should:

- ensure that submission content is concise. Any additional information may be appended;
- indicate “not applicable” when questions are not relevant to a particular proposal; and
- ensure that applicable supporting documents are attached to the proposal.

SECTION A: PROPOSAL OVERVIEW

Basic Information *(Complete the table below)*

Institution	University of Alberta
Program Name	Bachelor of Science
Specialization Name	Astrophysics
Credential Awarded	Bachelor of Science
Proposed Effective Date	July 1, 2024

Type of Initiative *(Answer the following questions)*

This is a proposal for (select one from the drop-down menu):

New specialization(s) (majors) in an existing bachelor's degree program

As authorized by the Ministry per correspondence with the Provost, this is an administrative update which is being submitted in order to bring the program record up to date. Enrolments in Astrophysics were previously counted under the Physics specialization.

As requested by the Ministry, a copy of the program of study (courses and credit values) are included in Appendices A and B.

SECTION B: OVERVIEW OF PROPOSED PROGRAM OF STUDY

1. Program Description *(Answer the following questions)*

a. Attach (as an appendix to this proposal) a concise program description document that includes:

- 3-4 sentence calendar description of the program,
- a proposed program of study including course names, descriptions, credits and prerequisites, by semester or year of study,
- program location (i.e., campus locations and/or off-site locations), and delivery mode (i.e., face-to-face, online, or blended), and
- program learning outcomes.

<p>b. Where applicable, identify planned collaborations with other post-secondary institutions, departments within the institution or other organizations that this program respectively facilitates or provides for.</p> <ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:
2. Work Integrated Learning (If applicable, answer the following questions)
<p>a. Identify the number of placements required in the program (including type of work setting and duration/timing of activities).</p> <ul style="list-style-type: none"> • Not applicable -- Astrophysics students are eligible to participate in the Science Internship Program (SIP), in which 4-, 6-, 8- and 12-months internships are available at a variety of work settings.
<p>b. Summarize communications with employers (append applicable letters of support, minutes of program advisory committee meetings, etc.) showing that sufficient placements will be available when needed.</p> <ul style="list-style-type: none"> • Not applicable
<p>c. Comment on whether/how work integrated learning placements in other programs (at the institution or at other institutions within the Alberta Adult Learning System) may be impacted as a result of this program.</p> <ul style="list-style-type: none"> • Not applicable
3. Endorsement of and/or Support for Program (If applicable)
<p>a. Describe endorsement(s) from relevant professional organizations, regulatory bodies, advisory committees, employers, and/or industry.</p> <ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:

SECTION C: ENROLMENT PLANNING

1. (a) Projected Student Enrolment (Complete the table below as applicable).

Proposed Enrolment	1 st Year of Implementation	2 nd Year of Implementation	3 rd Year of Implementation	4 th Year of Implementation	Annual Ongoing
Total Headcount	0	0	0	0	0
• 1 st Year of Study	0	0	0	0	0
• 2 nd Year of Study	0	0	0	0	0
• 3 rd Year of Study	0	0	0	0	0
• 4 th Year of Study	0	0	0	0	0
Anticipated No. of Graduates	0	0	0	0	0
Reviewer's Comment:					

•
Reviewer's Comment:
2. Learner Pathways
a. To what extent will learners be able to transfer credits to and from other post-secondary institutions?
•
b. What types of further studies, if not within the same field, would graduates be most likely to pursue?
•
Reviewer's Comment:
3. Societal and Community Benefits (if applicable)
a. In cases where labour market demand is not the primary reason for this program, identify anticipated benefits from implementation of the proposed program to the wellbeing of communities in Alberta, particular those that your institutions serves:
•
Reviewer's Comment:

SECTION E: FINANCIAL VIABILITY AND SUSTAINABILITY

1. Budget and Funding Sources (Answer the following questions)
a. Describe how the institution plans to finance the program, (e.g. tuition, grants etc.):
•
b. Discuss risk mitigation plans should full revenue(s) not be achieved or should costs exceed amounts budgeted.
•
Reviewer's Comment:

2. Tuition and Student Cost Considerations (Answer the following questions)
a. Document tuition and fee projections for students (specify domestic student tuition fees, international student tuition fees, compulsory student fees, and other costs likely to be incurred by students (texts, equipment etc.). Provide rationale where appropriate such as comparisons with similar programs. (Consult with the Ministry as needed.):
•
b. Does the proposed program align with the Tuition and Fees Regulation? <input type="checkbox"/> Yes; or <input type="checkbox"/> No
c. Please elaborate on above answer, if necessary.
•
Reviewer's Comment:

SECTION F: INSTITUTIONAL IMPACT

1. Institutional Capacity (Answer the following questions)

a. Briefly describe how the proposed program aligns with the institution's mandate and government priorities. •
b. To what extent does the program build on the institution's existing programs, infrastructure, resources and experience from offering programs in related fields? •
Reviewer's Comment:
2. Internal Review and Approval
a. Indicate which internal governance body recommended approval and specify date of approval. •
Reviewer's Comment:

SECTION G: SYSTEM IMPACT

1. Program/Specialization Duplication (Answer the following questions)
a. Does the proposed program/specialization potentially duplicate existing programming in the Alberta Adult Learning System? <input type="checkbox"/> Yes; or <input type="checkbox"/> No
b. If yes, list these programs. •
c. If proposed program/specialization potentially constitutes program duplication, explain why such duplication is appropriate and beneficial in this circumstance. •
Reviewer's Comment:

SECTION H: OTHER CONSIDERATIONS

Other considerations
a. Are there other factors or considerations the Ministry should take into account when reviewing this proposal? •
Reviewer's Comment:

RECOMMENDATION (FOR DEPARTMENT USE)
Recommendation(s):
Rationale for Recommendation:
Reviewer(s):
Date Completed:

APPENDIX A: Program of Study - Courses and Credit Values

Calendar Description of Program

Astrophysics looks at the physics behind cosmological objects and their interactions. It is designed to give students a fundamental understanding of the core areas of physics as well as knowledge of the specialized area of astrophysics. To achieve this it includes a number of mathematics courses required to develop the mathematical skills required to both describe and understand physics and astrophysics. It also has some flexibility in that it contains a fair number of option courses, which makes it appealing to students with interests beyond physics and astrophysics.

Program of Study

EXAMPLE - MAJOR IN ASTROPHYSICS

Year	Course Number	Course Name, Description, & Prerequisites	Credits
1st	MATH 102	Applied Linear Algebra Vectors and matrices, solution of linear equations, equations of lines and planes, determinants, matrix algebra, orthogonality and applications (Gram-Schmidt), eigenvalues and eigenvectors and applications, complex numbers. Prerequisite or corequisite: MATH 100 or MATH 144.	3
	MATH 144	Calculus for the Physical Sciences I The derivative as a rate of change. Differentiation of elementary, trigonometric, exponential, and logarithmic functions. The definite integral as a summation. Integration. The Fundamental Theorem of Calculus. Taylor polynomials. Applications in the context of the physical sciences. Prerequisite: Mathematics 30-1.	3
	MATH 146	Calculus for the Physical Sciences II Techniques and applications of integration. Improper integrals. Introduction to differential equations. Partial differentiation. Applications in the context of the physical sciences. Prerequisite: One of MATH 100, 113, 114, 117, 134, 144 or 154.	3
	PHYS 144	Newtonian Mechanics A calculus-based course for students majoring in the physical sciences. Newtonian mechanics, including kinematics, dynamics, conservation of momentum and energy, rotational motion and angular momentum; special relativistic kinematics and dynamics, including length contraction, time dilation, and the conservation of energy and momentum in special relativity. Prerequisites: Mathematics 30-1 and Physics 30. Mathematics 31 is strongly recommended. Corequisites: MATH 117 or 144.	3
	PHYS 146	Relativity, Electricity and Magnetism A calculus-based course for students majoring in the physical sciences. Fluid statics and dynamics, elasticity and simple harmonic motion; sound waves, wave properties of light; quantum waves, wave-particle duality. Prerequisite: PHYS 124 (see Note following) or 144. Corequisite: MATH 118 or 146.	3
	Communication/ Writing Requirement	Chosen from ENGL or WRS at the 100 level or higher	6
	Breadth from Outside the Faculty of Science	Chosen from Breadth from Outside the Faculty of Science Course Lists	3
	Science Option	Any Faculty of Science course	3
	Open Option	Any course from any Faculty	3
TOTAL CREDITS			30

2nd	MA PH 251	Differential Equations for Physics Differential equations occur throughout undergraduate physics and being able to solve them is a critical mathematical skill for all physicists. The first part of the course emphasizes solution techniques to linear, second order ordinary differential equations, including series solutions and an introduction to trigonometric Fourier series via inhomogeneous equations. Nonlinear and systems of ordinary differential equations will also be discussed. The second part of the course introduces partial differential equations with a focus on the three classical linear second order partial differential equations of mathematical physics: the heat equation, the wave equation and Laplace's equation, and techniques for solving them including separation of variables, Fourier series and the d'Alembert solution of the wave equation. Examples from physics will be emphasized throughout. Prerequisite: MATH 146 or equivalent. Corequisite: MATH 214 or equivalent, and one of MATH 102 or 125 or 127. Note: Credit may be obtained for only one of MA PH 251, MATH 201, MATH 334 or MATH 336.	3
	MATH 214	Intermediate Calculus I Sequences and series, convergence tests, and Taylor series. Curves, tangent vectors, and arc length. Applications of partial differentiation. Polar, cylindrical, and spherical coordinates. Multiple integration. Prerequisite: One of MATH 101, 115, 136, 146 or 156. One of MATH 102, 125 or 127 recommended.	3
	PHYS 234 or PHYS 295	Introductory Computational Physics Algorithms for scientific data analysis: sorting methods, polynomial fitting, regression, interpolation, and Fourier analysis; techniques for solving physics and geophysics problems with selected topics from mechanics, waves, geometrical optics and ray tracing, electricity and magnetism, statistical physics, decay processes, quantum physics, signal processing. Prerequisites: one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130; and MATH 100 or 113 or 114 or 117 or 144, and MATH 102 or 125 or 127. Experimental Physics I Contemporary methods of experimental physics with measurements from classical and modern physics. Analysis and graphing of experimental data using programming techniques. Estimation and statistical treatment of experimental uncertainties consistent with standard practice in physics. Planning and record keeping for experimental work, written presentation of laboratory results. Prerequisites: MATH 101 or 115 or 118 or 146, one of PHYS 124, PHYS 144, or EN PH 131; and one of PHYS 126, PHYS 146, or PHYS 130.	3
	PHYS 244	Classical Mechanics Particle dynamics; oscillating systems and normal modes; conservative forces and energy; introduction to Lagrangian and Hamiltonian dynamics; central forces; orbital motion and scattering. Prerequisite: one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130. Corequisite: MATH 120 or 125 or 127 or 102 or equivalent, and MATH 209 or 215 or 317 or equivalent.	3
	PHYS 271	Introduction to Modern Physics Experimental evidence for limitations of classical physics; review of special relativity: quantization of charge, light, and energy; blackbody radiation, photoelectric effect, Compton effect; models of the atom; wavelike properties of particles; the uncertainty principle, the Schrodinger Equation, the infinite and finite square well, the harmonic oscillator, tunneling; the hydrogen atom, orbital angular momentum and electron spin; spin and statistics; selected topics. Prerequisite: one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130. Pre- or Corequisite: MATH 209 or 215 or 317 or equivalent.	3
	Breadth from Outside the Faculty of Science	Chosen from Breadth from Outside the Faculty of Science Lists	3
	Science Options	Any Faculty of Science course	3
	Open Options	Any course from any Faculty	9
	TOTAL CREDITS		

3rd	ASTRO 320	Stellar Astrophysics I Application of physics to stellar formation and stellar evolution; theoretical models and observational comparisons of main sequence stars, white dwarf stars, neutron stars, supernovae, black holes; binary star systems, stellar atmospheres and stellar spectra. Prerequisites: MATH 115, 118, 136, 146 or 156, and one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130. Pre or corequisite: any 200-level PHYS course. Some additional knowledge of astronomy (ASTRO 120 and/or 122) is advantageous.	3
	ASTRO 322	Galactic and Extragalactic Astrophysics The interstellar medium and interstellar reddening; galactic structure; kinematics and dynamics of stars in galaxies; quasars; introduction of cosmology. Prerequisites: MATH 115, 118, 136, 146, or 156 and one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130, and PHYS 208 or 271. Previous knowledge of astronomy is advantageous. ASTRO 320 is strongly recommended.	3
	MA PH 351	Mathematical Methods for Physics I This final core mathematics course for physics programs covers Fourier Analysis, Vector Calculus and Complex Analysis. The first part covers generalized Fourier series and orthogonal functions, and the Fourier integral. The second part covers the operators of vector differential calculus, line and surface integrals, and the three important vector integral theorems of Green, Gauss and Stokes, with a direct application to Gauss' and Ampere's laws of electromagnetism; spherical, cylindrical and planar symmetry. The final part of the course covers the basic calculus of functions of a complex variable: the Cauchy-Riemann equations, analytic functions, the Cauchy-Goursat theorem and Cauchy integral formula, Laurent series, poles and residues, contour integration. Examples from physics will be emphasized throughout. Prerequisite: MATH 214 and one of MATH 102 or 125 or 127 and one of MA PH 251 or MATH 201 or MATH 334 or MATH 336.	3
	PHYS 310 or PHYS 381	Thermodynamics and Kinetic Theory Temperature: heat, work, and the first law of thermodynamics; entropy and the second law, enthalpy, Helmholtz and Gibbs free energy; thermodynamic equilibrium criteria; Maxwell's relations, phase transitions; elementary kinetic theory of gases. Prerequisites: one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130. Pre- or corequisite: MATH 209 or 215 or 317 or equivalent.	3
		Electromagnetism I Review of scalar and vector fields; Gauss and Stokes theorems; curvilinear coordinates; Dirac delta function; electrostatic field and potential; electrostatic energy; conductors, capacitors; Laplace's equation; boundary value problems; methods of images; multipoles; electrostatic field in matter; polarization; displacement; linear dielectrics; magnetostatic field; Biot-Savart and Ampere's law; vector potential; magnetostatic field in matter; magnetization; linear and nonlinear magnetic media. Prerequisites: PHYS 230 or 281. Pre- or corequisite: MATH 334 or 201 or equivalent	
	Any of: MA PH 343 PHYS 310 PHYS 311	Classical Mechanics II Principles of mechanics; non-inertial frames; Lagrange's equations and Hamilton's principle; dynamics of oscillating systems; rigid body kinematics and dynamics; Hamiltonian methods and canonical transformations. Prerequisite: PHYS 244, MATH 215 or 317.	6
	Thermodynamics and Kinetic Theory Temperature: heat, work, and the first law of thermodynamics; entropy and the second law, enthalpy, Helmholtz and Gibbs free energy; thermodynamic equilibrium criteria; Maxwell's relations, phase transitions; elementary kinetic theory of gases. Prerequisites: one of PHYS 124, PHYS 144, or EN PH 131, and one of PHYS 126, PHYS 146, or PHYS 130. Pre- or corequisite: MATH 209 or 215 or 317 or equivalent.		
	Statistical Physics		

	PHYS 362	Quantum states, probability distributions, temperature and entropy; canonical ensemble and the partition function; ideal gases, paramagnets; blackbody radiation. Debye model for phonons; quantum statistics; Fermi-Dirac distribution and electrons in metals; Bose-Einstein distribution. Prerequisites: PHYS 310 (or CH E 243 for Engineering Physics Program students), PHYS 271 and MATH 209 or 215 or 317 or equivalent.	
	PHYS 372	Optical Physics Gaussian optics; optical instruments; matrix analysis of lens systems; aberrations; polarization; double- and multiple-beam interference; Fraunhofer and Fresnel diffraction; introduction to laser physics and applications; selected topics from contemporary optics. Prerequisite: PHYS 230 or 281, and MATH 209 or 215 or 317.	
	PHYS 381	Quantum Mechanics I Origins of quantum mechanics; wave functions; Schrodinger equation and its application to one dimensional systems, postulates and physical interpretation of quantum mechanics; orbital angular momentum, central potentials and three-dimensional systems. Prerequisites: PHYS 271, PHYS 230 or 281, MATH 225 or 227 (or 102), MATH 334 or 201.	
		Electromagnetism I Review of scalar and vector fields; Gauss and Stokes theorems; curvilinear coordinates; Dirac delta function; electrostatic field and potential; electrostatic energy; conductors, capacitors; Laplace's equation; boundary value problems; methods of images; multipoles; electrostatic field in matter; polarization; displacement; linear dielectrics; magnetostatic field; Biot-Savart and Ampere's law; vector potential; magnetostatic field in matter; magnetization; linear and nonlinear magnetic media. Prerequisites: PHYS 230 or 281. Pre- or corequisite: MATH 334 or 201 or equivalent	
	Science Options	Any Faculty of Science course	3
	Open Options	Any course from any Faculty	9
TOTAL CREDITS			30
4th	ASTRO 429 or ASTRO 465	Upper Atmosphere and Space Physics Basic space plasma phenomena: the Earth's plasma and field environment; the solar cycle; generation of the solar wind; the interplanetary plasma and field environment; the solar-terrestrial interaction; magnetospheric substorms; the aurora borealis; magnetosphere-ionosphere interactions; effects of magnetospheric storms on man-made systems; use of natural electromagnetic fields for geophysical exploration. Pre- or corequisite: PHYS 381.	3
	ASTRO 4XX or any of: PHYS 420	Stellar Astrophysics II Stellar interiors and nuclear transformations; energy transport; model stars; variable stars; stellar evolution. Prerequisites: PHYS 310, 271, ASTRO 320, MATH 334. Note: Credit may be obtained for only one of ASTRO 465 or ASTRO 565.	
	PHYS 458	Chosen from ASTRO at the 400 level Computational Physics Basic principles; computational methods selected from finite-differences, matrix manipulation, variational techniques, discrete transforms, stochastic methods, lattice techniques; as applied to topics selected from nonlinear mechanics, chaotic systems; electrodynamics; wave propagation; statistical physics; quantum mechanics; condensed matter. Prerequisites: PHYS 234, 244, PHYS 381, MATH 337 or ECE 341 or equivalent. Recommended pre- or corequisites: MA PH 343, PHYS 311, PHYS 372, PHYS 472, and PHYS 481. Familiarity with a programming language strongly recommended. Special and General Relativity Special Relativity: space-time; Lorentz transformations; definitions of scalars, vectors and tensors; motion of a relativistic particle; energymomentum tensor and	3

	PHYS 467	equations of motion; transformation of electromagnetic fields. General Relativity: geometry of curved space-time; equivalence principle; gravity as curvature; Einstein equations; black hole and cosmological solutions; gravitational waves. Prerequisites: MATH 337 or ECE 341, PHYS 244. Corequisite: PHYS 481.	
	PHYS 472	Fundamentals of Continuum Mechanics Cartesian tensors; stress; strain and deformation; Eulerian and Lagrangian descriptions of motions; conservation principles, Cauchy's equation of motion; constitutive relations, elasticity, plasticity, linear and nonlinear viscous fluid flow; elastic wave equation and Navier-Stokes equation; similarity, scaling and nondimensionalisation of governing equations. Applications from geophysics, materials science, oceanography, and atmospheric physics. Pre- or corequisites: MATH 337 or ECE 341, PHYS 381.	
	PHYS 481	Quantum Mechanics II Review of the postulates of quantum mechanics; quantization of angular momentum; matrix representations, spin and parity; approximation methods; perturbation theory; variational and other methods; applications; scattering theory; systems of identical particles. Prerequisites: PHYS 372, and MATH 337 or ECE 341 or equivalent, and MATH 311 or 411.	
	PHYS 485	Electromagnetism II Electromotive force; Faraday's law; inductance; Maxwell's equations in free space and in matter; electromagnetic potentials; gauges; energy and momentum conservation laws; plane waves in vacuum, in nonconducting and in conducting media; reflection and refraction of electromagnetic waves; dispersion, wave guides; dipole radiation; radiation due to moving charge; radiation reaction. Prerequisite: PHYS 381, MATH 337 or ECE 341 or equivalent.	
		Introductory Particle Physics Particles and forces; relativistic kinematics; symmetries and conservation laws; bound states, heavy flavours, and the quark model; Dirac equation and the electrodynamics of leptons; electrodynamics of quarks and the parton model; quantum chromodynamics and the strong interactions; weak interactions and electroweak unification. Prerequisites: PHYS 372; MATH 225 or 227, MATH 337 or equivalent. Recommended: PHYS 458 and PHYS 472.	
Science Options	Any Faculty of Science course (with at least 6 units at the 300 level or higher)	9	
Open Options	Any course from any Faculty (with at least 6 units at the 300 level or higher)	15	
TOTAL CREDITS			30

Program Location

All courses associated with Astrophysics are offered on the main (North) University of Alberta campus.

Delivery Mode

All courses associated with Astrophysics use a face-to-face delivery mode.

Program Learning Outcomes

Students graduating from the Major in Astrophysics should be able to:

1. Demonstrate knowledge of classical mechanics, electromagnetism, special relativity, thermal physics and quantum mechanics and be able to apply one or more of these fields to explain and predict the behaviour of physical systems.
2. Demonstrate knowledge in specialized areas of astrophysics.
3. Devise and conduct experiments to test a theoretical hypothesis and then analyze the data collected to reach a conclusion on its validity.
4. Demonstrate proficiency in the mathematical techniques required to accurately describe and understand physics.
5. Use computer programs to analyze and plot experimental data; solve equations numerically and simulate physical processes.
6. Communicate concepts in astrophysics with both written documents and presentations.
7. Develop critical thinking and the ability to work independently and collaboratively.

APPENDIX B: Program of Study - Calendar Language

Major in Astrophysics (54 units)

Foundation Courses

- MATH 102 - Applied Linear Algebra
- MATH 144 - Calculus for the Physical Sciences I
- MATH 146 - Calculus for the Physical Sciences II
- PHYS 144 - Newtonian Mechanics
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- ASTRO 320 - Stellar Astrophysics I
- ASTRO 322 - Galactic and Extragalactic Astrophysics
- MA PH 251 - Differential Equations for Physics
- MA PH 351 - Mathematical Methods for Physics I
- MATH 214 - Intermediate Calculus I
- PHYS 244 - Classical Mechanics
- PHYS 271 - Introduction to Modern Physics

3 units from

- PHYS 234 - Introductory Computational Physics
- PHYS 295 - Experimental Physics I

3 units from

- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 381 - Electromagnetism I

6 units from

- MA PH 343 - Classical Mechanics II
- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 311 - Statistical Physics
- PHYS 362 - Optical Physics
- PHYS 372 - Quantum Mechanics I
- PHYS 381 - Electromagnetism I

3 units from

- ASTRO 429 - Upper Atmosphere and Space Physics
- ASTRO 465 - Stellar Astrophysics II

3 units from

- any 400-level ASTRO course
- PHYS 420 - Computational Physics
- PHYS 458 - Special and General Relativity
- PHYS 467 - Fundamentals of Continuum Mechanics
- PHYS 472 - Quantum Mechanics II
- PHYS 481 - Electromagnetism II

Notes

1. Note that some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
2. ASTRO 120 and ASTRO 122 are recommended as Science options.
3. Not all 200-, 300-, and 400-level Physics courses are offered every year so students should plan accordingly.
4. Students without a background in computer programming are strongly encouraged to take CMPUT 174 as one of their Science options in their first year.

Proposal Template: New Bachelor's Degree Programs and Specializations (Part A: System Co-ordination Review)

Complete this template for proposals for new bachelor's degree programs or specializations. Institutions should:

- ensure that submission content is concise. Any additional information may be appended;
- indicate “not applicable” when questions are not relevant to a particular proposal; and
- ensure that applicable supporting documents are attached to the proposal.

SECTION A: PROPOSAL OVERVIEW

Basic Information *(Complete the table below)*

Institution	University of Alberta
Program Name	Bachelor of Science
Specialization Name	Environmental Earth Sciences
Credential Awarded	Bachelor of Science
Proposed Effective Date	July 1, 2024

Type of Initiative *(Answer the following questions)*

This is a proposal for (select one from the drop-down menu):

New specialization(s) (majors) in an existing bachelor's degree program

As authorized by the Ministry per correspondence with the Provost, this is an administrative update which is being submitted in order to bring the program record up to date. Enrolments in Environmental Earth Sciences were previously counted under the Earth Sciences specialization.

As requested by the Ministry, a copy of the program of study (courses and credit values) are included in Appendices A and B.

SECTION B: OVERVIEW OF PROPOSED PROGRAM OF STUDY

1. Program Description *(Answer the following questions)*

- a. Attach (as an appendix to this proposal) a concise program description document that includes:
- 3-4 sentence calendar description of the program,
 - a proposed program of study including course names, descriptions, credits and prerequisites, by semester or year of study,
 - program location (i.e., campus locations and/or off-site locations), and delivery mode (i.e., face-to-face, online, or blended), and
 - program learning outcomes.

<p>b. Where applicable, identify planned collaborations with other post-secondary institutions, departments within the institution or other organizations that this program respectively facilitates or provides for.</p> <ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:
2. Work Integrated Learning (If applicable, answer the following questions)
<p>a. Identify the number of placements required in the program (including type of work setting and duration/timing of activities).</p> <ul style="list-style-type: none"> • Not applicable -- Environmental Earth Sciences students are eligible to participate in the Science Internship Program (SIP), in which 4-, 6-, 8- and 12-months internships are available at a variety of work settings.
<p>b. Summarize communications with employers (append applicable letters of support, minutes of program advisory committee meetings, etc.) showing that sufficient placements will be available when needed.</p> <ul style="list-style-type: none"> • Not applicable
<p>c. Comment on whether/how work integrated learning placements in other programs (at the institution or at other institutions within the Alberta Adult Learning System) may be impacted as a result of this program.</p> <ul style="list-style-type: none"> • Not applicable
3. Endorsement of and/or Support for Program (If applicable)
<p>a. Describe endorsement(s) from relevant professional organizations, regulatory bodies, advisory committees, employers, and/or industry.</p> <ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:

SECTION C: ENROLMENT PLANNING

1. (a) Projected Student Enrolment (Complete the table below as applicable).

Proposed Enrolment	1 st Year of Implementation	2 nd Year of Implementation	3 rd Year of Implementation	4 th Year of Implementation	Annual Ongoing
Total Headcount	0	0	0	0	0
• 1 st Year of Study	0	0	0	0	0
• 2 nd Year of Study	0	0	0	0	0
• 3 rd Year of Study	0	0	0	0	0
• 4 th Year of Study	0	0	0	0	0
Anticipated No. of Graduates	0	0	0	0	0
Reviewer's Comment:					

2. Learner Pathways

- a. To what extent will learners be able to transfer credits to and from other post-secondary institutions?
 -
- b. What types of further studies, if not within the same field, would graduates be most likely to pursue?
 -

Reviewer's Comment:

3. Societal and Community Benefits *(if applicable)*

- a. In cases where labour market demand is not the primary reason for this program, identify anticipated benefits from implementation of the proposed program to the wellbeing of communities in Alberta, particular those that your institutions serves:
 -

Reviewer's Comment:

SECTION E: FINANCIAL VIABILITY AND SUSTAINABILITY

1. Budget and Funding Sources *(Answer the following questions)*

- a. Describe how the institution plans to finance the program, (e.g. tuition, grants etc.):
 -
- b. Discuss risk mitigation plans should full revenue(s) not be achieved or should costs exceed amounts budgeted.
 -

Reviewer's Comment:

2. Tuition and Student Cost Considerations *(Answer the following questions)*

- a. Document tuition and fee projections for students (specify domestic student tuition fees, international student tuition fees, compulsory student fees, and other costs likely to be incurred by students (texts, equipment etc.). Provide rationale where appropriate such as comparisons with similar programs. (Consult with the Ministry as needed.):
 -
- b. Does the proposed program align with the Tuition and Fees Regulation? Yes; or No
- c. Please elaborate on above answer, if necessary.
 -

Reviewer's Comment:

SECTION F: INSTITUTIONAL IMPACT

1. Institutional Capacity *(Answer the following questions)*

- a. Briefly describe how the proposed program aligns with the institution's mandate and government priorities.
 -

b. To what extent does the program build on the institution's existing programs, infrastructure, resources and experience from offering programs in related fields?

•

Reviewer's Comment:

2. Internal Review and Approval

a. Indicate which internal governance body recommended approval and specify date of approval.

•

Reviewer's Comment:

SECTION G: SYSTEM IMPACT

1. Program/Specialization Duplication *(Answer the following questions)*

a. Does the proposed program/specialization potentially duplicate existing programming in the Alberta Adult Learning System? Yes; or No

b. If yes, list these programs.

•

c. If proposed program/specialization potentially constitutes program duplication, explain why such duplication is appropriate and beneficial in this circumstance.

•

Reviewer's Comment:

SECTION H: OTHER CONSIDERATIONS

Other considerations

a. Are there other factors or considerations the Ministry should take into account when reviewing this proposal?

•

Reviewer's Comment:

RECOMMENDATION (FOR DEPARTMENT USE)

Recommendation(s):

Rationale for Recommendation:

Reviewer(s):

Date Completed:

APPENDIX A: Program of Study - Courses and Credit Values

Calendar Description of Program

The Environmental Earth Sciences program examines the interactions between the physical, biological, and human components of the Earth to understand our local and global environments and provide solutions to environmental problems. It is designed to give students a fundamental understanding of geology as well as the specialized area of environmental earth sciences. To achieve this it includes a number of core geology courses, which allow graduates of the Environmental Earth Sciences program to meet the APEGA requirements for registration as professional geoscientists. It also has some flexibility in that it contains a fair number of option courses, which allow students to explore topics in oceanography, atmospheric sciences, Earth surface processes, biogeography, geochemistry, and geophysics. This program also allows students to develop expertise in environmental instrumentation, applications and management, geographic information systems (GIS), digital remote sensing, and field techniques.

Program of Study

EXAMPLE: MAJOR IN ENVIRONMENTAL EARTH SCIENCES

Year	Course Number	Course Name, Description, & Prerequisites	Credits
1st	BIOL 108	Introduction to Biological Diversity Examines the major lineages of life on Earth. Overview of evolutionary principles and classification, the history of life, and the key adaptations of prokaryotes, protists, fungi, plants, and animals. Laboratories survey the diversity of biological form and function, and introduce students to data collection and scientific writing. Prerequisite: Biology 30.	3
	CHEM 101	Introductory University Chemistry I Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent.	3
	CHEM 102	Introductory University Chemistry II Rates of reactions, thermodynamics and equilibrium, electro-chemistry, modern applications of chemistry. Prerequisite: CHEM 101.	3
	EAS 100	Planet Earth Introduction to the origin and evolution of the Earth and the solar system. Introduction to plate tectonics and the rock cycle. Simple energy balances and interactions between radiation and the atmosphere, land, oceans, ice masses, and the global hydrological cycle. Evolution of life, biogeography, and global climate in the context of geologic time. The carbon cycle. Human interaction with the Earth. Mineral & energy resources.	3
	EAS 105	The Dynamic Earth Through Time The plate tectonic framework of a dynamic Earth as it relates to the origin of major groups of minerals and rocks. Earthquakes, structural geology, and the origin of mountain belts. Surface processes and their sedimentary products. History of life and extinctions. Prerequisite: EAS 100 or GEOPH 110 or GEOPH 210.	3
	MATH 117 or MATH 144	Honors Calculus I Functions, continuity, and the derivative. Applications of the derivative. Extended limits and L'Hospital's rule. Prerequisites: Mathematics 30-1 and Mathematics 31, or consent of the Department. Notes: (1) This course is designed for students with at least 80 percent in Pure Mathematics 30 or Mathematics 30-1 and Mathematics 31. (2) Credit can be obtained in at most one of MATH 100, 113, 114, 117, 134, 144, 154 or SCI 100. Calculus for the Physical Sciences I The derivative as a rate of change. Differentiation of elementary, trigonometric, exponential, and logarithmic functions. The definite integral as a summation.	3

		Integration. The Fundamental Theorem of Calculus. Taylor polynomials. Applications in the context of the physical sciences. Prerequisite: Mathematics 30-1. Note: Credit can be obtained in at most one MATH 100, 113, 114, 117, 134, 144, 154 or SCI 100.	
	MATH 118 or MATH 146	Honors Calculus II Integration and the Fundamental Theorem. Techniques and applications of integration. Derivatives and integrals of the exponential, and trigonometric functions. Introduction to infinite series. Introduction to partial derivatives. Prerequisite: MATH 117. (Students with a 100-level calculus course different from MATH 117 may be admitted with consent of the Department.) Notes: (1) Credit can be obtained in at most one MATH 101, 115, 118, 136, 146, 156 or SCI 100.	3
	STAT 151	Introduction to Applied Statistics I Data collection and presentation, descriptive statistics. Probability distributions, sampling distributions and the central limit theorem. Point estimation and hypothesis testing. Correlation and regression analysis. Goodness of fit and contingency table. Prerequisite: Mathematics 30-1 or 30-2.	3
	Communication/ Writing Requirement	Chosen from ENGL or WRS at the 100 level or higher	6
TOTAL CREDITS			30
2nd	BIOL 208	Principles of Ecology Ecology is the scientific study of interactions between organisms and their environment in a hierarchy of levels of organization: individuals, populations, communities, and ecosystems. Provides a comprehensive survey of general concepts that can stand alone or serve as preparation for advanced courses in ecology. Labs emphasize collection, analysis, and interpretation of data from ecological experiments and field studies to illustrate and complement lecture material. Examples are drawn from a broad range of organisms and systems. Prerequisite: BIOL 108 or SCI 100.	3
	EAS 221	Introduction to Geographical Information Systems and Remote Sensing Background to the principles of Geographic Information Systems and Remote Sensing. Lectures emphasize the theoretical and methodological underpinnings, labs impart the technical aspects through hands-on experience with appropriate software. Prerequisite: Any 100-level Science course.	3
	EAS 222	Stratigraphy and Sedimentation Origin of sedimentary materials; sedimentary processes; sedimentary structures, textures, and flow regimes; properties and classification of clastic and non-clastic rocks; sedimentary environments and facies in non-marine, coastal and marine settings; principles of stratigraphy, stratigraphic nomenclature and the stratigraphic column. Prerequisite: One of EAS 101, 103, 105 or 210.	3
	EAS 224	Mineralogy I Principles of crystallography, physical and chemical properties of minerals, determinative mineralogy. Prerequisite: EAS 101, 105, 210 or SCI 100.	3
	EAS 225	Earth Surface Processes and Landforms Geomorphological processes and landform analysis with special reference to the landscape of Alberta. Fieldwork required. Prerequisite: One of EAS 100, 101, 102, 201, 210 or SCI 100.	3
	EAS 233	Geologic Structures Orientation, measurement description, and analysis of planar and linear structures in rocks, including folds, faults, and fabrics. Introduction to mapping and the collection of structural information. Construction of geologic maps and cross-sections. Introduction to stereographic and equal-area projections. Basic concepts of strain and stress in rock deformation. Prerequisite: EAS 105, 210 or SCI 100.	3

	EAS 234	Geology Field School Geological field studies with emphasis on properties of sedimentary rocks, paleontology, stratigraphy, Quaternary geology, structural mapping, and Cordilleran tectonics. Field exercises teach the fundamentals of recording field data, reconstructing depositional environments, and tectonic interpretation. This field school takes place immediately following the Winter examination period. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Enrolment is restricted to honours and specialization students in Geology, Environmental Earth Sciences and Paleontology. Prerequisites: EAS 233, and one of EAS 222, 235 or 236.	3
	EAS 250	Biogeography The factors controlling global distribution of plants and animals will be covered from ecological and historical perspectives. Techniques for the analysis of biogeographic patterns, including paleoecology, remote sensing, and phylogenetics. Ecosystem responses to global change, including species migration, disturbance ecology, and invasions. May require field trips. If so, will require payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Prerequisite: EAS 100, BIOL 108 or SCI 100.	3
	PHYS 124 or PHYS 144	Particles and Waves Algebra-based course primarily for students in life, environmental, and medical sciences. It guides the student through two distinct types of motion: motion of matter (particles) and wave motion. Vectors, forces, bodies in equilibrium, review of kinematics and basic dynamics; conservation of momentum and energy; circular motion; vibrations; elastic waves in matter; sound; wave optics; black body radiation, photons, de Broglie waves. Examples relevant in environmental, life, and medical sciences will be emphasized. Prerequisites: Physics 20 or equivalent, Mathematics 30-1. Physics 30 is strongly recommended.	3
	PHYS 144	Newtonian Mechanics and Relativity A calculus-based course for students majoring in the physical sciences. Newtonian mechanics, including kinematics, dynamics, conservation of momentum and energy, rotational motion and angular momentum; special relativistic kinematics and dynamics, including length contraction, time dilation, and the conservation of energy and momentum in special relativity. Prerequisites: Mathematics 30-1 and Physics 30. Mathematics 31 is strongly recommended. Corequisites: MATH 117 or 144.	
	PHYS 126 or PHYS 146	Fluids, Fields, and Radiation A continuation of PHYS 124 primarily for students in life, environmental, and medical science. Fluid statics and dynamics, gases, kinetic interpretation; electrostatics; currents and circuits; magnetic field; electromagnetic induction; nuclear radiation, its interaction with matter and applications. Prerequisite: PHYS 124 or PHYS 144.	3
	PHYS 146	Fluids and Waves A calculus-based course for students majoring in the physical sciences. Fluid statics and dynamics, elasticity and simple harmonic motion; sound waves, wave properties of light; quantum waves, wave-particle duality. Prerequisite: PHYS 124 (see Note following) or 144. Corequisite: MATH 118 or 146.	
TOTAL CREDITS			30
3rd	EAS 212 or EAS 270	The Oceans An introduction to the physics and chemistry of the oceans. Topics covered include ocean currents, the ocean floor, origins and buffering of the chemistry of the oceans. The role of the oceans in determining past and present climates is introduced. Prerequisite: Any 100-level Science course.	3
	EAS 270	The Atmosphere An introduction to weather. Atmospheric composition, vertical structure and energetics. Humidity and clouds, stratification and instability. Atmospheric motion on the global and synoptic scales. Air masses, fronts and storms. Introduction to weather maps, weather analysis and numerical weather prediction models. Weather map discussions. Prerequisite: Any 100-level Mathematics or Physics course, or SCI 100.	
	EAS 320	Geochemistry I A survey of chemical processes occurring in geological settings with emphasis on the principles governing the migration and distribution of the elements and isotopes in the	3

		earth. Thermodynamics applied to aqueous systems. Introduction to organic geochemistry and global geochemical cycles. Prerequisite: CHEM 101 and CHEM 102 and EAS 224.	
	EAS 323	Introduction to Hydrogeology The hydrologic cycle, water budgets and basic hydrologic processes; physical properties of porous media and groundwater flow principles; steady-state groundwater flow; transient groundwater flow, well hydraulics and groundwater resource evaluation; regional groundwater flow; and, basic hydrochemistry and transport processes. Prerequisites: One of EAS 100, 101, 102, 201 or 210 and MATH 113 or 114, PHYS 124 or 144, and one of PHYS 126, 130, or 146.	3
	EAS 324	Quaternary Geoscience and Terrain Analysis Quaternary geoscience and applied geomorphology, including dating methods, stratigraphy and paleoclimates. Fundamentals of interpretation and mapping of surficial geology and geomorphology from aerial photographs and satellite images with a focus on western Canada. Some field work may be required. Prerequisites: EAS 221 & 225.	3
	GEOPH 223	Environmental Geophysics Near surface geophysical imaging techniques with focus on applications in hydrogeology, glaciology and environmental studies; rock properties; imaging methods covered include: shallow seismic exploration, magnetic exploration, radiometric techniques, electrical resistivity tomography (ERT); electromagnetic (EM) methods; ground penetrating radar (GPR), application to environmental monitoring, climate change, environmental legislation. Prerequisites: one of MATH 101, 115, 118, 146; one of PHYS 124, PHYS 144, or EN PH 131; one of PHYS 126, PHYS 146, or PHYS 130.	3
	HGEO 250	Sustainable Development and Environmental Management An introduction to sustainable development approaches to dealing with environmental issues. Prerequisite: Any *3 course.	3
	Breadth from Outside the Faculty of Science	Chosen from Breadth from Outside the Faculty of Science Course Lists	3
	Open Options	Any course from any Faculty (with at least 6 units at the 300 level or higher)	9
TOTAL CREDITS			30
4th	EAS 327 or EAS 351 or EAS 451	Environmental Instrumentation Laboratory work and lectures to develop skills in environmental measurement through comprehension of first principles. Instrumentation (basic electronics; matching signal sources and receivers; noise; frequency response). Sensor-environment coupling (heat and mass transfer). Sampling theory. Principles will be applied to selected environmental monitoring instruments. Field trip. Prerequisites: EAS 100 or 102 and MATH 113 or 114. Environmental Applications of Geographical Information Systems This course emphasizes the applications of Geographic Information Systems (GIS) to the environmental sciences. Examples from resource management and the earth and biological sciences are discussed. Labs impart technical experience with ARGINFO. Prerequisites: EAS 221 and one of MATH 113, 114, STAT 141, 151, SCI 151, or permission of the instructor. Digital Remote Sensing This course introduces the interactions of electromagnetic radiation with terrestrial materials (rocks, soils, water, snow). These notions are fundamental for the interpretation of optical, thermal, and radar remote sensing imagery. Labs focus on image processing with emphasis on radiometric and geometric enhancements and image classification. The course covers existing and upcoming sensors and applications of the data to earth sciences including geologic and land use mapping and resource exploration. Prerequisite: EAS 221.	3
	EAS 354	Environmental Earth Science Field School Introduction to fieldwork in geomorphology, biogeography and microclimatology. Elementary field mapping, the use of electronic field instrumentation for hydrological,	3

		water quality and micro-climatological monitoring, mapping and analysis of vegetation patterns, and techniques for the field description and laboratory analysis of soils and sediments. Introductory lectures and ten days of fieldwork. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Prerequisites: EAS 225, 250 and either 270 or 327, or consent of Instructor.	
EAS 425 or EAS 468	<p>Contaminant Hydrogeology An introduction to the principles of groundwater chemistry, the chemical evolution of natural groundwater flow systems, sources of contamination, and mass transport processes. Hydrogeologic aspects of waste disposal and groundwater remediation. Prerequisite: EAS 323.</p> <p>Geochemical Processes Application of geochemistry to Earth materials and geological settings. Topics vary: see www.eas.ualberta.ca/eas468 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Geochemistry of Ore Deposits; (2) Environmental Geochemistry (Not available to students with credit in EAS 420). Prerequisite: EAS 320 or consent of instructor.</p>		3
EAS 457	<p>Global Change Major processes of change in the contemporary environment, their history and their interrelationships (climate and sea level change, changes in atmospheric composition, deforestation, desertification, water resource depletion, soil erosion, atmospheric and aquatic pollution); global biogeochemical cycles and their role in environmental change. Prerequisite: One of EAS 208, 225 or 250.</p>		3
EAS 458	<p>Cold Regions Geoscience Environments and environmental change associated with high latitude and high elevation regions. Topics vary: see www.eas.ualberta.ca/eas458 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Arctic environments; (2) Alpine environments; (3) Antarctica. Prerequisite: EAS 225 or 250 or consent of the instructor.</p>		3
Open Options	Any course from any Faculty (with at least 6 units at the 300 level or higher)		15
TOTAL CREDITS			30

Program Location

All courses associated with Environmental Earth Sciences are offered on the main (North) University of Alberta campus.

Delivery Mode

All courses associated with Environmental Earth Sciences use a face-to-face delivery mode.

Program Learning Outcomes

Students graduating from the Major in Environmental Earth Sciences should be able to:

1. Demonstrate fundamental knowledge of biology, chemistry, physics, mathematics, and statistics.
2. Demonstrate knowledge of fundamental geoscience topics such as mineralogy, sedimentology, stratigraphy, geomorphology, structural geology, geochemistry, geophysics, and field techniques.
3. Demonstrate knowledge of the interactions between the physical, biological, and human components of the Earth to understand local and global environments.
4. Through the practice of multidisciplinary environmental geoscience, perform field research and sampling strategies, conduct laboratory analyses of water and other surface materials, and use spatial tools like remote sensing to interpret satellite data/imagery and Geographic Information Systems (GIS) to create models.
5. Provide solutions to environmental problems that involve interactions between the solid Earth, surface processes, and environmental phenomena.
6. Communicate concepts in environmental earth sciences with both written documents and presentations.
7. Develop critical thinking and the ability to work independently and collaboratively.

APPENDIX B: Program of Study - Calendar Language

Major in Environmental Earth Sciences (87 units)

Foundation Courses

- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- EAS 100 - Planet Earth
- EAS 105 - The Dynamic Earth Through Time
- STAT 151 - Introduction to Applied Statistics I

3 units from

- MATH 117 - Honors Calculus I
- MATH 144 - Calculus for the Physical Sciences I

3 units from

- MATH 118 - Honors Calculus II
- MATH 146 - Calculus for the Physical Sciences II

3 units from

- PHYS 124 - Particles and Waves
- PHYS 144 - Newtonian Mechanics

3 units from

- PHYS 126 - Fluids, Fields, and Radiation
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- BIOL 208 - Principles of Ecology
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 222 - Stratigraphy and Sedimentation
- EAS 224 - Mineralogy I
- EAS 225 - Earth Surface Processes and Landforms
- EAS 233 - Geologic Structures
- EAS 234 - Geology Field School
- EAS 250 - Biogeography
- EAS 320 - Geochemistry I
- EAS 323 - Introduction to Hydrogeology
- EAS 324 - Quaternary Geoscience and Terrain Analysis

- EAS 354 - Environmental Earth Science Field School
- EAS 457 - Global Change
- EAS 458 - Cold Regions Geoscience (See Note 1)
- GEOPH 223 - Environmental Geophysics
- HGEO 250 - Sustainable Development and Environmental Management

3 units from

- EAS 212 - The Oceans
- EAS 270 - The Atmosphere

3 units from

- EAS 327 - Environmental Instrumentation
- EAS 351 - Environmental Applications of Geographical Information Systems
- EAS 451 - Digital Remote Sensing

3 units from

- EAS 425 - Contaminant Hydrogeology
- EAS 468 - Geochemical Processes

Notes

1. EAS 458 may be taken more than once for credit.
2. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Proposal Template: New Bachelor’s Degree Programs and Specializations (Part A: System Co-ordination Review)

Complete this template for proposals for new bachelor’s degree programs or specializations. Institutions should:

- ensure that submission content is concise. Any additional information may be appended;
- indicate “not applicable” when questions are not relevant to a particular proposal; and
- ensure that applicable supporting documents are attached to the proposal.

SECTION A: PROPOSAL OVERVIEW

Basic Information *(Complete the table below)*

Institution	University of Alberta
Program Name	Bachelor of Science
Specialization Name	Paleontology
Credential Awarded	Bachelor of Science
Proposed Effective Date	July 1, 2024

Type of Initiative *(Answer the following questions)*

This is a proposal for (select one from the drop-down menu):

New specialization(s) (majors) in an existing bachelor's degree program

As authorized by the Ministry per correspondence with the Provost, this is an administrative update which is being submitted in order to bring the program record up to date. Enrolments in Paleontology were previously counted under the Earth Sciences specialization.

As requested by the Ministry, a copy of the program of study (courses and credit values) are included in Appendices A and B.

SECTION B: OVERVIEW OF PROPOSED PROGRAM OF STUDY

1. Program Description <i>(Answer the following questions)</i>	
a.	Attach (as an appendix to this proposal) a concise program description document that includes: <ul style="list-style-type: none"> • 3-4 sentence calendar description of the program, • a proposed program of study including course names, descriptions, credits and prerequisites, by semester or year of study, • program location (i.e., campus locations and/or off-site locations), and delivery mode (i.e., face-to-face, online, or blended), and • program learning outcomes.
b.	Where applicable, identify planned collaborations with other post-secondary institutions, departments within the institution or other organizations that this program respectively facilitates or provides for.

<ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:
2. Work Integrated Learning (If applicable, answer the following questions)
<p>a. Identify the number of placements required in the program (including type of work setting and duration/timing of activities).</p> <ul style="list-style-type: none"> • Not applicable -- Environmental Earth Sciences students are eligible to participate in the Science Internship Program (SIP), in which 4-, 6-, 8- and 12-months internships are available at a variety of work settings.
<p>b. Summarize communications with employers (append applicable letters of support, minutes of program advisory committee meetings, etc.) showing that sufficient placements will be available when needed.</p> <ul style="list-style-type: none"> • Not applicable
<p>c. Comment on whether/how work integrated learning placements in other programs (at the institution or at other institutions within the Alberta Adult Learning System) may be impacted as a result of this program.</p> <ul style="list-style-type: none"> • Not applicable
3. Endorsement of and/or Support for Program (If applicable)
<p>a. Describe endorsement(s) from relevant professional organizations, regulatory bodies, advisory committees, employers, and/or industry.</p> <ul style="list-style-type: none"> • Not applicable
Reviewer's Comment:

SECTION C: ENROLMENT PLANNING

1. (a) Projected Student Enrolment (Complete the table below as applicable).

Proposed Enrolment	1 st Year of Implementation	2 nd Year of Implementation	3 rd Year of Implementation	4 th Year of Implementation	Annual Ongoing
Total Headcount	0	0	0	0	0
• 1 st Year of Study	0	0	0	0	0
• 2 nd Year of Study	0	0	0	0	0
• 3 rd Year of Study	0	0	0	0	0
• 4 th Year of Study	0	0	0	0	0
Anticipated No. of Graduates	0	0	0	0	0
Reviewer's Comment:					

<p>a. Indicate the percentage of international students in the enrolment projections and provide a brief rationale regarding how the percentage was established.</p> <ul style="list-style-type: none"> •
Reviewer's Comment:

2. Learner and Labour Market Demand (*Answer the following questions*)

- a. Provide evidence of labour market demand for graduates, detailing how such demand was forecasted and substantiated regionally and provincially. (Append supporting documentation, as appropriate.)
-
- b. Identify which stakeholder groups were consulted regarding demand/need for this program:
- | | |
|--|--|
| <input type="checkbox"/> Student/learners | <input type="checkbox"/> Employers and professional associations |
| <input type="checkbox"/> Faculty | <input type="checkbox"/> Community organizations |
| <input type="checkbox"/> Program advisory committee | <input type="checkbox"/> Other post-secondary institutions |
| <input type="checkbox"/> Regulator and/or accreditation bodies | <input type="checkbox"/> Other (please identify) |
- c. Briefly discuss the results of the identified consultations and attach supporting documentation (e.g., minutes of meetings, letters of support, etc.), when available.
-
- d. Provide evidence of learner demand for this program. How was this demand determined? (Append supporting evidence, as appropriate e.g., survey results, waitlists, demand in similar programs at other institutions etc.)
-
- e. Identify and discuss any additional factors that may impact learner demand for this proposed program.
-
- f. Briefly describe how the enrolment plan aligns with the anticipated demand for this program, taking into account the identified labour market demand and other Alberta program providers.
-
- g. Comment on the overall sustainability of learner demand for this program over the longer term.
-

Reviewer's Comment:

SECTION D: GRADUATE OUTCOMES AND PATHWAYS

1. Employment Outcomes (*Answer the following questions*)

- a. For what types of career paths (including entrepreneurial and/or self-employment paths) and employment opportunities does the proposed program/specialization prepare graduates?
-
- b. In cases of regulated professions, how was the regulatory body consulted and what feedback did it provide in terms of labour market factors?
-
- c. Identify existing or planned program or institutional supports that enable transition from post-secondary institution to work for graduates.
-

Reviewer's Comment:

2. Learner Pathways

- a. To what extent will learners be able to transfer credits to and from other post-secondary institutions?
-

b. What types of further studies, if not within the same field, would graduates be most likely to pursue?

-

Reviewer's Comment:

3. Societal and Community Benefits *(if applicable)*

a. In cases where labour market demand is not the primary reason for this program, identify anticipated benefits from implementation of the proposed program to the wellbeing of communities in Alberta, particular those that your institutions serves:

-

Reviewer's Comment:

SECTION E: FINANCIAL VIABILITY AND SUSTAINABILITY

1. Budget and Funding Sources *(Answer the following questions)*

a. Describe how the institution plans to finance the program, (e.g. tuition, grants etc.):

-

b. Discuss risk mitigation plans should full revenue(s) not be achieved or should costs exceed amounts budgeted.

-

Reviewer's Comment:

2. Tuition and Student Cost Considerations *(Answer the following questions)*

a. Document tuition and fee projections for students (specify domestic student tuition fees, international student tuition fees, compulsory student fees, and other costs likely to be incurred by students (texts, equipment etc.). Provide rationale where appropriate such as comparisons with similar programs. (Consult with the Ministry as needed.):

-

b. Does the proposed program align with the Tuition and Fees Regulation? Yes; or No

c. Please elaborate on above answer, if necessary.

-

Reviewer's Comment:

SECTION F: INSTITUTIONAL IMPACT

1. Institutional Capacity *(Answer the following questions)*

a. Briefly describe how the proposed program aligns with the institution's mandate and government priorities.

-

b. To what extent does the program build on the institution's existing programs, infrastructure, resources and experience from offering programs in related fields?

-

Reviewer's Comment:

2. Internal Review and Approval

a. Indicate which internal governance body recommended approval and specify date of approval.

•

Reviewer's Comment:

SECTION G: SYSTEM IMPACT

1. Program/Specialization Duplication *(Answer the following questions)*

a. Does the proposed program/specialization potentially duplicate existing programming in the Alberta Adult Learning System? Yes; or No

b. If yes, list these programs.

•

c. If proposed program/specialization potentially constitutes program duplication, explain why such duplication is appropriate and beneficial in this circumstance.

•

Reviewer's Comment:

SECTION H: OTHER CONSIDERATIONS

Other considerations

a. Are there other factors or considerations the Ministry should take into account when reviewing this proposal?

•

Reviewer's Comment:

RECOMMENDATION (FOR DEPARTMENT USE)

Recommendation(s):

Rationale for Recommendation:

Reviewer(s):

Date Completed:

APPENDIX A: Program of Study - Courses and Credit Values

Calendar Description of Program

The Paleontology program provides students with knowledge and skills to increase their understanding of the evolution, ecology, and history of life on the planet. It is designed to give students a fundamental understanding of biology and geology, as well as the specialized area of paleontology. To achieve this it includes a number of core biology and geology courses. It also has some flexibility in that it contains a fair number of option courses, which allow students to explore topics in animal physiology, comparative anatomy, evolution, systematics, depositional environments, stratigraphy, and structural geology. This program also allows students to develop expertise in fossil collection, analysis, and interpretation in both field and laboratory settings.

Program of Study

EXAMPLE: MAJOR IN PALEONTOLOGY

Year	Course Number	Course Name, Description, & Prerequisites	Credits
1st	BIOL 107	Introduction to Cell Biology An introduction to cell structure and function. Major topics include the molecules and structures that comprise prokaryotic and eukaryotic cells, the mechanisms by which energy is harvested and used by cells, how cells reproduce, and how information is stored and used within a cell via the processes of DNA replication, transcription, and translation. Prerequisites: Biology 30 and Chemistry 30.	3
	BIOL 108	Introduction to Biological Diversity Examines the major lineages of life on Earth. Overview of evolutionary principles and classification, the history of life, and the key adaptations of prokaryotes, protists, fungi, plants, and animals. Laboratories survey the diversity of biological form and function, and introduce students to data collection and scientific writing. Prerequisite: Biology 30.	3
	CHEM 101	Introductory University Chemistry I Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent.	3
	EAS 100	Planet Earth Introduction to the origin and evolution of the Earth and the solar system. Introduction to plate tectonics and the rock cycle. Simple energy balances and interactions between radiation and the atmosphere, land, oceans, ice masses, and the global hydrological cycle. Evolution of life, biogeography, and global climate in the context of geologic time. The carbon cycle. Human interaction with the Earth. Mineral and energy resources.	3
	EAS 105	The Dynamic Earth Through Time The plate tectonic framework of a dynamic Earth as it relates to the origin of major groups of minerals and rocks. Earthquakes, structural geology, and the origin of mountain belts. Surface processes and their sedimentary products. History of life and extinctions. Prerequisite: EAS 100 or GEOPH 110 or GEOPH 210.	3
	MATH 117 or MATH 125	Honors Calculus I Functions, continuity, and the derivative. Applications of the derivative. Extended limits and L'Hospital's rule. Prerequisites: Mathematics 30-1 and Mathematics 31, or consent of the Department. Notes: (1) This course is designed for students with at least 80 percent in Pure Mathematics 30 or Mathematics 30-1 and Mathematics 31. (2) Credit can be obtained in at most one of MATH 100, 113, 114, 117, 134, 144, 154 or SCI 100. Linear Algebra I Systems of linear equations. Vectors in n-space, vector equations of lines and planes. Matrix algebra, inverses and invertibility. Introduction to linear transformations.	3

	or MATH 134 or MATH 144	Subspaces of n-space. Determinants. Introduction to eigenvalues and eigenvectors. Complex numbers. Dot product, cross product and orthogonality. Applications in a variety of fields. Prerequisite: Mathematics 30-1. Calculus for the Life Sciences I The derivative as a rate of change. Differentiation of elementary, trigonometric, exponential, and logarithmic functions. The definite integral as a summation. Integration. The Fundamental Theorem of Calculus. Applications in the context of the life sciences. Prerequisite: Mathematics 30-1. Calculus for the Physical Sciences I The derivative as a rate of change. Differentiation of elementary, trigonometric, exponential, and logarithmic functions. The definite integral as a summation. Integration. The Fundamental Theorem of Calculus. Taylor polynomials. Applications in the context of the physical sciences. Prerequisite: Mathematics 30-1. Note: Credit can be obtained in at most one MATH 100, 113, 114, 117, 134, 144, 154 or SCI 100.	
	STAT 151	Introduction to Applied Statistics I Data collection and presentation, descriptive statistics. Probability distributions, sampling distributions and the central limit theorem. Point estimation and hypothesis testing. Correlation and regression analysis. Goodness of fit and contingency table. Prerequisite: Mathematics 30-1 or 30-2.	3
	Communication/ Writing Requirement	Chosen from ENGL or WRS at the 100 level or higher	6
	Open Option	Any course from any Faculty	3
	TOTAL CREDITS		
2nd	BIOL 207	Molecular Genetics and Heredity The chromosomal and molecular basis for the transmission and function of genes. The construction of genetic and physical maps of genes and genomes. Strategies for the isolation of specific genes. Examples of regulatory mechanisms for the expression of the genetic material in both prokaryotes and eukaryotes. Prerequisite: BIOL 107 or SCI 100.	3
	BIOL 208	Principles of Ecology Ecology is the scientific study of interactions between organisms and their environment in a hierarchy of levels of organization: individuals, populations, communities, and ecosystems. Provides a comprehensive survey of general concepts that can stand alone or serve as preparation for advanced courses in ecology. Labs emphasize collection, analysis, and interpretation of data from ecological experiments and field studies to illustrate and complement lecture material. Examples are drawn from a broad range of organisms and systems. Prerequisite: BIOL 108 or SCI 100.	3
	BIOL 221	Mechanisms of Evolution Discusses the major features of the evolutionary process, including the fossil record, basic population genetics, variation, natural selection, adaptation, and speciation. Prerequisites: BIOL 107 and 108, or SCI 100.	3
	EAS 222	Stratigraphy and Sedimentation Origin of sedimentary materials; sedimentary processes; sedimentary structures, textures, and flow regimes; properties and classification of clastic and non-clastic rocks; sedimentary environments and facies in non-marine, coastal and marine settings; principles of stratigraphy, stratigraphic nomenclature and the stratigraphic column. Prerequisite: One of EAS 101, 103, 105 or 210.	3
	EAS 230	Introduction to Invertebrate Paleontology Systematics of important groups of invertebrate fossils. Introduction to biostratigraphy, paleoecology, and the study of mass extinctions and faunal radiations. Mechanisms and patterns of evolution. Groups covered include: Porifera, Cnidaria, Brachiopoda, Mollusca, Trilobita, Echinodermata, and some microfossil groups. Prerequisite: EAS 103, 105 or SCI 100.	3

	EAS 233	Geologic Structures Orientation, measurement description, and analysis of planar and linear structures in rocks, including folds, faults, and fabrics. Introduction to mapping and the collection of structural information. Construction of geologic maps and cross-sections. Introduction to stereographic and equal-area projections. Basic concepts of strain and stress in rock deformation. Prerequisite: EAS 105, 210 or SCI 100.	3
	EAS 234	Geology Field School Geological field studies with emphasis on properties of sedimentary rocks, paleontology, stratigraphy, Quaternary geology, structural mapping, and Cordilleran tectonics. Field exercises teach the fundamentals of recording field data, reconstructing depositional environments, and tectonic interpretation. This field school takes place immediately following the Winter examination period. Requires payment of additional student instructional support fees. Refer to the Tuition and Fees page in the University Regulations section of the Calendar. Enrolment is restricted to honours and specialization students in Geology, Environmental Earth Sciences and Paleontology. Prerequisites: EAS 233, and one of EAS 222, 235 or 236.	3
	ZOOL 242 or ZOOL 250	Animal Physiology II: Intercellular Communication Endocrinology, immunology and neural, sensory, motor, and reproductive physiology. Examples from invertebrates and vertebrates. Prerequisite: BIOL 107 or SCI 100. Survey of the Invertebrates The functional anatomy and life cycles of the major invertebrate taxa are emphasized. Prerequisite: BIOL 108 or SCI 100.	3
	Breadth from Outside the Faculty of Science	Chosen from Breadth from Outside the Faculty of Science Course Lists	3
	Open Options	Any course from any Faculty	3
	TOTAL CREDITS		
3rd	BIOL 335	Principles of Systematics An introduction to the principles, methods, and applications of biological systematics, including reconstruction of phylogenies, creation of classifications, historical biogeography, and applications in evolutionary biology. Each student will analyze phylogenetic data and write a description of a species and its relationships. Prerequisite: BIOL 108 or SCI 100 and a 200-level Biological Sciences course; BIOL 221 strongly recommended.	3
	EAS 465 or ZOOL 325	Sedimentology The science of sedimentary rocks, focusing on the interpretation of sedimentary strata. Topics vary: visit the Earth and Atmospheric Sciences course listing website for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Carbonate Sedimentology and Diagenesis; (2) Clastic Sedimentology. Prerequisite: EAS 336. Comparative Anatomy of the Vertebrates A comparative survey of form and function in vertebrate animals. Lectures focus on patterns of evolution and adaptation. Laboratories offer detailed examinations of major organ systems in representative species. Prerequisite: a 200-level ZOOL course; ZOOL 224 strongly recommended.	3
	Paleo Options	Chosen from the Paleontology Course List (with at least 6 units at the 300 level or higher)	9
	Breadth from Outside the Faculty of Science	Chosen from Breadth from Outside the Faculty of Science Course Lists	3
	Open Options	Any course from any Faculty (with at least 6 units at the 300 level or higher)	12
	TOTAL CREDITS		

4th	EAS 4XX or PALEO 4XX	Chosen from EAS or PALEO at the 400 level or higher	6
	Paleo Options	Chosen from the Paleontology Course List (with at least 3 units at the 300 level or higher and 3 units at the 400 level)	12
	Open Options	Any course from any Faculty (with at least 6 units at the 300 level or higher)	12
TOTAL CREDITS			30

Paleontology Course List

Vertebrate Paleontology:

- MA SC 412 - Biology of Fishes
- PALEO 400 - Paleontology Field School
- PALEO 418 - Paleobiology of the Vertebrates I
- PALEO 419 - Paleobiology of the Vertebrates II
- ZOOLOGY 224 - Vertebrate Diversity
- ZOOLOGY 325 - Comparative Anatomy of the Vertebrates
- ZOOLOGY 405 - Biology of Fishes
- ZOOLOGY 406 - Biology of Amphibians and Reptiles
- ZOOLOGY 407 - Biology of Birds
- ZOOLOGY 408 - Biology of Mammals

Invertebrate Paleontology:

- BOT 205 - Fundamentals of Plant Biology
- BOT 308 - Plant Anatomy
- BOT 321 - Plant Diversity and Evolution
- EAS 110 - Earth Science Field School
- EAS 336 - Sedimentary Systems
- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 460 - Geobiology
- EAS 462 - Stratigraphy and Sedimentary Basins
- EAS 465 - Sedimentology
- ENT 220 - Insect Biology
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 410 - Marine Invertebrate Zoology
- ZOOLOGY 250 - Survey of the Invertebrates

General:

- BIOL 315 - Biology: An Historical Perspective
- BIOL 361 - Marine Science
- BIOL 364 - Freshwater Ecology
- BIOL 398 - Research Project
- BIOL 399 - Research Project
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 498 - Research Project
- EAS 208 - Introduction to Global Change
- EAS 225 - Earth Surface Processes and Landforms

- EAS 270 - The Atmosphere
- EAS 320 - Geochemistry I
- EAS 373 - The Climate System
- EAS 421 - Structural Geology and Tectonics
- EAS 457 - Global Change
- PALEO 412 - Selected Topics in Paleontology
- PALEO 414 - Paleontology

Program Location

All courses associated with Paleontology are offered on the main (North) University of Alberta campus.

Delivery Mode

All courses associated with Paleontology use a face-to-face delivery mode.

Program Learning Outcomes

Students graduating from the Major in Paleontology should be able to:

1. Demonstrate fundamental knowledge of chemistry, mathematics, and statistics.
2. Demonstrate knowledge of fundamental biology topics such as cellular biology, biological diversity, molecular genetics, ecology, evolution, animal physiology, and systematics.
3. Demonstrate knowledge of fundamental geoscience topics such as mineralogy, sedimentology, stratigraphy, structural geology, and field techniques.
4. Collect, examine, and interpret data from the fossil record to provide solutions to paleontological problems related to the evolution, ecology, and history of life on the planet.
5. Explore the current limits of knowledge of paleontology by reading papers from one or more areas of active research in the field, assessing the information's credibility, and synthesizing evidence to formulate a position.
6. Communicate concepts in paleontology with both written documents and presentations.
7. Develop critical thinking and the ability to work independently and collaboratively.

APPENDIX B: Program of Study - Calendar Language

Major in Paleontology (78 units)

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- EAS 100 - Planet Earth
- EAS 105 - The Dynamic Earth Through Time
- STAT 151 - Introduction to Applied Statistics I

3 units from

- MATH 117 - Honors Calculus I
- MATH 125 - Linear Algebra I
- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Physical Sciences I

Senior Courses

- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology
- BIOL 221 - Mechanisms of Evolution
- BIOL 335 - Principles of Systematics
- EAS 222 - Stratigraphy and Sedimentation
- EAS 230 - Introduction to Invertebrate Paleontology
- EAS 233 - Geologic Structures
- EAS 234 - Geology Field School

3 units from

- ZOOL 242 - Animal Physiology II: Intercellular Communication
- ZOOL 250 - Survey of the Invertebrates

3 units from

- EAS 465 - Sedimentology
- ZOOL 325 - Comparative Anatomy of the Vertebrates

21 units from

Vertebrate Paleontology:

- MA SC 412 - Biology of Fishes
- PALEO 400 - Paleontology Field School

- PALEO 418 - Paleobiology of the Vertebrates I
- PALEO 419 - Paleobiology of the Vertebrates II
- ZOOL 224 - Vertebrate Diversity
- ZOOL 325 - Comparative Anatomy of the Vertebrates
- ZOOL 405 - Biology of Fishes
- ZOOL 406 - Biology of Amphibians and Reptiles
- ZOOL 407 - Biology of Birds
- ZOOL 408 - Biology of Mammals

Invertebrate Paleontology:

- BOT 205 - Fundamentals of Plant Biology
- BOT 308 - Plant Anatomy
- BOT 321 - Plant Diversity and Evolution
- EAS 110 - Earth Science Field School
- EAS 336 - Sedimentary Systems
- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 460 - Geobiology
- EAS 462 - Stratigraphy and Sedimentary Basins
- EAS 465 - Sedimentology
- ENT 220 - Insect Biology
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 410 - Marine Invertebrate Zoology
- ZOOL 250 - Survey of the Invertebrates

General:

- BIOL 315 - Biology: An Historical Perspective
- BIOL 361 - Marine Science
- BIOL 364 - Freshwater Ecology
- BIOL 398 - Research Project
- BIOL 399 - Research Project
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 498 - Research Project
- EAS 208 - Introduction to Global Change
- EAS 225 - Earth Surface Processes and Landforms
- EAS 270 - The Atmosphere
- EAS 320 - Geochemistry I
- EAS 373 - The Climate System
- EAS 421 - Structural Geology and Tectonics
- EAS 457 - Global Change
- PALEO 412 - Selected Topics in Paleontology
- PALEO 414 - Paleontology

6 units from

-
- any 400-level course with the following course designators:
 - EAS
 - PALEO

Notes

1. Of the 21 units required from the Vertebrate Paleontology, Invertebrate Paleontology or General lists, at least 9 units must be at the 300- and 400-level and an additional 3 units must be at the 400-level.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.
4. Some courses are offered in alternate years only, so plan your schedule appropriately.

**Governance Executive Summary
Action Item**

Agenda Title	Proposed Internal Suspension of all Science Specializations Programs, certain Honors Programs, and the Minor in Physical Sciences, Faculty of Science
---------------------	--

Motion
Motion 1

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the following BSc with Specialization programs for the period July 1, 2024 - June 30, 2029:

- a. Bachelor of Science with Specialization in Astrophysics
- b. Bachelor of Science with Specialization in Biochemistry
- c. Bachelor of Science with Specialization in Cell Biology
- d. Bachelor of Science with Specialization in Chemistry
- e. Bachelor of Science with Specialization in Computing Science
- f. Bachelor of Science with Specialization in Computing Science - Business Minor
- g. Bachelor of Science with Specialization in Computing Science - Software Practice
- h. Bachelor of Science with Specialization in Ecology, Evolution and Environmental Biology
- i. Bachelor of Science with Specialization in Environmental Earth Sciences
- j. Bachelor of Science with Specialization in Geology
- k. Bachelor of Science with Specialization in Geophysics
- l. Bachelor of Science with Specialization in Immunology and Infection
- m. Bachelor of Science with Specialization in Integrative Physiology
- n. Bachelor of Science with Specialization in Mathematics
- o. Bachelor of Science with Specialization in Mathematics - Computational Science
- p. Bachelor of Science with Specialization in Mathematics and Finance
- q. Bachelor of Science with Specialization in Mathematics and Economics
- r. Bachelor of Science with Specialization in Molecular, Cellular and Developmental Biology
- s. Bachelor of Science with Specialization in Paleontology
- t. Bachelor of Science with Specialization in Pharmacology
- u. Bachelor of Science with Specialization in Physics
- v. Bachelor of Science with Specialization in Planning
- w. Bachelor of Science with Specialization in Psychology
- x. Bachelor of Science with Specialization in Statistics

Motion 2

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the following BSc with Honors programs for the period July 1, 2024 - June 30, 2029:

- a. Bachelor of Science with Honors in Applied Mathematics - Minor in Computing Science
- b. Bachelor of Science with Honors in Applied Mathematics - Minor in Statistics
- c. Bachelor of Science with Honors in Mathematics - Minor in Computing Science
- d. Bachelor of Science with Honors in Mathematics - Minor in Statistics

Motion 3

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the suspension of the Minor in Physical Sciences for the period July 1, 2024 - June 30, 2029.

Item No. 6.B

Item

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Frederick West, Acting Dean, Faculty of Science
Presenter(s)	Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	The suspension of the Specialization and Honors programs listed above, as well as the Physical Sciences Minor, is necessary in order to facilitate the transition to Major and Honors subject areas offered under one Bachelor of Science degree program as part of the BSc Renewal Project. No major curriculum re-writes are occurring at this time; only minor to moderate changes to program requirements are necessary.
Executive Summary <i>(outline the specific item – and remember your audience)</i>	<p>In July of 2019, the Faculty of Science at the University of Alberta initiated the BSc Renewal Project with the primary goals of conducting a thorough review of its existing degree and program structure, assessing how it compared to other Faculties and institutions, and making the necessary changes for maximum improvement. The Faculty's programs had not been reviewed or updated in such a significant fashion for at least 25 years or more. Phase I of the project focused on house-cleaning – the reorganization of our degrees and programs in order to build a logical degree framework that better aligns with Campus Alberta standards, other Albertan institutions, and comparable universities from across Canada. Phase II of the project will result in the establishment of learning outcomes (at the Faculty and program levels) and adjustment of the curricular content of our programs, including scientific communication, work-integrated learning opportunities and indigenization/de-colonization. A general overview of the proposed changes associated with Phase 1 of the project is provided in this executive summary, with a more detailed explanation provided in this comprehensive report.</p> <p>With the suspension of the BSc with Specialization programs listed in Motion 1, most students will choose the corresponding new Major; a few will choose the corresponding Honors program. Overall, enrolment in each subject area should not change significantly. Current students will be advised of the impacts and options of finishing their current Specialization program or exploring the new program opportunities.</p> <p>The four Honors programs listed in Motion 2 were specially designed for Applied Mathematics and Mathematics Honors students seeking to obtain an additional credential in either Computing Science or Statistics. Currently, Honors students are not allowed to complete a Minor. So, these Minors were incorporated into the existing Honors program requirements to circumvent this rule. The new degree framework allows students to easily combine Honors subject areas</p>

Item No. 6.B

	<p>with Minor subject areas. Therefore, these particular Honors programs are no longer needed as students will be able to complete either the Applied Mathematics or Mathematics Honors program and add a Minor in either Computing Science or Statistics, if they so wish to.</p> <p>The Minor in Physical Sciences (Motion 3) is being suspended because the new framework allows students to easily combine Major or Honors subject areas with Minor subject areas, or combine two Major subject areas. Therefore, students seeking to obtain expertise in Physical Sciences, which is essentially a combination of Physics and Chemistry courses, can accomplish this goal within the new degree framework by taking a Major or Honors in Chemistry plus a Minor in Physics OR a Major or Honors in Physics plus a Minor in Chemistry OR a Double Major in Chemistry and Physics.</p> <p>The proposed changes focus on the degree structure within the Faculty of Science and require relatively minor programmatic changes. All existing subject areas will continue to be offered as Majors and Honors; therefore, there are no additional resources needed.</p>
Supplementary Notes and context	<This section is for use by University Governance only to outline governance process.>

Engagement and Routing (Include meeting dates)

<p>Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity)</p> <p><For information on the protocol see the Governance Resources section Student Participation Protocol></p>	<p><u>Those who are actively participating:</u></p> <ul style="list-style-type: none"> • Associate Chairs (Undergraduate), Faculty of Science; various meetings between 2019 and 2022 • Academic advisors and recruiters, Faculty of Science; various meetings between 2019 and 2022 <p><u>Those who have been consulted:</u></p> <ul style="list-style-type: none"> • Provost's Office (Vice-Provost, Programs); various meetings between 2019 and 2022 <p><u>Those who have been informed:</u></p> <ul style="list-style-type: none"> • N/A
Approval Route (Governance) (including meeting dates)	<p>Department of Mathematical and Statistical Sciences Council (approval obtained September 6, 2022)</p> <p>Department of Physics Council (approval obtained September 15, 2022)</p> <p>Department of Psychology Council (approval obtained September 16, 2022)</p> <p>Department of Biochemistry Council (approval obtained September 20, 2022)</p> <p>Department of Biological Sciences Council (approval obtained September 21, 2022)</p> <p>Department of Computing Science Council (approval obtained September 21, 2022)</p> <p>Department of Medical Microbiology and Immunology Council (approval obtained September 24, 2022)</p>

Item No. 6.B

	Department of Chemistry Council (approval obtained September 27, 2022) Department of Pharmacology Council (approval obtained September 28, 2022) Department of Cell Biology Council (approval obtained October 3, 2022) Department of Earth and Atmospheric Sciences Council (approval obtained October 14, 2022) Programs Support Team (October 27, 2022) Science Faculty Council (approval obtained October 28, 2022) GFC Programs Committee (November 17, 2022)
--	--

Strategic Alignment

Alignment with <i>For the Public Good</i>	Engage 17 - Facilitate, build, and support interdisciplinary, cross-faculty, and cross-unit engagement and collaboration. Sustain 21 - Encourage continuous improvement in administrative, governance, planning, and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals.	
Alignment with Core Risk Area	Please note below the specific institutional risk(s) this proposal is addressing.	
	<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input type="checkbox"/> Relationship with Stakeholders <input type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success
Legislative Compliance and jurisdiction	<i>Post-Secondary Learning Act</i> GFC Committees Terms of Reference	

Attachments

1. Internal Suspension - Science Specializations Template (pages 1 - 11)
2. Internal Suspension - Science Honors Template (pages 1- 7)
3. Internal Suspension - Physical Sciences Minor Template (pages 1 - 7)
4. Letter of Support from the Dean of Science (page 1)

Prepared by: Michelle Spila, Assistant Lecturer, Dept. of Earth & Atmospheric Sciences, spila@ualberta.ca
 Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science, sciadu@ualberta.ca

**Internal Suspension and Termination Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to suspend or terminate the following program types that do not require Ministry approval:

- Second-level specializations (e.g., minors of undergraduate programs, Honors streams of existing undergraduate programs, and second-level specializations of graduate programs)
- Embedded certificates

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca).

PROPOSAL TYPE

This proposal is for a (select one):	
<input checked="" type="checkbox"/>	Suspension - Complete Section A only
<input type="checkbox"/>	Termination - Complete Section B only

SECTION A: SUSPENSION

Suspension of a program means to suspend admissions, thereby allowing currently enrolled students to complete the requirements while preventing new students from enrolling. Suspensions are typically implemented for a five-year period. A period of suspension must precede the termination of a program.

1: Basics	
Specialization/Embedded Certificate Name	<ul style="list-style-type: none"> a. Bachelor of Science with Specialization in Astrophysics b. Bachelor of Science with Specialization in Biochemistry c. Bachelor of Science with Specialization in Cell Biology d. Bachelor of Science with Specialization in Chemistry e. Bachelor of Science with Specialization in Computing Science f. Bachelor of Science with Specialization in Computing Science - Business Minor g. Bachelor of Science with Specialization in Computing Science - Software Practice h. Bachelor of Science with Specialization in Ecology, Evolution and Environmental Biology i. Bachelor of Science with Specialization in Environmental Earth Sciences j. Bachelor of Science with Specialization in Geology k. Bachelor of Science with Specialization in Geophysics l. Bachelor of Science with Specialization in Immunology and Infection m. Bachelor of Science with Specialization in Integrative Physiology n. Bachelor of Science with Specialization in Mathematics o. Bachelor of Science with Specialization in Mathematics - Computational Science p. Bachelor of Science with Specialization in Mathematics and Finance q. Bachelor of Science with Specialization in Mathematics and Economics r. Bachelor of Science with Specialization in Molecular, Cellular and Developmental Biology



	<ul style="list-style-type: none"> s. Bachelor of Science with Specialization in Paleontology t. Bachelor of Science with Specialization in Pharmacology u. Bachelor of Science with Specialization in Physics v. Bachelor of Science with Specialization in Planning w. Bachelor of Science with Specialization in Psychology x. Bachelor of Science with Specialization in Statistics 	
Faculty/Department	<ul style="list-style-type: none"> a. Faculty of Science, Department of Physics b. Faculty of Science, Department of Biochemistry (FoMD) c. Faculty of Science, Department of Cell Biology (FoMD) d. Faculty of Science, Department of Chemistry e. Faculty of Science, Department of Computing Science f. Faculty of Science, Department of Computing Science g. Faculty of Science, Department of Computing Science h. Faculty of Science, Department of Biological Sciences i. Faculty of Science, Department of Earth and Atmospheric Sciences j. Faculty of Science, Department of Earth and Atmospheric Sciences k. Faculty of Science, Department of Physics l. Faculty of Science, Department of Biological Sciences and Department of Medical Microbiology and Immunology (FoMD) m. Faculty of Science, Department of Biological Sciences n. Faculty of Science, Department of Mathematical and Statistical Sciences o. Faculty of Science, Department of Mathematical and Statistical Sciences p. Faculty of Science, Department of Mathematical and Statistical Sciences q. Faculty of Science, Department of Mathematical and Statistical Sciences r. Faculty of Science, Department of Biological Sciences s. Faculty of Science, Department of Earth and Atmospheric Sciences t. Faculty of Science, Department of Pharmacology (FoMD) u. Faculty of Science, Department of Physics v. Faculty of Science, Department of Earth and Atmospheric Sciences w. Faculty of Science, Department of Psychology x. Faculty of Science, Department of Mathematical and Statistical Sciences 	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed start date of suspension	July 1, 2024	
Proposed end date of suspension	June 30, 2029	



Attachments

- X [Proposed Calendar changes](#)
- X [Letter of Support from the Dean of the Faculty](#)

2: Rationale, Implications, and Impacts

Rationale for Suspension of Specialization / Embedded Certificate

Explain the reason for the suspension with supporting evidence (e.g., low student demand, declining labour market demand, institutional capacity, need for program redevelopment, quality assurance review recommendation, etc.).

In July of 2019, the Faculty of Science at the University of Alberta initiated the BSc Renewal Project with the primary goals of conducting a thorough review of its existing degree and program structure, assessing how it compared to other Faculties and institutions, and making the necessary changes for maximum improvement. The Faculty’s programs had not been reviewed or updated in such a significant fashion for at least 25 years or more. Phase I of the project focused on house-cleaning – the reorganization of our degrees and programs in order to build a logical degree framework that better aligns with Campus Alberta standards, other Albertan institutions, and comparable universities from across Canada. Phase II of the project will result in the establishment of learning outcomes (at the Faculty and program levels) and adjustment of the curricular content of our programs, including scientific communication, work-integrated learning opportunities and indigenization/de-colonization. A general overview of the proposed changes associated with Phase 1 of the project is provided in this [executive summary](#), with a more detailed explanation provided in this [comprehensive report](#).

The suspension of all BSc with Specialization programs is necessary in order to facilitate the transition to Major and Honors subject areas offered under one Bachelor of Science degree program. No major curriculum re-writes are occurring at this time; only minor to moderate changes to program requirements are necessary. All subject areas listed on Page 1 will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework.

We identified seven main goals to bring the rationale for the proposed changes into focus:

Address articulation issues between degree types.

Key changes being proposed are intended to address issues arising from the fact that our current General, Specialization and Honors programs do not articulate as well as they should. Not all of our programs connect or relate to one another as they should. Students cannot always easily switch programs without going well over 120 units. In addition, not all subject areas exist at all program levels. This is particularly problematic when students cannot continue



in, or graduate from, their program when they don't quite meet the existing GPA or course load requirements.

Reduce and/or justify variability within degree types.

Requirements for the Specialization and Honors programs have largely been left up to the departments; this has led to significant variability. For example, not all Specialization programs are specified with the same level of rigour. In addition, it is difficult to say what the Honors program is since not all of them require research or an Honors thesis and sometimes students are required to do less courses in the discipline compared to the Specialization or General equivalent.

Provide the option for a Minor credential to all students.

Currently, students in the General program are required to complete a Minor (or second science Major). Only certain Specialization and Honors programs are available with specific Minors [Computing Science - Business Minor (Specialization), Applied Mathematics - Computing Science Minor (Honors), Applied Mathematics - Statistics Minor (Honors), Mathematics - Computing Science Minor (Honors), and Mathematics - Statistics Minor (Specialization & Honors)]. All students should have the option to earn a Minor credential (i.e., they should be able to pursue a Minor if they want to, no matter what program or subject area they are in).

Simplify administration from admission to graduation.

The proposed changes will simplify admission, continuation, and graduation requirements, and therefore, the processes and procedures associated with them. In particular, we aim to reduce administrative overhead and permit differential admission averages for programs in high demand.

Address Quality Assurance feedback.

Undergraduate programs in the Faculty of Science recently underwent quality assurance. Many comments and questions from external reviewers pertain to the organization and structure of our undergraduate degree programs (e.g., Why do the departmental self-studies only address the Specialization and Honors programs, but not the Major in the General program, which is where most of the students are?). The proposed changes ensure that we effectively address this very important feedback.

Improve alignment with CAQC standards and other Canadian institutions.

There are a few CAQC (Campus Alberta Quality Council) standards (see section 4.3.3.1 of the [CAQC Handbook](#)) that currently, we do not adhere to across all of our programs (e.g., breadth requirements). Our degree framework should also better align with what other Canadian universities do (e.g., the term 'General'



	<p>evokes thoughts of a broad, basic science degree; and our Majors have noticeably fewer requirements compared to other Majors across Canada).</p> <p>Establish an overarching degree framework.</p> <p>Ultimately, these proposed changes will allow us to establish a common framework within which our degree programs fit. This will lead to a standardized organization that will allow us to better communicate to our stakeholders what our degrees are. A strong foundation will allow us to more effectively guide program changes, evolve existing programs, and develop new programs. Also, the learning outcomes we are developing at the faculty level need to sit on a strong foundation for full effectiveness.</p>
<p>Document enrolments by head count for the most recent 5-year period</p>	
<p>Effectively, the existing General and Specialization programs will be merged.</p> <p>Specializations in Astrophysics (a), Biochemistry (b), Cell Biology (c), Chemistry (d), Computing Science (e), Computing Science - Software Practice (g), Ecology, Evolution and Environmental Biology, (h) Environmental Earth Sciences (i), Geology (j), Geophysics (k), Immunology and Infection (l), Integrative Physiology (m), Mathematics (n), Mathematics and Finance (p), Mathematics and Economics (q), Molecular, Cellular and Developmental Biology (r), Paleontology (s), Pharmacology (t), Physics (u), Planning (v), Psychology (w), and Statistics (x) will continue to be offered as high-quality Majors under the new proposed BSc degree program framework.</p> <p>Specializations in Computing Science - Business Minor (f) and Mathematics - Computational Science (o) will not continue to exist as unique subject areas. The new framework allows students to easily combine Major subject areas with Minor subject areas, or combine two Major subject areas. Therefore, the Specialization in Computing Science - Business Minor is essentially equivalent to the new Major in Computing Science plus a Minor in Business. The Specialization in Mathematics - Computational Science is essentially equivalent to a Double Major in Mathematics and Computing Science. Enrolment in these two existing Specialization programs will be captured in the future enrolments for the new Major in Computing Science and new Major in Mathematics.</p> <p>With the suspension of the BSc with Specialization programs, most students will choose the corresponding new Major; a few will choose the corresponding Honors program. Overall, enrolment in each subject area should not change significantly.</p>	
<p>Rationale for End date Briefly explain the rationale for the proposed end date for the suspension.</p>	<p>June 30, 2029 corresponds with the suggested minimum five-year period for the suspension of programs at the University of Alberta. The minimum period is more than sufficient considering these subject areas will continue to be offered as high-quality Major and Honors programs, and that we wish to terminate the BSc with Specialization programs as soon as possible.</p>



<p>Current Students</p> <p>Describe how active students will be assisted in completing graduation requirements during the suspension period, as well as information regarding formal communication plans.</p>	<p>All courses associated with the suspended programs will continue to be offered during the suspension period. Active students will be able to finish their studies and receive their Bachelor of Science with Specialization. With the new proposed degree framework effective September 2024, there will be no further admission to the BSc with Specialization programs effective the 2024 academic year. Students who entered a BSc with Specialization program prior to September 2024 would be required to complete all program requirements by April 30, 2029 and the last BSc with Specialization degree will be granted at Spring Convocation 2029.</p> <p>Current students will be advised of the impacts and options of finishing their current Specialization program or exploring the new program opportunities. The Faculty of Science will work with the Departments to find suitable degree exceptions where limitations are faced on courses being offered within the suspended programs in order to enable students remaining in the suspended programs the ability to complete their programs as expeditiously as possible.</p> <p>Note that during the suspension period, we will need the ability to admit current students into certain BSc with Specialization programs in special situations. For example, when a current student doesn't meet the continuation or graduation requirements for the BSc with Honors program, the Faculty of Science may need to admit the student into the corresponding BSc with Specialization program so they may continue/graduate with the least interruption. In these cases, the new degree framework may not be appropriate or advantageous for the student.</p>				
<p>Stop-Out Students</p> <p>Describe how stop-out students will be managed, including information regarding communication plans.</p>	<p>The Faculty of Science's approach has always been to readily accommodate formal student requests in these sorts of situations and there is no anticipation of that changing. Stop-out students who have started a BSc Specialization program prior to September 2024 and return to finish their degree after 2024 may opt to switch to the new Major/Honors program and follow the requirements of the new degree framework.</p>				
<p>Consultation</p> <p>Briefly describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.</p> <table border="1"> <thead> <tr> <th>Department/Group</th> <th>Meeting Occurrences</th> </tr> </thead> <tbody> <tr> <td>Biochemistry</td> <td>✓✓✓</td> </tr> </tbody> </table>	Department/Group	Meeting Occurrences	Biochemistry	✓✓✓
Department/Group	Meeting Occurrences				
Biochemistry	✓✓✓				



Biological Sciences	✓✓✓✓✓
Cell Biology	✓✓✓
Chemistry	✓✓✓
Computing Science	✓✓✓
Earth & Atmospheric Sciences	✓✓✓✓
Mathematical & Statistical Sciences	✓✓✓✓✓
Neuroscience	✓✓✓✓
Pharmacology	✓✓✓
Physics	✓✓✓✓✓
Physiology	✓✓✓
Psychology	✓✓✓✓
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓
Science Department Chairs	✓✓
Teaching & Learning Committee	✓✓
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓
Science Mentors	✓
ISSS/COSSA Executive	✓✓
Student Advisory Group	✓✓✓✓✓
Vice-Provost, Programs	✓✓✓✓✓✓
Vice-Provost, Indigenous Programming & Research	✓✓
Registrar	✓✓✓✓✓
Faculty of ALES	✓
Faculty of Arts	✓✓
Faculty of Medicine & Dentistry	✓

Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.

The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between

	<p>January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>																				
<p>Resource Implications Identify relevant financial impact, including reallocation of internal resources.</p>	<p>The proposed changes focus on the degree structure within the Faculty of Science and require relatively minor programmatic changes. All existing subject areas will continue to be offered as Majors and Honors; therefore, there are no additional resources needed. We anticipate significant savings for the Faculty with these proposed changes. The refined degree structure will result in significant reductions in the administrative work needed to manage our programs and all the associated academic policies and procedures. These resources will be reallocated to positions lost during the recent University restructuring.</p>																				
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<table border="1"> <thead> <tr> <th>Program</th> <th>Department Council</th> <th>GFC Program Support Team</th> <th>Faculty of Science Council</th> <th>GFC Programs Committee</th> </tr> </thead> <tbody> <tr> <td>a. Astrophysics</td> <td>Sept 15, 2022</td> <td rowspan="6">Oct 27, 2022</td> <td rowspan="6">Oct 28, 2022</td> <td rowspan="6">Nov 17, 2022</td> </tr> <tr> <td>b. Biochemistry</td> <td>Sept 20, 2022</td> </tr> <tr> <td>c. Cell Biology</td> <td>Oct 3, 2022</td> </tr> <tr> <td>d. Chemistry</td> <td>Sept 27, 2022</td> </tr> <tr> <td>e. Computing Science</td> <td>Sept 21, 2022</td> </tr> <tr> <td>f. Computing Science - Business Minor</td> <td>Sept 21, 2022</td> </tr> </tbody> </table>	Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee	a. Astrophysics	Sept 15, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022	b. Biochemistry	Sept 20, 2022	c. Cell Biology	Oct 3, 2022	d. Chemistry	Sept 27, 2022	e. Computing Science	Sept 21, 2022	f. Computing Science - Business Minor	Sept 21, 2022
Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee																	
a. Astrophysics	Sept 15, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022																	
b. Biochemistry	Sept 20, 2022																				
c. Cell Biology	Oct 3, 2022																				
d. Chemistry	Sept 27, 2022																				
e. Computing Science	Sept 21, 2022																				
f. Computing Science - Business Minor	Sept 21, 2022																				



	g. Computing Science - Software Practice	Sept 21, 2022			
	h. Ecology, Evolution and Environmental Biology	Sept 21, 2022			
	i. Environmental Earth Sciences	Oct 14, 2022			
	j. Geology	Oct 14, 2022			
	k. Geophysics	Sept 15, 2022			
	l. Immunology and Infection	BS: Sept 21, 2022 MMI: Sept 24, 2022			
	m. Integrative Physiology	Sept 21, 2022			
	n. Mathematics	Sept 6, 2022			
	o. Mathematics - Computational Science	Sept 6, 2022			
	p. Mathematics & Finance	Sept 6, 2022			
	q. Mathematics & Economics	Sept 6, 2022			
	r. Molecular, Cellular and Developmental Biology	Sept 21, 2022			
	s. Paleontology	Oct 14, 2022			
	t. Pharmacology	Sept 28, 2022			
	u. Physics	Sept 15, 2022			
	v. Planning	Oct 14, 2022			
	w. Psychology	Sept 16, 2022			
x. Statistics	Sept 6, 2022				

SECTION B: TERMINATION

Termination of a program means that the program has been eliminated and can no longer be offered. Terminations must be preceded by a period of suspension, typically five years.

1: Basics	
Specialization / Embedded Certificate Name	



Faculty/Department		
Contact information	Name and Title	
	Phone	
	Email	
Proposed effective date of termination		
Attachments		
<input type="checkbox"/> Proposed Calendar changes <input type="checkbox"/> Letter of Support from the Dean of the Faculty		

2: Rationale, Implications and Impacts	
Rationale for Termination Identify the reason(s) for the termination with supporting rationale and evidence.	
Was the proposal preceded by a suspension? If yes, please indicate the date of the suspension. If not, explain why a period of suspension was not implemented and indicate when students were last admitted to the program. <i>Note: terminations that are not preceded by a period of suspension must first be approved by the Vice-Provost (Programs) prior to entering the approval process.</i>	
Consultation	



<p>Describe the consultation process that occurred with relevant stakeholders.</p>	
<p>Communications Describe plans for communicating the termination decision to relevant stakeholders.</p>	
<p>Resource Implications Describe plans for reallocation of resources previously used for this Specialization/Embedded Certificate.</p>	
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	

**Internal Suspension and Termination Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to suspend or terminate the following program types that do not require Ministry approval:

- Second-level specializations (e.g., minors of undergraduate programs, Honors streams of existing undergraduate programs, and second-level specializations of graduate programs)
- Embedded certificates

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca).

PROPOSAL TYPE

This proposal is for a (select one):	
<input checked="" type="checkbox"/>	Suspension - Complete Section A only
<input type="checkbox"/>	Termination - Complete Section B only

SECTION A: SUSPENSION

Suspension of a program means to suspend admissions, thereby allowing currently enrolled students to complete the requirements while preventing new students from enrolling. Suspensions are typically implemented for a five-year period. A period of suspension must precede the termination of a program.

1: Basics	
Specialization/Embedded Certificate Name	a. Bachelor of Science with Honors in Applied Mathematics - Minor in Computing Science b. Bachelor of Science with Honors in Applied Mathematics - Minor in Statistics c. Bachelor of Science with Honors in Mathematics - Minor in Computing Science d. Bachelor of Science with Honors in Mathematics - Minor in Statistics
Faculty/Department	Faculty of Science, Department of Mathematical and Statistical Sciences
Contact information	Name and Title Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone (780) 492-4758
	Email sciadu@ualberta.ca
Proposed start date of suspension	July 1, 2024

Proposed end date of suspension	June 30, 2029
Attachments	
X	Proposed Calendar changes
X	Letter of Support from the Dean of the Faculty

2: Rationale, Implications, and Impacts	
<p>Rationale for Suspension of Specialization / Embedded Certificate</p> <p>Explain the reason for the suspension with supporting evidence (e.g., low student demand, declining labour market demand, institutional capacity, need for program redevelopment, quality assurance review recommendation, etc.).</p>	<p>The suspension of these four Honors programs is being proposed as a result of the BSc Renewal Project, which is focused on the restructuring of the Bachelor of Science degree framework in the Faculty of Science. A general overview of the proposed changes is provided in this executive summary, with a more detailed explanation provided in this comprehensive report.</p> <p>Currently, degrees are offered at three levels (General, Specialization and Honors). We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students have the option of adding a Minor to their degree program. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.</p> <p>These four Honors programs were specially designed for Applied Mathematics and Mathematics Honors students seeking to obtain an additional credential in either Computing Science or Statistics. Currently, Honors students are not allowed to complete a Minor. So, these Minors were incorporated into the existing Honors program requirements to circumvent this rule. The new degree framework allows students to easily combine Honors subject areas with Minor subject areas. Therefore, these particular Honors programs are no longer needed as students will be able to complete either the Applied Mathematics or Mathematics Honors program and add a Minor in either Computing Science or Statistics, if they so wish to.</p>



Document enrolments by head count for the most recent 5-year period

Enrolment (Total Headcount)	2018	2019	2020	2021	2022
Honors in Applied Math - Minor in Comp Sci	12	5	7	8	9
Honors in Applied Math - Minor in Statistics	6	3	6	5	5
Honors in Mathematics - Minor in Comp Sci	6	8	4	6	5
Honors in Mathematics - Minor in Statistics	0	1	3	2	1

Rationale for End date
Briefly explain the rationale for the proposed end date for the suspension.

June 30, 2029 corresponds with the suggested minimum five-year period for the suspension of programs at the University of Alberta. The minimum period is more than sufficient considering these subject areas can be studied via the new Honors/Minor combinations starting Fall 2024.

Current Students
Describe how active students will be assisted in completing graduation requirements during the suspension period, as well as information regarding formal communication plans.

All courses associated with these suspended Honors programs will continue to be offered during the suspension period. Active students will be able to finish their studies and be granted the respective Honors credential. With the new proposed degree framework effective September 2024, there will be no further admission to these four Honors programs effective the 2024 academic year. Students who entered one of these Honors programs prior to September 2024 would be required to complete all program requirements by April 30, 2029 and the last Honors credential will be granted at Spring Convocation 2029.

Current students will be advised of the impacts and options of finishing these Honors programs or exploring the new program opportunities. The Faculty of Science will work with the Department of Mathematics and Statistical Sciences to find suitable exceptions where limitations are faced on courses being offered within the suspended Honors programs in order to enable students remaining in them the ability to complete them as expeditiously as possible.

Stop-Out Students
Describe how stop-out students will be managed, including information regarding communication plans.

The Faculty of Science’s approach has always been to readily accommodate formal student requests in these sorts of situations and there is no anticipation of that changing. Stop-out students who entered one of these Honors programs prior to September 2024 but return to finish their degree after 2024 may opt to switch to an Honors/Minor program combination and follow the requirements of the new degree framework.

Consultation

Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one

Briefly describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.

discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.

Department/Group	Meeting Occurrences
Biochemistry	✓✓✓
Biological Sciences	✓✓✓✓✓
Cell Biology	✓✓✓
Chemistry	✓✓✓
Computing Science	✓✓✓
Earth & Atmospheric Sciences	✓✓✓✓
Mathematical & Statistical Sciences	✓✓✓✓✓
Neuroscience	✓✓✓✓
Pharmacology	✓✓✓
Physics	✓✓✓✓✓
Physiology	✓✓✓
Psychology	✓✓✓✓
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓
Science Department Chairs	✓✓
Teaching & Learning Committee	✓✓
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓
Science Mentors	✓
ISSS/COSSA Executive	✓✓
Student Advisory Group	✓✓✓✓✓
Vice-Provost, Programs	✓✓✓✓✓✓✓
Vice-Provost, Indigenous Programming & Research	✓✓
Registrar	✓✓✓✓✓
Faculty of ALES	✓
Faculty of Arts	✓✓
Faculty of Medicine & Dentistry	✓

Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.

The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took



	<p>place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>													
<p>Resource Implications Identify relevant financial impact, including reallocation of internal resources.</p>	<p>As the courses associated with these Honors programs will continue to be offered under the new degree framework, there are no resource implications.</p>													
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<table border="1"> <thead> <tr> <th>Program</th> <th>Department Council</th> <th>GFC Program Support Team</th> <th>Faculty of Science Council</th> <th>GFC Programs Committee</th> </tr> </thead> <tbody> <tr> <td>a. Hons Applied Mathematics - Minor in Computing Science</td> <td rowspan="4">Sept 6, 2022</td> <td rowspan="4">Oct 27, 2022</td> <td rowspan="4">Oct 28, 2022</td> <td rowspan="4">Nov 17, 2022</td> </tr> <tr> <td>b. Hons Applied Mathematics - Minor in Statistics</td> </tr> <tr> <td>c. Hons Mathematics - Minor in Computing Science</td> </tr> <tr> <td>d. Hons Mathematics - Minor in Statistics</td> </tr> </tbody> </table>	Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee	a. Hons Applied Mathematics - Minor in Computing Science	Sept 6, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022	b. Hons Applied Mathematics - Minor in Statistics	c. Hons Mathematics - Minor in Computing Science	d. Hons Mathematics - Minor in Statistics
Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee										
a. Hons Applied Mathematics - Minor in Computing Science	Sept 6, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022										
b. Hons Applied Mathematics - Minor in Statistics														
c. Hons Mathematics - Minor in Computing Science														
d. Hons Mathematics - Minor in Statistics														

SECTION B: TERMINATION

Termination of a program means that the program has been eliminated and can no longer be offered. Terminations must be preceded by a period of suspension, typically five years.

1: Basics		
Specialization / Embedded Certificate Name		
Faculty/Department		
Contact information	Name and Title	
	Phone	
	Email	
Proposed effective date of termination		
Attachments		
<input type="checkbox"/> Proposed Calendar changes <input type="checkbox"/> Letter of Support from the Dean of the Faculty		

2: Rationale, Implications and Impacts	
Rationale for Termination Identify the reason(s) for the termination with supporting rationale and evidence.	
Was the proposal preceded by a suspension? If yes, please indicate the date of the suspension. If not, explain why a period of suspension was not implemented and indicate	



<p>when students were last admitted to the program. <i>Note: terminations that are not preceded by a period of suspension must first be approved by the Vice-Provost (Programs) prior to entering the approval process.</i></p>	
<p>Consultation Describe the consultation process that occurred with relevant stakeholders.</p>	
<p>Communications Describe plans for communicating the termination decision to relevant stakeholders.</p>	
<p>Resource Implications Describe plans for reallocation of resources previously used for this Specialization/Embedded Certificate.</p>	
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	

**Internal Suspension and Termination Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to suspend or terminate the following program types that do not require Ministry approval:

- Second-level specializations (e.g., minors of undergraduate programs, Honors streams of existing undergraduate programs, and second-level specializations of graduate programs)
- Embedded certificates

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrqov@ualberta.ca).

PROPOSAL TYPE

This proposal is for a (select one):	
<input checked="" type="checkbox"/>	Suspension - Complete Section A only
<input type="checkbox"/>	Termination - Complete Section B only

SECTION A: SUSPENSION

Suspension of a program means to suspend admissions, thereby allowing currently enrolled students to complete the requirements while preventing new students from enrolling. Suspensions are typically implemented for a five-year period. A period of suspension must precede the termination of a program.

1: Basics		
Specialization/Embedded Certificate Name	Minor in Physical Sciences	
Faculty/Department	Faculty of Science, Department of Chemistry and Department of Physics	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed start date of suspension	July 1, 2024	
Proposed end date of suspension	June 30, 2029	



Attachments

- X [Proposed Calendar changes](#)
- X [Letter of Support from the Dean of the Faculty](#)

2: Rationale, Implications, and Impacts

Rationale for Suspension of Specialization / Embedded Certificate

Explain the reason for the suspension with supporting evidence (e.g., low student demand, declining labour market demand, institutional capacity, need for program redevelopment, quality assurance review recommendation, etc.).

The suspension of the Minor in Physical Sciences is being proposed as a result of the BSc Renewal Project, which is focused on the restructuring of the Bachelor of Science degree framework in the Faculty of Science. A general overview of the proposed changes is provided in this [executive summary](#), with a more detailed explanation provided in this [comprehensive report](#).

Currently, degrees are offered at three levels (General, Specialization and Honors) with only General students being allowed to complete a Minor. We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students have the option of adding a Minor to their degree program. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.

Existing Minors in Biological Sciences, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematics, Physics, Psychology, and Statistics will continue to be offered as high-quality Minors under the new proposed BSc degree program framework.

The Minor in Physical Sciences is being suspended because the new framework allows students to easily combine Major or Honors subject areas with Minor subject areas, or combine two Major subject areas. Therefore, students seeking to obtain expertise in Physical Sciences, which is essentially a combination of Physics and Chemistry courses, can accomplish this goal within the new degree framework by taking a Major or Honors in Chemistry plus a Minor in Physics OR a Major or Honors in Physics plus a Minor in Chemistry OR a Double Major in Chemistry and Physics.

Document enrolments by head count for the most recent 5-year period

Enrolment	2017	2018	2019	2020	2021
Total Headcount	16	13	15	18	14
• Year 1	N/A	N/A	N/A	0	1
• Year 2	N/A	N/A	N/A	2	2
• Year 3	N/A	N/A	N/A	2	2
• Year 4	N/A	N/A	N/A	14	9

Rationale for End date

Briefly explain the rationale for the proposed end date for the suspension.

June 30, 2029 corresponds with the suggested minimum five-year period for the suspension of programs at the University of Alberta. The minimum period is more than sufficient considering this subject area can be studied via Major/Minor, Honors/Minor or Double Major combinations.

Current Students

Describe how active students will be assisted in completing graduation requirements during the suspension period, as well as information regarding formal communication plans.

All courses associated with this suspended Minor will continue to be offered during the suspension period. Active students will be able to finish their studies and be granted the Minor in Physical Sciences credential. With the new proposed degree framework effective September 2024, there will be no further admission to the Minor in Physical Sciences effective the 2024 academic year. Students who declared the Physical Sciences Minor prior to September 2024 would be required to complete all program requirements by April 30, 2029 and the last Minor in Physical Sciences credential will be granted at Spring Convocation 2029.

Current students will be advised of the impacts and options of finishing the Minor in Physical Sciences or exploring the new program opportunities. The Faculty of Science will work with the Departments of Chemistry and Physics to find suitable exceptions where limitations are faced on courses being offered within the suspended Minor in Physical Sciences in order to enable students remaining in it the ability to complete it as expeditiously as possible.

Stop-Out Students

Describe how stop-out students will be managed, including information regarding communication plans.

The Faculty of Science's approach has always been to readily accommodate formal student requests in these sorts of situations and there is no anticipation of that changing. Stop-out students who declared a Minor in Physical Sciences prior to September 2024 but return to finish their degree after 2024 may opt to switch to a Major/Minor, Honors/Minor or Double Major program combination and follow the requirements of the new degree framework.

Consultation

Briefly describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.

Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.

Department/Group	Meeting Occurrences
Biochemistry	✓✓✓
Biological Sciences	✓✓✓✓✓
Cell Biology	✓✓✓
Chemistry	✓✓✓
Computing Science	✓✓✓
Earth & Atmospheric Sciences	✓✓✓✓
Mathematical & Statistical Sciences	✓✓✓✓✓
Neuroscience	✓✓✓✓
Pharmacology	✓✓✓
Physics	✓✓✓✓✓
Physiology	✓✓✓
Psychology	✓✓✓✓
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓
Science Department Chairs	✓✓
Teaching & Learning Committee	✓✓
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓
Science Mentors	✓
ISSS/COSSA Executive	✓✓
Student Advisory Group	✓✓✓✓✓
Vice-Provost, Programs	✓✓✓✓✓✓✓
Vice-Provost, Indigenous Programming & Research	✓✓
Registrar	✓✓✓✓✓
Faculty of ALES	✓
Faculty of Arts	✓✓
Faculty of Medicine & Dentistry	✓

Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the

	<p>knowledge and skills that all Science students should have upon graduation from the Faculty of Science.</p> <p>The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>												
<p>Resource Implications Identify relevant financial impact, including reallocation of internal resources.</p>	<p>As the courses associated with the Minor in Physical Sciences will continue to be offered under the new degree framework, there are no resource implications.</p>												
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<table border="1"> <thead> <tr> <th>Council/Committee</th> <th>Date of Approval</th> </tr> </thead> <tbody> <tr> <td>Department of Chemistry Council</td> <td>Sept 27, 2022</td> </tr> <tr> <td>Department of Physics Council</td> <td>Sept 15, 2022</td> </tr> <tr> <td>GFC Program Support Team</td> <td>Oct 27, 2022</td> </tr> <tr> <td>Faculty of Science Council</td> <td>Oct 28, 2022</td> </tr> <tr> <td>GFC Programs Committee</td> <td>Nov 17, 2022</td> </tr> </tbody> </table>	Council/Committee	Date of Approval	Department of Chemistry Council	Sept 27, 2022	Department of Physics Council	Sept 15, 2022	GFC Program Support Team	Oct 27, 2022	Faculty of Science Council	Oct 28, 2022	GFC Programs Committee	Nov 17, 2022
Council/Committee	Date of Approval												
Department of Chemistry Council	Sept 27, 2022												
Department of Physics Council	Sept 15, 2022												
GFC Program Support Team	Oct 27, 2022												
Faculty of Science Council	Oct 28, 2022												
GFC Programs Committee	Nov 17, 2022												

SECTION B: TERMINATION

Termination of a program means that the program has been eliminated and can no longer be offered. Terminations must be preceded by a period of suspension, typically five years.

1: Basics		
Specialization / Embedded Certificate Name		
Faculty/Department		
Contact information	Name and Title	
	Phone	
	Email	
Proposed effective date of termination		
Attachments		
<input type="checkbox"/> Proposed Calendar changes <input type="checkbox"/> Letter of Support from the Dean of the Faculty		

2: Rationale, Implications and Impacts	
Rationale for Termination Identify the reason(s) for the termination with supporting rationale and evidence.	
Was the proposal preceded by a suspension? If yes, please indicate the date of the suspension. If not, explain why a period of suspension was not implemented and indicate	



<p>when students were last admitted to the program. <i>Note: terminations that are not preceded by a period of suspension must first be approved by the Vice-Provost (Programs) prior to entering the approval process.</i></p>	
<p>Consultation Describe the consultation process that occurred with relevant stakeholders.</p>	
<p>Communications Describe plans for communicating the termination decision to relevant stakeholders.</p>	
<p>Resource Implications Describe plans for reallocation of resources previously used for this Specialization/Embedded Certificate.</p>	
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	



Faculty of Science, College of Natural + Applied Sciences
Office of the Dean
6-189 Centennial Centre for Interdisciplinary Science (CCIS)
Edmonton, AB, Canada T6G 2E1

T 780.492.4757
F 780.492.9434
dean.science@ualberta.ca
ualberta.ca/science

Date: October 3, 2022

From: Dr. Frederick G. West
Acting Dean, Faculty of Science

Re: Letter of Support for New Degree Framework - BSc Renewal Project

To Whom It May Concern:

Under the guidance and leadership of Dr. Gerda de Vries, Associate Dean (Undergraduate), the Faculty of Science is proposing major changes to its degree framework as part of the BSc Renewal Project. These changes revolve around the shift from three degree levels (General, Specialization and Honors) to two degree levels (Major and Honors). They also include the establishment of common program requirements to ensure consistency and articulation across all programs offered by the Faculty of Science.

These changes are long overdue considering the Bachelor of Science degree structure in the Faculty of Science has not been rigorously reviewed in over 25 years. The new degree framework better aligns our BSc programs with those from other postsecondary institutions across Alberta and Canada. It provides students with more flexibility, while maintaining the high-quality Science programs the University of Alberta has become known for and access to work-integrated learning opportunities. It also allows the Faculty of Science to utilize resources more efficiently, reduce administrative workloads, enhance interdepartmental collaboration, and more easily engage in strategic planning initiatives to develop future educational programming.

The proposed changes comprising the BSc Renewal Project include the suspension of our existing Science Specialization programs and introduction of new internal Science majors, as well as a number of other programmatic and regulatory changes necessary to bring the new degree framework into fruition. I have reviewed summaries of the proposed changes, as prepared by Dr. Gerda de Vries, Associate Dean (Undergraduate), and am in full support of everything being proposed under the umbrella of the BSc Renewal Project.

Sincerely,

Frederick G. West
Acting Dean, Faculty of Science

**Governance Executive Summary
Action Item**

Agenda Title	Proposed New Internal Majors, Honors, Second-level Specializations, and EAS Major/Minor Name Change, Faculty of Science
---------------------	--

Motion
Motion 1

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new internal Major programs, effective July 1, 2024:

- a. Bachelor of Science, Major in Applied Mathematics
- b. Bachelor of Science, Major in Biochemistry
- c. Bachelor of Science, Major in Cell Biology
- d. Bachelor of Science, Major in Ecology, Evolution and Environmental Biology
- e. Bachelor of Science, Major in Geology
- f. Bachelor of Science, Major in Geophysics
- g. Bachelor of Science, Major in Immunology and Infection
- h. Bachelor of Science, Major in Integrative Physiology
- i. Bachelor of Science, Major in Mathematical Physics
- j. Bachelor of Science, Major in Mathematics and Economics
- k. Bachelor of Science, Major in Mathematics and Finance
- l. Bachelor of Science, Major in Molecular, Cellular and Developmental Biology
- m. Bachelor of Science, Major in Neuroscience
- n. Bachelor of Science, Major in Pharmacology
- o. Bachelor of Science, Major in Physiology
- p. Bachelor of Science, Major in Planning

Motion 2

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new Honors programs, effective July 1, 2024:

- a. Bachelor of Science with Honors in Biological Sciences
- b. Bachelor of Science with Honors in Computing Science - Software Practice Option
- c. Bachelor of Science with Honors in Earth Sciences
- d. Bachelor of Science with Honors in Planning

Motion 3

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following new second-level specializations, effective July 1, 2024:

- a. Minor in Astrophysics
- b. Minor in Biochemistry
- c. Minor in Cell Biology
- d. Minor in Climate Dynamics
- e. Minor in Geophysics
- f. Minor in Pharmacology
- g. Software Practice Option

Motion 4

THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the following name changes, effective July 1, 2024:

- a. Minor in Earth and Atmospheric Sciences (to Minor in Earth Sciences)
- b. Major in Earth and Atmospheric Sciences (to Major in Earth Sciences)

Item

Item No. 6.C

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Frederick West, Acting Dean, Faculty of Science
Presenter(s)	Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	The new internal Major programs listed under Motion 1 are essentially replacing the Science Specialization programs previously suspended. The new Honors programs listed under Motion 2 currently only exist as Science Specialization programs; they are being added to ensure all subject areas are offered at both the Major and Honors level within the new degree framework. The new second-level specializations listed under Motion 3 are being added to satisfy student demand and increase enrollment in the corresponding Major/Honors. The name change from the Earth and Atmospheric Sciences Major/Minor to the Earth Sciences Major/Minor brings better alignment between the name and the program requirements. All of these additions are necessary to facilitate the transition to the new degree framework as proposed through the BSc Renewal Project.
Executive Summary <i>(outline the specific item – and remember your audience)</i>	<p>In July of 2019, the Faculty of Science at the University of Alberta initiated the BSc Renewal Project with the primary goals of conducting a thorough review of its existing degree and program structure, assessing how it compared to other Faculties and institutions, and making the necessary changes for maximum improvement. The Faculty's programs had not been reviewed or updated in such a significant fashion for at least 25 years or more. Phase I of the project focused on house-cleaning – the reorganization of our degrees and programs in order to build a logical degree framework that better aligns with Campus Alberta standards, other Albertan institutions, and comparable universities from across Canada. Phase II of the project will result in the establishment of learning outcomes (at the Faculty and program levels) and adjustment of the curricular content of our programs, including scientific communication, work-integrated learning opportunities and indigenization/de-colonization. A general overview of the proposed changes associated with Phase 1 of the project is provided in this executive summary, with a more detailed explanation provided in this comprehensive report.</p> <p>Currently, degrees are offered at three levels (General, Specialization and Honors). We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students will be able to add a Minor to their degree program, if they choose to do so. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.</p>



Item No. 6.C

	<p>With the suspension of the Science Specialization programs, most students will choose the corresponding Major; a few will choose the corresponding Honors program. Overall, enrolment in each subject area should not change significantly. Current students will be advised of the impacts and options of finishing their current Specialization/Honors program or exploring the new program opportunities.</p> <p>As mentioned previously, Honors programs do not currently exist in the subject areas listed under Motion 3.2. Their introduction is necessary in order to ensure all subject areas are offered at both the Major and Honors level in the new degree framework.</p> <p>Student demand for Minors in Biochemistry, Cell Biology and Pharmacology has been noted by the respective program advisors based on advising sessions with students. Current third and fourth year students in Biological Sciences also have specifically stated that they “wished they could have completed these new Minors”. Courses associated with the Astrophysics, Climate Dynamics and Geophysics Minors are currently experiencing low enrolment. The respective departments are hoping the addition of these Minors will increase enrolment (and potentially, interest in the associated Major/Honors programs).</p> <p>The Software Practice Option actually has been offered since 2000-2001, but for reasons unknown, the name was changed leading to misunderstandings as to what this program actually is. With this proposal, we aim to fix the name in the Calendar and establish it as “Computing Science - Software Practice Option” to ensure it is, once again, clearly identifiable as a second-level specialization, which will be available only to students enrolled in the BSc or BSc with Honors in Computing Science.</p> <p>The courses associated with these new programs are already offered as part of the existing degree framework. There are no resource implications as enrolment will be drawn from the existing BSc General/BSc with Specialization programs. The number of students completing upper-level (300 and 400 level) and capstone/research experiences may increase, the latter requiring faculty as instructors, supervisors or mentors. The affected departments (in partnership with the Faculty of Science) have at least three to four years to establish and carry out an action plan to handle this potential increase in students.</p>
Supplementary Notes and context	<This section is for use by University Governance only to outline governance process.>

Engagement and Routing (Include meeting dates)

Item No. 6.C

<p>Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity)</p> <p><For information on the protocol see the Governance Resources section Student Participation Protocol></p>	<p><u>Those who are actively participating:</u></p> <ul style="list-style-type: none"> • Associate Chairs (Undergraduate), Faculty of Science; various meetings between 2019 and 2022 • Academic advisors and recruiters, Faculty of Science; various meetings between 2019 and 2022 • Departmental curriculum committees, Faculties of Science and Medicine & Dentistry; various meetings between 2019 and 2022 <p><u>Those who have been consulted:</u></p> <ul style="list-style-type: none"> • Provost’s Office (Vice-Provost, Programs); various meetings between 2019 and 2022 • Provost’s Office (Vice-Provost, Indigenous Programming and Research); various meetings between 2021 and 2022 <p><u>Those who have been informed:</u></p> <ul style="list-style-type: none"> • Dean, College of Natural and Applied Sciences • All Faculties affected by the proposed changes, including Agricultural and Life Sciences, Arts, Business, Engineering, Kinesiology, Sports and Recreation, Medicine and Dentistry, and Native Studies
<p>Approval Route (Governance) (including meeting dates)</p>	<p>Department of Mathematical and Statistical Sciences Council (approval obtained September 6, 2022)</p> <p>Department of Physics Council (approval obtained September 15, 2022)</p> <p>Department of Psychology Council (approval obtained September 16, 2022)</p> <p>Department of Biochemistry Council (approval obtained September 20, 2022)</p> <p>Department of Biological Sciences Council (approval obtained September 21, 2022)</p> <p>Department of Computing Science Council (approval obtained September 21, 2022)</p> <p>Department of Medical Microbiology and Immunology Council (approval obtained September 24, 2022)</p> <p>Department of Chemistry Council (approval obtained September 27, 2022)</p> <p>Department of Pharmacology Council (approval obtained September 28, 2022)</p> <p>Neuroscience and Mental Health Institute Council (approval obtained September 28, 2022)</p> <p>Department of Cell Biology Council (approval obtained October 3, 2022)</p> <p>Department of Physiology Council (approval obtained October 7, 2022)</p> <p>Department of Earth and Atmospheric Sciences Council (approval obtained October 14, 2022)</p> <p>Programs Support Team (October 27, 2022)</p> <p>Science Faculty Council (approval obtained October 28, 2022)</p> <p>GFC Programs Committee (November 17, 2022)</p>

Item No. 6.C

Alignment with <i>For the Public Good</i>	Engage 17 - Facilitate, build, and support interdisciplinary, cross-faculty, and cross-unit engagement and collaboration. Sustain 21 - Encourage continuous improvement in administrative, governance, planning, and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals.	
Alignment with Core Risk Area	Please note below the specific institutional risk(s) this proposal is addressing.	
	<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input type="checkbox"/> Relationship with Stakeholders <input checked="" type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success
Legislative Compliance and jurisdiction	<i>Post-Secondary Learning Act</i> GFC Committees Terms of Reference	

Attachments

1. Internal Program Proposal - New Science Majors Template (pages 1 - 9)
2. Internal Program Proposal - New Science Honors Template (pages 1 - 6)
3. Internal Program Proposal - New Second-level Specializations Template (pages 1- 7)
4. Internal Program Proposal - EAS Name Change Template (pages 1 - 6)
5. Letter of Support from the Dean of Science (Page 1)

Prepared by: Michelle Spila, Assistant Lecturer, Dept. of Earth & Atmospheric Sciences, spila@ualberta.ca
 Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science, sciadu@ualberta.ca



**Internal Program Proposal Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to create or modify programs that do not require Ministry of Advanced Education approval.

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca). All program proponents must also consult with the Vice-Provost (Indigenous Programming & Research) during the early development stage.

PROPOSAL TYPE

This proposal is for a (select one):	
<input type="checkbox"/>	Creation of a new second-level specialization (e.g., minors of undergraduate programs and second-level specializations of graduate programs)
<input type="checkbox"/>	The addition of an Honors stream to an existing undergraduate program
<input type="checkbox"/>	Creation of a combined degree program where both contributing degrees have been approved by the Ministry of Advanced Education
<input type="checkbox"/>	Embedded Certificate
<input checked="" type="checkbox"/>	Substantive program changes that do not require Ministry approval

1: Basics	
Program/Specialization /Embedded Certificate/Combined Degree Name	<ul style="list-style-type: none"> a. Bachelor of Science, Major in Applied Mathematics b. Bachelor of Science, Major in Biochemistry c. Bachelor of Science, Major in Cell Biology d. Bachelor of Science, Major in Ecology, Evolution and Environmental Biology e. Bachelor of Science, Major in Geology f. Bachelor of Science, Major in Geophysics g. Bachelor of Science, Major in Immunology and Infection h. Bachelor of Science, Major in Integrative Physiology i. Bachelor of Science, Major in Mathematical Physics j. Bachelor of Science, Major in Mathematics and Economics k. Bachelor of Science, Major in Mathematics and Finance l. Bachelor of Science, Major in Molecular, Cellular and Developmental Biology m. Bachelor of Science, Major in Neuroscience n. Bachelor of Science, Major in Pharmacology o. Bachelor of Science, Major in Physiology p. Bachelor of Science, Major in Planning
Faculty/Department	<ul style="list-style-type: none"> a. Faculty of Science, Department of Mathematical and Statistical Sciences b. Faculty of Science, Department of Biochemistry (FoMD) c. Faculty of Science, Department of Cell Biology (FoMD) d. Faculty of Science, Department of Biological Sciences e. Faculty of Science, Department of Earth and Atmospheric Sciences f. Faculty of Science, Department of Physics



	<p>g. Faculty of Science, Department of Biological Sciences and Department of Medical Microbiology and Immunology (FoMD)</p> <p>h. Faculty of Science, Department of Biological Sciences</p> <p>i. Faculty of Science, Department of Physics</p> <p>j. Faculty of Science, Department of Mathematical and Statistical Sciences</p> <p>k. Faculty of Science, Department of Mathematical and Statistical Sciences</p> <p>l. Faculty of Science, Department of Biological Sciences</p> <p>m. Faculty of Science, Neuroscience and Mental Health Institute (NMHI; FoMD)</p> <p>n. Faculty of Science, Department of Pharmacology (FoMD)</p> <p>o. Faculty of Science, Department of Physiology (FoMD)</p> <p>p. Faculty of Science, Department of Earth and Atmospheric Sciences</p>	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed effective date	July 1, 2024	
Attachments		
<p>X Proposed Calendar changes</p> <p>X Letter of Support from the Dean of the Faculty</p>		

2: Rationale, Implications, and Impacts

<p>Rationale for the Proposal</p> <p>Identify the purpose of the proposal with supporting rationale and evidence of demand.</p>	<p>In July of 2019, the Faculty of Science at the University of Alberta initiated the BSc Renewal Project with the primary goals of conducting a thorough review of its existing degree and program structure, assessing how it compared to other Faculties and institutions, and making the necessary changes for maximum improvement. The Faculty’s programs had not been reviewed or updated in such a significant fashion for at least 25 years or more. Phase I of the project focused on house-cleaning – the reorganization of our degrees and programs in order to build a logical degree framework that better aligns with Campus Alberta standards, other Albertan institutions, and comparable universities from across Canada. Phase II of the project will result in the establishment of learning outcomes (at the Faculty and program levels) and adjustment of the curricular content of our programs, including scientific communication, work-integrated learning opportunities and indigenization/de-colonization. A general overview of the proposed changes associated with Phase 1 of the project is provided in this executive summary, with a more detailed explanation provided in this comprehensive report.</p>
--	--



Subject areas listed on Page 1 are currently offered as BSc with Specialization and/or BSc with Honors programs. Current Science Specializations are being transitioned to Major and Honors subject areas offered under one Bachelor of Science degree program. No major curriculum re-writes are occurring at this time; only minor to moderate changes to program requirements are necessary. All Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework.

We identified seven main goals to bring the rationale for the proposed changes into focus:

Address articulation issues between degree types.

Key changes being proposed are intended to address issues arising from the fact that our current General, Specialization and Honors programs do not articulate as well as they should. Not all of our programs connect or relate to one another as they should. Students cannot always easily switch programs without going well over 120 units. In addition, not all subject areas exist at all program levels. This is particularly problematic when students cannot continue in, or graduate from, their program when they don't quite meet the existing GPA or course load requirements.

Reduce and/or justify variability within degree types.

Requirements for the Specialization and Honors programs have largely been left up to the departments; this has led to significant variability. For example, not all Specialization programs are specified with the same level of rigour. In addition, it is difficult to say what the Honors program is since not all of them require research or an Honors thesis and sometimes students are required to do less courses in the discipline compared to the Specialization or General equivalent.

Provide the option for a Minor credential to all students.

Currently, students in the General program are required to complete a Minor (or second science Major). Only certain Specialization and Honors programs are available with specific Minors [Computing Science - Business Minor (Specialization), Applied Mathematics - Computing Science Minor (Honors), Applied Mathematics - Statistics Minor (Honors), Mathematics - Computing Science Minor (Honors), and Mathematics - Statistics Minor (Specialization & Honors)]. All students should have the option to earn a Minor credential (i.e., they should be able to pursue a Minor if they want to, no matter what program or subject area they are in).

Simplify administration from admission to graduation.

The proposed changes will simplify admission, continuation, and graduation requirements, and therefore, the processes and procedures associated with them. In particular, we aim to reduce administrative overhead and permit differential admission averages for programs in high demand.



	<p>Address Quality Assurance feedback.</p> <p>Undergraduate programs in the Faculty of Science recently underwent quality assurance. Many comments and questions from external reviewers pertain to the organization and structure of our undergraduate degree programs (e.g., Why do the departmental self-studies only address the Specialization and Honors programs, but not the Major in the General program, which is where most of the students are?). The proposed changes ensure that we effectively address this very important feedback.</p> <p>Improve alignment with CAQC standards and other Canadian institutions.</p> <p>There are a few CAQC (Campus Alberta Quality Council) standards (see section 4.3.3.1 of the CAQC Handbook) that currently, we do not adhere to across all of our programs (e.g., breadth requirements). Our degree framework should also better align with what other Canadian universities do (e.g., the term 'General' evokes thoughts of a broad, basic science degree; and our Majors have noticeably fewer requirements compared to other Majors across Canada).</p> <p>Establish an overarching degree framework.</p> <p>Ultimately, these proposed changes will allow us to establish a common framework within which our degree programs fit. This will lead to a standardized organization that will allow us to better communicate to our stakeholders what our degrees are. A strong foundation will allow us to more effectively guide program changes, evolve existing programs, and develop new programs. Also, the learning outcomes we are developing at the faculty level need to sit on a strong foundation for full effectiveness.</p>
<p>Length of the Program Identify the length of the program in years and credit units per year.</p>	<p>The Bachelor of Science degree is designed to be completed in 4 years with students completing 30 units per year.</p> <p>The number of units specifically associated with each Major program is provided below. Students must complete common program requirements and electives/options (which may include a Minor) to reach a total of 120 units.</p> <p>Note that certain subject areas require more units because they are accredited (e.g. Major in Geology or Geophysics) or multidisciplinary in nature (e.g. Major in Mathematics and Finance or Neuroscience).</p> <p>Major in Applied Mathematics (54 units) Major in Biochemistry (48 units) Major in Cell Biology (51 units) Major in Ecology, Evolution and Environmental Biology (54 units) Major in Geology (84 units)</p>

	<p>Major in Geophysics (81 units)</p> <p>Major in Immunology and Infection (81 units)</p> <p>Major in Integrative Physiology (54 units)</p> <p>Major in Mathematical Physics (75 units)</p> <p>Major in Mathematics and Economics (81 units)</p> <p>Major in Mathematics and Finance (84 units)</p> <p>Major in Molecular, Cellular and Developmental Biology (54 units)</p> <p>Major in Neuroscience (72 units)</p> <p>Major in Pharmacology (51 units)</p> <p>Major in Physiology (72 units)</p> <p>Major in Planning (84 units)</p>
--	--

Provide the anticipated enrolments by head count for the next 5 years

With the suspension of the existing Specialization programs, most students will choose the corresponding new Major; a few will choose the corresponding Honors program. Overall, enrolment in each subject area should not change significantly.

<p>Work-Integrated Learning Describe how learners in this program will have access to Work-Integrated Learning (see CEWIL definitions).</p>	<p>All Bachelor of Science students have the option of completing the Science Internship Program (SIP), which allows students to integrate work experience for 4, 8, 12 or 16 months into their degree.</p>
--	---

<p>Consultation Describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.</p>
--	---

Department/Group	Meeting Occurrences
Biochemistry	✓✓✓
Biological Sciences	✓✓✓✓✓
Cell Biology	✓✓✓
Chemistry	✓✓✓
Computing Science	✓✓✓
Earth & Atmospheric Sciences	✓✓✓✓
Mathematical & Statistical Sciences	✓✓✓✓✓
Neuroscience	✓✓✓✓



Pharmacology	✓✓✓
Physics	✓✓✓✓✓
Physiology	✓✓✓
Psychology	✓✓✓✓
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓
Science Department Chairs	✓✓
Teaching & Learning Committee	✓✓
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓
Science Mentors	✓
ISSS/COSSA Executive	✓✓
Student Advisory Group	✓✓✓✓✓
Vice-Provost, Programs	✓✓✓✓✓✓
Vice-Provost, Indigenous Programming & Research	✓✓
Registrar	✓✓✓✓✓
Faculty of ALES	✓
Faculty of Arts	✓✓
Faculty of Medicine & Dentistry	✓

Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.

The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.

On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student



	<p>Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>
<p>Indigenous Perspectives Describe the outcomes of the consultation with the Vice Provost (Indigenous Programming and Research) regarding how the program will integrate/include indigenous perspectives and content, and any action items that may result.</p>	<p>The Faculty of Science aspires to indigenize its curriculum. We recognize this has to occur at the course level, and that it may also occur at the program requirement level.</p> <p>To address indigenization at the course level, Acting Dean Frederick West tasked our Teaching and Learning Committee (TLC), chaired by Jocelyn Hall (Professor, Biological Sciences), with beginning the important process of decolonizing and indigenizing Science courses. The Faculty of Science recognizes that indigenization must be Indigenous led. While the scope of the committee is still being fine-tuned, some goals have been identified. First, survey Science teaching staff to determine (a) what is currently being done to decolonize/indigenize their courses, (b) what are barriers to decolonize/indigenize, and (c) what do instructors need to further the decolonization/indigenization of their courses. Second, the committee will make recommendations on some next steps in the process of decolonization/indigenization of Faculty of Science courses. Also, the committee will facilitate connecting our instructors to resources on indigenization and decolonization (Centre for Teaching and Learning, Office of the Vice-Provost [Indigenous Programming and Research], etc.).</p> <p>To address indigenization at the program requirement level, we established the indigenization of the Bachelor of Science Curriculum Working Group, chaired by Tara McGee (Professor and Associate Dean, Engagement & EDI) and co-chaired by Shawn Desaulniers (Faculty Service Officer, Mathematical and Statistical Sciences). The working group’s task was to address the following question: Will indigenization occur only at the course level or should an explicitly-stated, faculty-level program requirement (i.e. at least 3 units worth of a 120-unit degree) also be implemented?</p> <p>The working group strongly recommends that the Faculty of Science implement a faculty-level Indigenous course requirement for all BSc programs. The requirement would be that all undergraduate Bachelor of Science students in the Faculty of Science must complete at least 3 units (one course) from a curated list of Indigenous courses. The curated list should consist of courses that focus on themes such as Indigenous knowledge, ways of knowing, culture, history, languages, and contemporary Indigenous issues. Courses</p>



	<p>fulfilling this Indigenous course requirement must contain substantial Indigenous content (by consideration of the contact hours, reading list, learning objectives, and general syllabus material). The whole course should focus predominantly on the Indigenous peoples in the lands that are currently known as Canada. Whenever possible, the course should be designed and taught by appropriate knowledge holders (i.e. Indigenous instructors, Indigenous scholars, or non-Indigenous instructors trained in such areas). In relation to BSc Renewal, the Indigenous course easily can be incorporated as a breadth requirement; students can use this course to satisfy either the communication/writing requirement or the breadth from outside the Faculty of Science requirement. Eventually, when the Faculty of Science creates its own Indigenous courses, they can be used to satisfy the breadth from within the Faculty of Science requirement or even be used toward the Major/Minor/Honors requirements. More details are provided in the working group's Recommendation Document.</p> <p>Work on the Indigenous course requirement is ongoing. We are consulting with stakeholders and connecting with the faculties/departments offering courses on our draft list to determine if they are appropriate and have sufficient enrolment capacity. We intend to put forward a program change to add the Indigenous course requirement to the degree requirements as soon as there is sufficient enrolment capacity. BSc Renewal facilitates the addition of this Indigenous course requirement. The Faculty of Science recognizes that it should play a role in increasing collective enrolment capacity on campus in courses for general audiences, but the nature of the role is unclear at this time. Possibilities include developing its own Indigenous course(s), with the understanding that this initiative would need to be Indigenous led, and collaborating with other units to jointly develop new Indigenous courses.</p> <p>See this Letter of Support from the Dean of Science, Chair of the Teaching and Learning Committee, and Chairs of the Indigenization of the Bachelor of Science Curriculum Working Group.</p>
<p>Resource Implications Identify financial impacts and internal resource requirements, particularly staff and classroom and lab space. Also identify any external resource requirements such as practicum or internship placements, etc.</p>	<p>The proposed changes focus on the degree structure within the Faculty of Science and require relatively minor programmatic changes. All existing subject areas will continue to be offered as Majors and Honors; therefore, there are no additional resources needed. We anticipate significant savings for the Faculty with these proposed changes. The refined degree structure will result in significant reductions in the administrative work needed to manage our programs and all associated academic policies and procedures.</p>



Approval Process

Indicate the internal governance path, including meeting dates

Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee
a. Applied Mathematics	Sept 6, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022
b. Biochemistry	Sept 20, 2022			
c. Cell Biology	Oct 3, 2022			
d. Ecology, Evolution and Environmental Biology	Sept 21, 2022			
e. Geology	Oct 14, 2022			
f. Geophysics	Sept 15, 2022			
g. Immunology and Infection	BS: Sept 21, 2022 MMI: Sept 24, 2022			
h. Integrative Physiology	Sept 21, 2022			
i. Mathematical Physics	Sept 15, 2022			
j. Mathematics & Finance	Sept 6, 2022			
k. Mathematics & Economics	Sept 6, 2022			
l. Molecular, Cellular and Developmental Biology	Sept 21, 2022			
m. Neuroscience	Sept 28, 2022			
n. Pharmacology	Sept 28, 2022			
o. Physiology	Oct 7, 2022			
p. Planning	Oct 14, 2022			

**Internal Program Proposal Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to create or modify programs that do not require Ministry of Advanced Education approval.

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca). All program proponents must also consult with the Vice-Provost (Indigenous Programming & Research) during the early development stage.

PROPOSAL TYPE

This proposal is for a (select one):	
<input type="checkbox"/>	Creation of a new second-level specialization (e.g., minors of undergraduate programs and second-level specializations of graduate programs)
<input checked="" type="checkbox"/>	The addition of an Honors stream to an existing undergraduate program
<input type="checkbox"/>	Creation of a combined degree program where both contributing degrees have been approved by the Ministry of Advanced Education
<input type="checkbox"/>	Embedded Certificate
<input type="checkbox"/>	Substantive program changes that do not require Ministry approval

1: Basics		
Program/Specialization /Embedded Certificate/Combined Degree Name	a. Bachelor of Science with Honors in Biological Sciences b. Bachelor of Science with Honors in Computing Science - Software Practice Option c. Bachelor of Science with Honors in Earth Sciences d. Bachelor of Science with Honors in Planning	
Faculty/Department	a. Faculty of Science, Department of Biological Sciences b. Faculty of Science, Department of Computing Science c. Faculty of Science, Department of Earth & Atmospheric Sciences d. Faculty of Science, Department of Earth & Atmospheric Sciences	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed effective date	July 1, 2024	
Attachments		
<input checked="" type="checkbox"/>	Proposed Calendar changes	
<input checked="" type="checkbox"/>	Letter of Support from the Dean of the Faculty	



2: Rationale, Implications, and Impacts

Rationale for the Proposal

Identify the purpose of the proposal with supporting rationale and evidence of demand.

The new Honors listed on Page 1 are being introduced in association with the BSc Renewal Project, which is focused on the restructuring of the Bachelor of Science degree framework in the Faculty of Science. A general overview of the proposed changes is provided in this [executive summary](#), with a more detailed explanation provided in this [comprehensive report](#).

Currently, degrees are offered at three levels (General, Specialization and Honors). We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students will be able to add a Minor to their degree program, if they choose to do so. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.

Honors programs do not currently exist in these subject areas. Their introduction is necessary in order to ensure all subject areas are offered at both the Major and Honors level in the new degree framework.

Length of the Program

Identify the length of the program in years and credit units per year.

The Bachelor of Science degree is designed to be completed in 4 years with students completing 30 units per year.

The number of units specifically associated with each Honors program is provided below. Students must complete common program requirements and electives/options (which may include a Minor) to reach a total of 120 units.

Note that certain subject areas require more units because they are multidisciplinary in nature (e.g. Honors in Planning).

Honors in Biological Sciences (69 units)

Honors in Computing Science - Software Practice Option (96 units)

Honors in Earth Sciences (66 units)

Honors in Planning (96 units)

Provide the anticipated enrolments by head count for the next 5 years

Enrolment: Total Headcount	2024	2025	2026	2027	2028
a. Honors in Biological Sciences	50	60	70	80	90
b. Honors in Computing Science - Software Practice Option	50	75	100	125	150
c. Honors in Earth Sciences	10	15	20	25	30
d. Honors in Planning	5	7	10	12	15

<p>Work-Integrated Learning Describe how learners in this program will have access to Work-Integrated Learning (see CEWIL definitions).</p>	<p>All Bachelor of Science students have the option of completing the Science Internship Program (SIP), which allows students to integrate work experience for 4, 8, 12 or 16 months into their degree.</p> <p>The Computing Science - Software Practice Option requires students to complete a 8, 12, or 16 month Science Internship.</p>																																																				
<p>Consultation Describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.</p> <table border="1"> <thead> <tr> <th>Department/Group</th> <th>Meeting Occurrences</th> </tr> </thead> <tbody> <tr><td>Biochemistry</td><td>✓✓✓</td></tr> <tr><td>Biological Sciences</td><td>✓✓✓✓✓</td></tr> <tr><td>Cell Biology</td><td>✓✓✓</td></tr> <tr><td>Chemistry</td><td>✓✓✓</td></tr> <tr><td>Computing Science</td><td>✓✓✓</td></tr> <tr><td>Earth & Atmospheric Sciences</td><td>✓✓✓✓</td></tr> <tr><td>Mathematical & Statistical Sciences</td><td>✓✓✓✓✓</td></tr> <tr><td>Neuroscience</td><td>✓✓✓✓</td></tr> <tr><td>Pharmacology</td><td>✓✓✓</td></tr> <tr><td>Physics</td><td>✓✓✓✓✓</td></tr> <tr><td>Physiology</td><td>✓✓✓</td></tr> <tr><td>Psychology</td><td>✓✓✓✓</td></tr> <tr><td>Undergraduate Associate Chairs</td><td>✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓</td></tr> <tr><td>Science Department Chairs</td><td>✓✓</td></tr> <tr><td>Teaching & Learning Committee</td><td>✓✓</td></tr> <tr><td>Student Services Staff</td><td>✓✓✓✓✓✓✓✓✓✓✓✓</td></tr> <tr><td>Science Mentors</td><td>✓</td></tr> <tr><td>ISSS/COSSA Executive</td><td>✓✓</td></tr> <tr><td>Student Advisory Group</td><td>✓✓✓✓✓</td></tr> <tr><td>Vice-Provost, Programs</td><td>✓✓✓✓✓✓</td></tr> <tr><td>Vice-Provost, Indigenous Programming & Research</td><td>✓✓</td></tr> <tr><td>Registrar</td><td>✓✓✓✓✓</td></tr> <tr><td>Faculty of ALES</td><td>✓</td></tr> <tr><td>Faculty of Arts</td><td>✓✓</td></tr> <tr><td>Faculty of Medicine & Dentistry</td><td>✓</td></tr> </tbody> </table>	Department/Group	Meeting Occurrences	Biochemistry	✓✓✓	Biological Sciences	✓✓✓✓✓	Cell Biology	✓✓✓	Chemistry	✓✓✓	Computing Science	✓✓✓	Earth & Atmospheric Sciences	✓✓✓✓	Mathematical & Statistical Sciences	✓✓✓✓✓	Neuroscience	✓✓✓✓	Pharmacology	✓✓✓	Physics	✓✓✓✓✓	Physiology	✓✓✓	Psychology	✓✓✓✓	Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓	Science Department Chairs	✓✓	Teaching & Learning Committee	✓✓	Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓	Science Mentors	✓	ISSS/COSSA Executive	✓✓	Student Advisory Group	✓✓✓✓✓	Vice-Provost, Programs	✓✓✓✓✓✓	Vice-Provost, Indigenous Programming & Research	✓✓	Registrar	✓✓✓✓✓	Faculty of ALES	✓	Faculty of Arts	✓✓	Faculty of Medicine & Dentistry	✓
Department/Group	Meeting Occurrences																																																				
Biochemistry	✓✓✓																																																				
Biological Sciences	✓✓✓✓✓																																																				
Cell Biology	✓✓✓																																																				
Chemistry	✓✓✓																																																				
Computing Science	✓✓✓																																																				
Earth & Atmospheric Sciences	✓✓✓✓																																																				
Mathematical & Statistical Sciences	✓✓✓✓✓																																																				
Neuroscience	✓✓✓✓																																																				
Pharmacology	✓✓✓																																																				
Physics	✓✓✓✓✓																																																				
Physiology	✓✓✓																																																				
Psychology	✓✓✓✓																																																				
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓																																																				
Science Department Chairs	✓✓																																																				
Teaching & Learning Committee	✓✓																																																				
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓																																																				
Science Mentors	✓																																																				
ISSS/COSSA Executive	✓✓																																																				
Student Advisory Group	✓✓✓✓✓																																																				
Vice-Provost, Programs	✓✓✓✓✓✓																																																				
Vice-Provost, Indigenous Programming & Research	✓✓																																																				
Registrar	✓✓✓✓✓																																																				
Faculty of ALES	✓																																																				
Faculty of Arts	✓✓																																																				
Faculty of Medicine & Dentistry	✓																																																				



	<p>Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.</p> <p>The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>
<p>Indigenous Perspectives Describe the outcomes of the consultation with the Vice Provost (Indigenous Programming and Research) regarding how the program will integrate/include indigenous perspectives and content, and any action items that may result.</p>	<p>The Faculty of Science aspires to indigenize its curriculum. We recognize this has to occur at the course level, and that it may also occur at the program requirement level.</p> <p>To address indigenization at the course level, Acting Dean Frederick West tasked our Teaching and Learning Committee (TLC), chaired by Jocelyn Hall (Professor, Biological Sciences), with beginning the important process of decolonizing and indigenizing Science courses. The Faculty of Science recognizes that indigenization must be Indigenous led. While the scope of the committee is still being fine-tuned, some goals have been identified. First, survey Science teaching staff to determine (a) what is currently being done to decolonize/indigenize their courses, (b) what are barriers to decolonize/indigenize, and (c) what do instructors need to further the decolonization/indigenization of their courses. Second, the committee will</p>



make recommendations on some next steps in the process of decolonization/indigenization of Faculty of Science courses. Also, the committee will facilitate connecting our instructors to resources on indigenization and decolonization (Centre for Teaching and Learning, Office of the Vice-Provost [Indigenous Programming and Research], etc.).

To address indigenization at the program requirement level, we established the indigenization of the Bachelor of Science Curriculum Working Group, chaired by Tara McGee (Professor and Associate Dean, Engagement & EDI) and co-chaired by Shawn Desaulniers (Faculty Service Officer, Mathematical and Statistical Sciences). The working group's task was to address the following question: Will indigenization occur only at the course level or should an explicitly-stated, faculty-level program requirement (i.e. at least 3 units worth of a 120-unit degree) also be implemented?

The working group strongly recommends that the Faculty of Science implement a faculty-level Indigenous course requirement for all BSc programs. The requirement would be that all undergraduate Bachelor of Science students in the Faculty of Science must complete at least 3 units (one course) from a curated list of Indigenous courses. The curated list should consist of courses that focus on themes such as Indigenous knowledge, ways of knowing, culture, history, languages, and contemporary Indigenous issues. Courses fulfilling this Indigenous course requirement must contain substantial Indigenous content (by consideration of the contact hours, reading list, learning objectives, and general syllabus material). The whole course should focus predominantly on the Indigenous peoples in the lands that are currently known as Canada. Whenever possible, the course should be designed and taught by appropriate knowledge holders (i.e. Indigenous instructors, Indigenous scholars, or non-Indigenous instructors trained in such areas). In relation to BSc Renewal, the Indigenous course easily can be incorporated as a breadth requirement; students can use this course to satisfy either the communication/writing requirement or the breadth from outside the Faculty of Science requirement. Eventually, when the Faculty of Science creates its own Indigenous courses, they can be used to satisfy the breadth from within the Faculty of Science requirement or even be used toward the Major/Minor/Honors requirements. More details are provided in the working group's [Recommendation Document](#).

Work on the Indigenous course requirement is ongoing. We are consulting with stakeholders and connecting with the faculties/departments offering courses on our draft list to determine if they are appropriate and have sufficient enrolment capacity. We intend to put forward a program change to add the Indigenous course requirement to the degree requirements as soon as there is sufficient enrolment capacity. BSc Renewal facilitates the addition of this Indigenous course requirement. The Faculty of Science recognizes that it should play a role in increasing collective enrolment capacity on campus in courses for general audiences, but the nature of the role is unclear at this time. Possibilities include developing its own Indigenous course(s), with the



	<p>understanding that this initiative would need to be Indigenous led, and collaborating with other units to jointly develop new Indigenous courses.</p> <p>See this Letter of Support from the Dean of Science, Chair of the Teaching and Learning Committee, and Chairs of the Indigenization of the Bachelor of Science Curriculum Working Group.</p>																
<p>Resource Implications Identify financial impacts and internal resource requirements, particularly staff and classroom and lab space. Also identify any external resource requirements such as practicum or internship placements, etc.</p>	<p>The courses associated with the new proposed Honors are already offered as part of the existing degree framework. There are no resource implications as enrolment in these new Honors programs will be drawn from the existing BSc General/BSc with Specialization programs. The number of students completing upper-level capstone or senior research experience courses may increase, requiring faculty as instructors, supervisors or mentors. The affected departments (in partnership with the Faculty of Science) have at least three to four years to establish and carry out an action plan to handle this potential increase in students.</p>																
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<table border="1"> <thead> <tr> <th>Program</th> <th>Department Council</th> <th>GFC Program Support Team</th> <th>Faculty of Science Council</th> <th>GFC Programs Committee</th> </tr> </thead> <tbody> <tr> <td>a. Honors in Biological Sciences</td> <td>Sept 21, 2022</td> <td rowspan="4">Oct 27, 2022</td> <td rowspan="4">Oct 28, 2022</td> <td rowspan="4">Nov 17, 2022</td> </tr> <tr> <td>b. Honors in Computing Science - Software Practice Option</td> <td>Sept 21, 2022</td> </tr> <tr> <td>c. Honors in Earth Sciences</td> <td>Oct 14, 2022</td> </tr> <tr> <td>d. Honors in Planning</td> <td>Oct 14, 2022</td> </tr> </tbody> </table>	Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee	a. Honors in Biological Sciences	Sept 21, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022	b. Honors in Computing Science - Software Practice Option	Sept 21, 2022	c. Honors in Earth Sciences	Oct 14, 2022	d. Honors in Planning	Oct 14, 2022
Program	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee													
a. Honors in Biological Sciences	Sept 21, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022													
b. Honors in Computing Science - Software Practice Option	Sept 21, 2022																
c. Honors in Earth Sciences	Oct 14, 2022																
d. Honors in Planning	Oct 14, 2022																

**Internal Program Proposal Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to create or modify programs that do not require Ministry of Advanced Education approval.

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca). All program proponents must also consult with the Vice-Provost (Indigenous Programming & Research) during the early development stage.

PROPOSAL TYPE

This proposal is for a (select one):	
<input checked="" type="checkbox"/>	Creation of a new second-level specialization (e.g., minors of undergraduate programs and second-level specializations of graduate programs)
<input type="checkbox"/>	The addition of an Honors stream to an existing undergraduate program
<input type="checkbox"/>	Creation of a combined degree program where both contributing degrees have been approved by the Ministry of Advanced Education
<input type="checkbox"/>	Embedded Certificate
<input type="checkbox"/>	Substantive program changes that do not require Ministry approval

1: Basics		
Program/Specialization /Embedded Certificate/Combined Degree Name	a. Minor in Astrophysics b. Minor in Biochemistry c. Minor in Cell Biology d. Minor in Climate Dynamics e. Minor in Geophysics f. Minor in Pharmacology g. Software Practice Option	
Faculty/Department	a. Faculty of Science, Department of Physics b. Faculty of Science, Department of Biochemistry (FoMD) c. Faculty of Science, Department of Cell Biology (FoMD) d. Faculty of Science, Department of Earth & Atmospheric Sciences e. Faculty of Science, Department of Physics f. Faculty of Science, Department of Pharmacology (FoMD) g. Faculty of Science, Department of Computing Science	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed effective date	July 1, 2024	

Attachments

- X [Proposed Calendar changes](#)
- X [Letter of Support from the Dean of the Faculty](#)

2: Rationale, Implications, and Impacts
Rationale for the Proposal

Identify the purpose of the proposal with supporting rationale and evidence of demand.

The new Minors listed on Page 1 are being introduced in association with the BSc Renewal Project, which is focused on the restructuring of the Bachelor of Science degree framework in the Faculty of Science. A general overview of the proposed changes is provided in this [executive summary](#), with a more detailed explanation provided in this [comprehensive report](#).

Currently, degrees are offered at three levels (General, Specialization and Honors). We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students will be able to add a Minor to their degree program, if they choose to do so. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.

Student demand for Minors in Biochemistry, Cell Biology and Pharmacology has been noted by the respective program advisors based on advising sessions with students. Current third and fourth year students in Biological Sciences also have specifically stated that they “wished they could have completed these new Minors”. Courses associated with the Astrophysics, Climate Dynamics and Geophysics Minors are currently experiencing low enrolment. The respective departments are hoping the addition of these Minors will increase enrolment (and potentially, interest in the associated Major/Honors programs).

The Software Practice Option first appeared in the University Calendar in 2000 - 2001, albeit as the “Specialization in Computing Science - Software Quality Option”. It was proposed as a second-level specialization and therefore, Ministry approval was not required. In 2008 - 2009, for reasons unknown, the name in the Calendar was changed to “Computing Science Specialization in Software Practice”. Although this incorrect program name has appeared in the Calendar for 10+ years, the program is correctly identified on transcripts and degree parchments as “Bachelor of Science in Computing Science - Software Practice”. With this proposal, we aim to fix the name in the Calendar and establish it as “Computing Science - Software Practice Option” to ensure it is, once again, clearly identifiable as a second-level specialization, which will be available only to students enrolled in the BSc or BSc with Honors in Computing Science.

<p>Length of the Program Identify the length of the program in years and credit units per year.</p>	<p>The number of units associated with each second-level specialization is provided below. Students have the option of completing any of these second-level specializations as part of their 4-year degree program.</p> <p>Minor in Astrophysics (24 units) Minor in Biochemistry (24 units) Minor in Cell Biology (27 units) Minor in Climate Dynamics (30 units) Minor in Geophysics (24 units) Minor in Pharmacology (24 units) Software Practice Option (24 units)</p>
--	--

Provide the anticipated enrolments by head count for the next 5 years

Enrolment: Total Headcount	2024	2025	2026	2027	2028
a. Minor in Astrophysics	5	7	10	12	15
b. Minor in Biochemistry	100	110	120	130	140
c. Minor in Cell Biology	50	60	70	80	90
d. Minor in Climate Dynamics	10	12	15	17	20
e. Minor in Geophysics	5	7	10	12	15
f. Minor in Pharmacology	50	60	70	80	90
g. Software Practice Option	200	225	250	275	300

<p>Work-Integrated Learning Describe how learners in this program will have access to Work-Integrated Learning (see CEWIL definitions).</p>	<p>All Bachelor of Science students have the option of completing the Science Internship Program (SIP), which allows students to integrate work experience for 4, 8, 12 or 16 months into their degree.</p> <p>The Computing Science - Software Practice Option requires students to complete a 8, 12, or 16 month Science Internship.</p>
--	--

<p>Consultation Describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Department/Group</th> <th>Meeting Occurrences</th> </tr> </thead> <tbody> <tr> <td>Biochemistry</td> <td>✓✓✓</td> </tr> </tbody> </table>	Department/Group	Meeting Occurrences	Biochemistry	✓✓✓
Department/Group	Meeting Occurrences				
Biochemistry	✓✓✓				



Biological Sciences	✓✓✓✓✓
Cell Biology	✓✓✓
Chemistry	✓✓✓
Computing Science	✓✓✓
Earth & Atmospheric Sciences	✓✓✓✓
Mathematical & Statistical Sciences	✓✓✓✓✓
Neuroscience	✓✓✓✓
Pharmacology	✓✓✓
Physics	✓✓✓✓✓
Physiology	✓✓✓
Psychology	✓✓✓✓
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓
Science Department Chairs	✓✓
Teaching & Learning Committee	✓✓
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓
Science Mentors	✓
ISSS/COSSA Executive	✓✓
Student Advisory Group	✓✓✓✓✓
Vice-Provost, Programs	✓✓✓✓✓✓
Vice-Provost, Indigenous Programming & Research	✓✓
Registrar	✓✓✓✓✓
Faculty of ALES	✓
Faculty of Arts	✓✓
Faculty of Medicine & Dentistry	✓

Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.

The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these



	<p>advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>
<p>Indigenous Perspectives Describe the outcomes of the consultation with the Vice Provost (Indigenous Programming and Research) regarding how the program will integrate/include indigenous perspectives and content, and any action items that may result.</p>	<p>The Faculty of Science aspires to indigenize its curriculum. We recognize this has to occur at the course level, and that it may also occur at the program requirement level.</p> <p>To address indigenization at the course level, Acting Dean Frederick West tasked our Teaching and Learning Committee (TLC), chaired by Jocelyn Hall (Professor, Biological Sciences), with beginning the important process of decolonizing and indigenizing Science courses. The Faculty of Science recognizes that indigenization must be Indigenous led. While the scope of the committee is still being fine-tuned, some goals have been identified. First, survey Science teaching staff to determine (a) what is currently being done to decolonize/indigenize their courses, (b) what are barriers to decolonize/indigenize, and (c) what do instructors need to further the decolonization/indigenization of their courses. Second, the committee will make recommendations on some next steps in the process of decolonization/indigenization of Faculty of Science courses. Also, the committee will facilitate connecting our instructors to resources on indigenization and decolonization (Centre for Teaching and Learning, Office of the Vice-Provost [Indigenous Programming and Research], etc.).</p> <p>To address indigenization at the program requirement level, we established the indigenization of the Bachelor of Science Curriculum Working Group, chaired by Tara McGee (Professor and Associate Dean, Engagement & EDI) and co-chaired by Shawn Desaulniers (Faculty Service Officer, Mathematical and Statistical Sciences). The working group’s task was to address the following question: Will indigenization occur only at the course level or should an explicitly-stated, faculty-level program requirement (i.e. at least 3 units worth of a 120-unit degree) also be implemented?</p> <p>The working group strongly recommends that the Faculty of Science implement a faculty-level Indigenous course requirement for all BSc programs. The</p>



	<p>requirement would be that all undergraduate Bachelor of Science students in the Faculty of Science must complete at least 3 units (one course) from a curated list of Indigenous courses. The curated list should consist of courses that focus on themes such as Indigenous knowledge, ways of knowing, culture, history, languages, and contemporary Indigenous issues. Courses fulfilling this Indigenous course requirement must contain substantial Indigenous content (by consideration of the contact hours, reading list, learning objectives, and general syllabus material). The whole course should focus predominantly on the Indigenous peoples in the lands that are currently known as Canada. Whenever possible, the course should be designed and taught by appropriate knowledge holders (i.e. Indigenous instructors, Indigenous scholars, or non-Indigenous instructors trained in such areas). In relation to BSc Renewal, the Indigenous course easily can be incorporated as a breadth requirement; students can use this course to satisfy either the communication/writing requirement or the breadth from outside the Faculty of Science requirement. Eventually, when the Faculty of Science creates its own Indigenous courses, they can be used to satisfy the breadth from within the Faculty of Science requirement or even be used toward the Major/Minor/Honors requirements. More details are provided in the working group’s Recommendation Document.</p> <p>Work on the Indigenous course requirement is ongoing. We are consulting with stakeholders and connecting with the faculties/departments offering courses on our draft list to determine if they are appropriate and have sufficient enrolment capacity. We intend to put forward a program change to add the Indigenous course requirement to the degree requirements as soon as there is sufficient enrolment capacity. BSc Renewal facilitates the addition of this Indigenous course requirement. The Faculty of Science recognizes that it should play a role in increasing collective enrolment capacity on campus in courses for general audiences, but the nature of the role is unclear at this time. Possibilities include developing its own Indigenous course(s), with the understanding that this initiative would need to be Indigenous led, and collaborating with other units to jointly develop new Indigenous courses.</p> <p>See this Letter of Support from the Dean of Science, Chair of the Teaching and Learning Committee, and Chairs of the Indigenization of the Bachelor of Science Curriculum Working Group.</p>
<p>Resource Implications Identify financial impacts and internal resource requirements, particularly staff and classroom and lab space. Also identify any external resource requirements such as practicum or internship placements, etc.</p>	<p>The courses associated with the new proposed Minors are already offered as part of the existing degree framework (students are completing them as electives or options within their degree program). Therefore, no additional resources are required.</p> <p>The Computing Science - Software Practice Option has been offered since 2000 - 2001, along with all associated courses, as part of the existing degree framework. Therefore, no additional resources are required.</p>



Approval Process Indicate the internal governance path, including meeting dates	Second-level Specialization	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee
	a. Minor in Astrophysics	Sept 15, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022
	b. Minor in Biochemistry	Sept 20, 2022			
	c. Minor in Cell Biology	Oct 3, 2022			
	d. Minor in Climate Dynamics	Oct 14, 2022			
	e. Minor in Geophysics	Sept 15, 2022			
	f. Minor in Pharmacology	Sept 28, 2022			
	g. Software Practice Option	Sept 21, 2022			

**Internal Program Proposal Template
- for-credit programs not requiring Ministry approval -**

This template is to be used for proposals to create or modify programs that do not require Ministry of Advanced Education approval.

Faculties and Departments must consult with the Portfolio Initiatives Manager in the Office of the Provost and Vice-President (Academic) (carley.roth@ualberta.ca) on the appropriate template and process. Graduate proposers must also consult with the Faculty of Graduate Studies and Research (fgsrgov@ualberta.ca). All program proponents must also consult with the Vice-Provost (Indigenous Programming & Research) during the early development stage.

PROPOSAL TYPE

This proposal is for a (select one):	
<input type="checkbox"/>	Creation of a new second-level specialization (e.g., minors of undergraduate programs and second-level specializations of graduate programs)
<input type="checkbox"/>	The addition of an Honors stream to an existing undergraduate program
<input type="checkbox"/>	Creation of a combined degree program where both contributing degrees have been approved by the Ministry of Advanced Education
<input type="checkbox"/>	Embedded Certificate
<input checked="" type="checkbox"/>	Substantive program changes that do not require Ministry approval

1: Basics		
Program/Specialization /Embedded Certificate/Combined Degree Name	a. Minor in Earth and Atmospheric Sciences (to Minor in Earth Sciences) b. Major in Earth and Atmospheric Sciences (to Major in Earth Sciences)	
Faculty/Department	a. Faculty of Science, Department of Earth & Atmospheric Sciences b. Faculty of Science, Department of Earth & Atmospheric Sciences	
Contact information	Name and Title	Dr. Gerda de Vries Associate Dean, Undergraduate
	Phone	(780) 492-4758
	Email	sciadu@ualberta.ca
Proposed effective date	July 1, 2024	
Attachments		
<input checked="" type="checkbox"/>	Proposed Calendar changes	
<input checked="" type="checkbox"/>	Letter of Support from the Dean of the Faculty	



2: Rationale, Implications, and Impacts

Rationale for the Proposal

Identify the purpose of the proposal with supporting rationale and evidence of demand.

Currently, the Minor and Major in Earth and Atmospheric Sciences are part of the BSc General degree program. When the BSc General program was originally introduced, the name given to this Minor/Major was “Earth Sciences” because the requirements included geology, geophysics and paleontology courses. When the Department of Geology merged with the Department of Geography it underwent a name change to the Department of Earth and Atmospheric Sciences. Therefore, the name of this Minor/Major was updated (and GEOL courses were redesignated as EAS). However, the course requirements for the Minor and Major were not updated. The BSc Renewal Project has afforded the Department of Earth and Atmospheric Sciences an opportunity to rethink the requirements of the Minor and Major (presented in other proposals associated with the BSc Renewal Project) and modify them to better reflect the multidisciplinary nature of the Department. This proposal returns the name to “Earth Sciences”, which is actually more broadly representative of the new course requirements, as well as the research and teaching activities that take place in the Department of Earth and Atmospheric Sciences.

In addition, the Minor in Earth and Atmospheric Sciences will no longer be the only Minor offered out of the Department of Earth and Atmospheric Sciences. The Department is proposing a new Minor in Climate Dynamics (presented in another proposal associated with the BSc Renewal Project) and will likely introduce other Minors in the future. Therefore, this Minor will no longer be looked on as the sole, representative Minor of the Department of Earth and Atmospheric Sciences.

Length of the Program

Identify the length of the program in years and credit units per year.

The number of units associated with the Minor in Earth Sciences is 30 units. Under the new degree framework proposed as part of the BSc Renewal Project, students have the option of completing this Minor as part of their 4-year degree program.

The Major in Earth Sciences consists of 54 units and is designed to be completed in 4 years. Students must complete common program requirements and electives/options (which may include a Minor in a different subject area) to reach a total of 120 units.

Provide the anticipated enrolments by head count for the next 5 years

Enrolment: Total Headcount	2024	2025	2026	2027	2028
a. Minor in Earth Sciences	20	25	30	35	40
b. Major in Earth Sciences	80	85	90	95	100

<p>Work-Integrated Learning Describe how learners in this program will have access to Work-Integrated Learning (see CEWIL definitions).</p>	<p>All Bachelor of Science students have the option of completing the Science Internship Program (SIP), which allows students to integrate work experience for 4, 8, 12 or 16 months into their degree.</p>																																																				
<p>Consultation Describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>Consultation (for the broad BSc Renewal Project) took place between Fall 2019 and Winter 2021 in the form of small group meetings, departmental town halls, brainstorming sessions, working groups, advisory committees, and one-on-one discussions. A summary of these consultation events is provided below. Each checkmark reflects one of the aforementioned meetings; meeting duration ranged from 0.5 - 2 hours.</p> <table border="1"> <thead> <tr> <th>Department/Group</th> <th>Meeting Occurrences</th> </tr> </thead> <tbody> <tr><td>Biochemistry</td><td>✓✓✓</td></tr> <tr><td>Biological Sciences</td><td>✓✓✓✓✓</td></tr> <tr><td>Cell Biology</td><td>✓✓✓</td></tr> <tr><td>Chemistry</td><td>✓✓✓</td></tr> <tr><td>Computing Science</td><td>✓✓✓</td></tr> <tr><td>Earth & Atmospheric Sciences</td><td>✓✓✓✓</td></tr> <tr><td>Mathematical & Statistical Sciences</td><td>✓✓✓✓✓</td></tr> <tr><td>Neuroscience</td><td>✓✓✓✓</td></tr> <tr><td>Pharmacology</td><td>✓✓✓</td></tr> <tr><td>Physics</td><td>✓✓✓✓✓</td></tr> <tr><td>Physiology</td><td>✓✓✓</td></tr> <tr><td>Psychology</td><td>✓✓✓✓</td></tr> <tr><td>Undergraduate Associate Chairs</td><td>✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓</td></tr> <tr><td>Science Department Chairs</td><td>✓✓</td></tr> <tr><td>Teaching & Learning Committee</td><td>✓✓</td></tr> <tr><td>Student Services Staff</td><td>✓✓✓✓✓✓✓✓✓✓✓✓</td></tr> <tr><td>Science Mentors</td><td>✓</td></tr> <tr><td>ISSS/COSSA Executive</td><td>✓✓</td></tr> <tr><td>Student Advisory Group</td><td>✓✓✓✓✓</td></tr> <tr><td>Vice-Provost, Programs</td><td>✓✓✓✓✓✓</td></tr> <tr><td>Vice-Provost, Indigenous Programming & Research</td><td>✓✓</td></tr> <tr><td>Registrar</td><td>✓✓✓✓✓</td></tr> <tr><td>Faculty of ALES</td><td>✓</td></tr> <tr><td>Faculty of Arts</td><td>✓✓</td></tr> <tr><td>Faculty of Medicine & Dentistry</td><td>✓</td></tr> </tbody> </table>	Department/Group	Meeting Occurrences	Biochemistry	✓✓✓	Biological Sciences	✓✓✓✓✓	Cell Biology	✓✓✓	Chemistry	✓✓✓	Computing Science	✓✓✓	Earth & Atmospheric Sciences	✓✓✓✓	Mathematical & Statistical Sciences	✓✓✓✓✓	Neuroscience	✓✓✓✓	Pharmacology	✓✓✓	Physics	✓✓✓✓✓	Physiology	✓✓✓	Psychology	✓✓✓✓	Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓	Science Department Chairs	✓✓	Teaching & Learning Committee	✓✓	Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓	Science Mentors	✓	ISSS/COSSA Executive	✓✓	Student Advisory Group	✓✓✓✓✓	Vice-Provost, Programs	✓✓✓✓✓✓	Vice-Provost, Indigenous Programming & Research	✓✓	Registrar	✓✓✓✓✓	Faculty of ALES	✓	Faculty of Arts	✓✓	Faculty of Medicine & Dentistry	✓
Department/Group	Meeting Occurrences																																																				
Biochemistry	✓✓✓																																																				
Biological Sciences	✓✓✓✓✓																																																				
Cell Biology	✓✓✓																																																				
Chemistry	✓✓✓																																																				
Computing Science	✓✓✓																																																				
Earth & Atmospheric Sciences	✓✓✓✓																																																				
Mathematical & Statistical Sciences	✓✓✓✓✓																																																				
Neuroscience	✓✓✓✓																																																				
Pharmacology	✓✓✓																																																				
Physics	✓✓✓✓✓																																																				
Physiology	✓✓✓																																																				
Psychology	✓✓✓✓																																																				
Undergraduate Associate Chairs	✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓ ✓✓																																																				
Science Department Chairs	✓✓																																																				
Teaching & Learning Committee	✓✓																																																				
Student Services Staff	✓✓✓✓✓✓✓✓✓✓✓✓																																																				
Science Mentors	✓																																																				
ISSS/COSSA Executive	✓✓																																																				
Student Advisory Group	✓✓✓✓✓																																																				
Vice-Provost, Programs	✓✓✓✓✓✓																																																				
Vice-Provost, Indigenous Programming & Research	✓✓																																																				
Registrar	✓✓✓✓✓																																																				
Faculty of ALES	✓																																																				
Faculty of Arts	✓✓																																																				
Faculty of Medicine & Dentistry	✓																																																				



	<p>Student consultation took place in the form of an initial brainstorming session on January 22, 2020 with approximately 50 Science Mentors, students representing a spectrum of genders, ethnic backgrounds, and programs in various years of completion. In this session, students were asked to identify the knowledge and skills that all Science students should have upon graduation from the Faculty of Science.</p> <p>The next phase of student consultation took the form of a meeting with the executive of the Interdepartmental Science Student Society (ISSS), which took place on September 24, 2020. Key aspects of the proposed changes were presented and the executive provided feedback. They also advised that the next steps should be the establishment of a student advisory committee. The membership of this committee was established over the Fall 2020 term; meetings began in Winter 2021. The committee met every two weeks between January and April, 2021. A total of 27 students from a range of programs and completion years, genders, and ethnic backgrounds participated in these advisory committee meetings, with an average of 15 students in attendance per week. Aspects of the new proposed changes were presented at each meeting; students then had an opportunity to ask questions and provide feedback through online surveys.</p> <p>On February 10, 2022 and March 15, 2022 town hall meetings were held with ISSS and COSSA executives. COSSA is the Council of Science Student Associations, a collection of science departmental and program associations and other science-related student groups.</p> <p>The proposed changes were also reviewed by student members that sit on each of the Department and Faculty councils. Some departmental curriculum committees also include student representatives.</p> <p>In all cases, the feedback received was overwhelmingly positive.</p>
<p>Indigenous Perspectives Describe the outcomes of the consultation with the Vice Provost (Indigenous Programming and Research) regarding how the program will integrate/include indigenous perspectives and content, and any action items that may result.</p>	<p>The Faculty of Science aspires to indigenize its curriculum. We recognize this has to occur at the course level, and that it may also occur at the program requirement level.</p> <p>To address indigenization at the course level, Acting Dean Frederick West tasked our Teaching and Learning Committee (TLC), chaired by Jocelyn Hall (Professor, Biological Sciences), with beginning the important process of decolonizing and indigenizing Science courses. The Faculty of Science recognizes that indigenization must be Indigenous led. While the scope of the committee is still being fine-tuned, some goals have been identified. First, survey Science teaching staff to determine (a) what is currently being done to decolonize/indigenize their courses, (b) what are barriers to decolonize/indigenize, and (c) what do instructors need to further the decolonization/indigenization of their courses. Second, the committee will</p>



make recommendations on some next steps in the process of decolonization/indigenization of Faculty of Science courses. Also, the committee will facilitate connecting our instructors to resources on indigenization and decolonization (Centre for Teaching and Learning, Office of the Vice-Provost [Indigenous Programming and Research], etc.).

To address indigenization at the program requirement level, we established the indigenization of the Bachelor of Science Curriculum Working Group, chaired by Tara McGee (Professor and Associate Dean, Engagement & EDI) and co-chaired by Shawn Desaulniers (Faculty Service Officer, Mathematical and Statistical Sciences). The working group's task was to address the following question: Will indigenization occur only at the course level or should an explicitly-stated, faculty-level program requirement (i.e. at least 3 units worth of a 120-unit degree) also be implemented?

The working group strongly recommends that the Faculty of Science implement a faculty-level Indigenous course requirement for all BSc programs. The requirement would be that all undergraduate Bachelor of Science students in the Faculty of Science must complete at least 3 units (one course) from a curated list of Indigenous courses. The curated list should consist of courses that focus on themes such as Indigenous knowledge, ways of knowing, culture, history, languages, and contemporary Indigenous issues. Courses fulfilling this Indigenous course requirement must contain substantial Indigenous content (by consideration of the contact hours, reading list, learning objectives, and general syllabus material). The whole course should focus predominantly on the Indigenous peoples in the lands that are currently known as Canada. Whenever possible, the course should be designed and taught by appropriate knowledge holders (i.e. Indigenous instructors, Indigenous scholars, or non-Indigenous instructors trained in such areas). In relation to BSc Renewal, the Indigenous course easily can be incorporated as a breadth requirement; students can use this course to satisfy either the communication/writing requirement or the breadth from outside the Faculty of Science requirement. Eventually, when the Faculty of Science creates its own Indigenous courses, they can be used to satisfy the breadth from within the Faculty of Science requirement or even be used toward the Major/Minor/Honors requirements. More details are provided in the working group's [Recommendation Document](#).

Work on the Indigenous course requirement is ongoing. We are consulting with stakeholders and connecting with the faculties/departments offering courses on our draft list to determine if they are appropriate and have sufficient enrolment capacity. We intend to put forward a program change to add the Indigenous course requirement to the degree requirements as soon as there is sufficient enrolment capacity. BSc Renewal facilitates the addition of this Indigenous course requirement. The Faculty of Science recognizes that it should play a role in increasing collective enrolment capacity on campus in courses for general audiences, but the nature of the role is unclear at this time. Possibilities include developing its own Indigenous course(s), with the



	<p>understanding that this initiative would need to be Indigenous led, and collaborating with other units to jointly develop new Indigenous courses.</p> <p>See this Letter of Support from the Dean of Science, Chair of the Teaching and Learning Committee, and Chairs of the Indigenization of the Bachelor of Science Curriculum Working Group.</p>															
<p>Resource Implications Identify financial impacts and internal resource requirements, particularly staff and classroom and lab space. Also identify any external resource requirements such as practicum or internship placements, etc.</p>	<p>There are no resource implications associated with this proposed name change.</p>															
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<table border="1"> <thead> <tr> <th>New Name</th> <th>Department Council</th> <th>GFC Program Support Team</th> <th>Faculty of Science Council</th> <th>GFC Programs Committee</th> </tr> </thead> <tbody> <tr> <td>a. Minor in Earth Sciences</td> <td>Oct 14, 2022</td> <td>Oct 27, 2022</td> <td>Oct 28, 2022</td> <td>Nov 17, 2022</td> </tr> <tr> <td>b. Major in Earth Sciences</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	New Name	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee	a. Minor in Earth Sciences	Oct 14, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022	b. Major in Earth Sciences				
New Name	Department Council	GFC Program Support Team	Faculty of Science Council	GFC Programs Committee												
a. Minor in Earth Sciences	Oct 14, 2022	Oct 27, 2022	Oct 28, 2022	Nov 17, 2022												
b. Major in Earth Sciences																



Faculty of Science, College of Natural + Applied Sciences
Office of the Dean
6-189 Centennial Centre for Interdisciplinary Science (CCIS)
Edmonton, AB, Canada T6G 2E1

T 780.492.4757
F 780.492.9434
dean.science@ualberta.ca
ualberta.ca/science

Date: October 3, 2022

From: Dr. Frederick G. West
Acting Dean, Faculty of Science

Re: Letter of Support for New Degree Framework - BSc Renewal Project

To Whom It May Concern:

Under the guidance and leadership of Dr. Gerda de Vries, Associate Dean (Undergraduate), the Faculty of Science is proposing major changes to its degree framework as part of the BSc Renewal Project. These changes revolve around the shift from three degree levels (General, Specialization and Honors) to two degree levels (Major and Honors). They also include the establishment of common program requirements to ensure consistency and articulation across all programs offered by the Faculty of Science.

These changes are long overdue considering the Bachelor of Science degree structure in the Faculty of Science has not been rigorously reviewed in over 25 years. The new degree framework better aligns our BSc programs with those from other postsecondary institutions across Alberta and Canada. It provides students with more flexibility, while maintaining the high-quality Science programs the University of Alberta has become known for and access to work-integrated learning opportunities. It also allows the Faculty of Science to utilize resources more efficiently, reduce administrative workloads, enhance interdepartmental collaboration, and more easily engage in strategic planning initiatives to develop future educational programming.

The proposed changes comprising the BSc Renewal Project include the suspension of our existing Science Specialization programs and introduction of new internal Science majors, as well as a number of other programmatic and regulatory changes necessary to bring the new degree framework into fruition. I have reviewed summaries of the proposed changes, as prepared by Dr. Gerda de Vries, Associate Dean (Undergraduate), and am in full support of everything being proposed under the umbrella of the BSc Renewal Project.

Sincerely,

Frederick G. West
Acting Dean, Faculty of Science

**Governance Executive Summary
Action Item**

Agenda Title	Proposed Changes to Admission and Program Requirements related to the New BSc Degree Framework, BSc Renewal Project, Faculty of Science
---------------------	--

Motion

<p>THAT the GFC Programs Committee approve, under delegated authority from the General Faculties Council, the attached changes for inclusion in the 2023-2024 University Calendar:</p> <ul style="list-style-type: none"> a. Bachelor of Science General (UPDATED) b. Bachelor of Science Specialization (UPDATED) c. Bachelor of Science Honors (UPDATED) d. Bachelor of Science (Major and Honors) - Effective Fall 2024 (NEW) <ul style="list-style-type: none"> i. Breadth from Outside the Faculty of Science Course Lists (NEW) ii. Breadth from Within the Faculty of Science Course Lists (NEW) iii. Lab/Field Experience Course List (NEW) iv. Ecology, Evolution or Diversity List (NEW) v. Genetics, Molecular Biology or Microbiology List (NEW) vi. Physiology, Cell Biology or Developmental Biology List (NEW) vii. EE&E Major/Honors Course Lists A - E (NEW) e. Faculty of Science Admission Requirements (UPDATED) <ul style="list-style-type: none"> i. Subject Area Courses (NEW) f. Faculty of Science Admission Chart 7 (DELETED) g. Faculty of Science Admission Deadlines (UPDATED) h. Faculty of Science General Information (UPDATED) i. Faculty of Science Regulations (UPDATED)
--

Item

Action Requested	<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Recommendation
Proposed by	Frederick West, Acting Dean, Faculty of Science
Presenter(s)	Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is <i>(please be specific)</i>	<p>The Calendar changes associated with the new proposed degree framework, as part of the BSc Renewal Project, are quite complex. Certain changes are necessary for the 2023-2024 calendar (as presented here), while others will be necessary for the 2024-2025 calendar (to be presented at a future Programs Committee meeting). Although some sections of Calendar language were reused, the bulk of the Faculty of Science's entries have been rewritten. In addition, it is important to note that the proposed changes to the degree/program structure involve Calendar changes that are interwoven, so it is not possible to link individual Calendar change documents to the relevant</p>

Item No. 6.D

	<p>templates. Therefore, we are presenting the collective Calendar changes as a separate motion.</p>
<p>Executive Summary (<i>outline the specific item – and remember your audience</i>)</p>	<p>In July of 2019, the Faculty of Science at the University of Alberta initiated the BSc Renewal Project with the primary goals of conducting a thorough review of its existing degree and program structure, assessing how it compared to other Faculties and institutions, and making the necessary changes for maximum improvement. The Faculty’s programs had not been reviewed or updated in such a significant fashion for at least 25 years or more. Phase I of the project focused on house-cleaning – the reorganization of our degrees and programs in order to build a logical degree framework that better aligns with Campus Alberta standards, other Albertan institutions, and comparable universities from across Canada. Phase II of the project will result in the establishment of learning outcomes (at the Faculty and program levels) and adjustment of the curricular content of our programs, including scientific communication, work-integrated learning opportunities and indigenization/de-colonization. A general overview of the proposed changes associated with Phase 1 of the project is provided in this executive summary, with a more detailed explanation provided in this comprehensive report.</p> <p>Currently, degrees are offered at three levels (General, Specialization and Honors). We are proposing to move to two degree levels (Major and Honors). Therefore, all Bachelor of Science subject areas will continue to be offered as high-quality Major and Honors programs under the new proposed degree framework. In addition, all students will be able to add a Minor to their degree program, if they choose to do so. We are also taking this opportunity to build consistency and articulation between the degree levels by introducing common program requirements.</p> <p>The Calendar changes presented here encompass all necessary changes to the Faculty of Science pages for the 2023-2024 University Calendar.</p>
<p>Supplementary Notes and context</p>	<p><This section is for use by University Governance only to outline governance process.></p>

Engagement and Routing (Include meeting dates)

<p>Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity)</p>	<p><u>Those who are actively participating:</u></p> <ul style="list-style-type: none"> • Associate Chairs (Undergraduate), Faculty of Science; various meetings between 2019 and 2022 • Academic advisors and recruiters, Faculty of Science; various meetings between 2019 and 2022
<p><For information on the protocol see the Governance</p>	<p><u>Those who have been consulted:</u></p> <ul style="list-style-type: none"> • Provost’s Office (Vice-Provost, Programs); various meetings between 2019 and 2022

Item No. 6.D

Resources section Student Participation Protocol >	<ul style="list-style-type: none"> • Calendar Editor, Registrar’s Office; various meetings between 2020 and 2022 <p><u>Those who have been informed:</u></p> <ul style="list-style-type: none"> • Dean, College of Natural and Applied Sciences • All Faculties affected by the proposed changes, including Agricultural and Life Sciences, Arts, Business, Engineering, Kinesiology, Sports and Recreation, Medicine and Dentistry, and Native Studies
Approval Route (Governance) (including meeting dates)	Department of Mathematical and Statistical Sciences Council (approval obtained September 6, 2022) Department of Physics Council (approval obtained September 15, 2022) Department of Psychology Council (approval obtained September 16, 2022) Department of Biochemistry Council (approval obtained September 20, 2022) Department of Biological Sciences Council (approval obtained September 21, 2022) Department of Computing Science Council (approval obtained September 21, 2022) Department of Medical Microbiology and Immunology Council (approval obtained September 24, 2022) Department of Chemistry Council (approval obtained September 27, 2022) Department of Pharmacology Council (approval obtained September 28, 2022) Neuroscience and Mental Health Institute Council (approval obtained September 28, 2022) Department of Cell Biology Council (approval obtained October 3, 2022) Department of Physiology Council (approval obtained October 7, 2022) Department of Earth and Atmospheric Sciences Council (approval obtained October 14, 2022) Programs Support Team (October 27, 2022) Science Faculty Council (approval obtained October 28, 2022) GFC Programs Committee (November 17, 2022)

Strategic Alignment

Alignment with <i>For the Public Good</i>	<p>Engage 17 - Facilitate, build, and support interdisciplinary, cross-faculty, and cross-unit engagement and collaboration.</p> <p>Sustain 21 - Encourage continuous improvement in administrative, governance, planning, and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals.</p>
---	--



Item No. 6.D

Alignment with Core Risk Area	Please note below the specific institutional risk(s) this proposal is addressing.	
	<input checked="" type="checkbox"/> Enrolment Management <input type="checkbox"/> Faculty and Staff <input type="checkbox"/> Funding and Resource Management <input type="checkbox"/> IT Services, Software and Hardware <input type="checkbox"/> Leadership and Change <input type="checkbox"/> Physical Infrastructure	<input type="checkbox"/> Relationship with Stakeholders <input type="checkbox"/> Reputation <input type="checkbox"/> Research Enterprise <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Student Success
Legislative Compliance and jurisdiction	<i>Post-Secondary Learning Act</i> GFC Committees Terms of Reference	

Attachments

1. Bachelor of Science General (pages 1 - 2)
2. Bachelor of Science Specialization
3. Bachelor of Science Honors (pages 1 - 3)
4. Bachelor of Science (Major and Honors) - Effective Fall 2024 (pages 1 - 92)
5. Breadth from Outside the Faculty of Science Course Lists (pages 1 - 5)
6. Breadth from Within the Faculty of Science Course Lists (pages 1 - 3)
7. Lab/Field Experience Course List (pages 1 - 2)
8. Ecology, Evolution or Diversity List (pages 1 - 3)
9. Genetics, Molecular Biology or Microbiology List (pages 1 - 2)
10. Physiology, Cell Biology or Developmental Biology List (pages 1 - 2)
11. EE&E Major/Honors Course Lists A - E (pages 1 - 4)
12. Faculty of Science Admission Requirements (pages 1 - 15)
13. Subject Area Courses (pages 1 - 10)
14. Faculty of Science Admission Chart 7 (pages 1 - 6)
15. Faculty of Science Admission Deadlines (pages 1 - 3)
16. Faculty of Science General Information (pages 1 - 7)
17. Faculty of Science Regulations (pages 1 - 14)

Prepared by: Michelle Spila, Assistant Lecturer, Dept. of Earth & Atmospheric Sciences, spila@ualberta.ca
 Gerda de Vries, Associate Dean (Undergraduate), Faculty of Science, sciadu@ualberta.ca

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The admission section on this page is being updated to reflect the degree framework changes associated with the BSc Renewal Project and the new [Faculty of Science Admission Requirements](#).

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poide=42373&returnto=11345

Current

Bachelor of Science General

Return to: [Faculty of Science - Programs](#)

General Information

The BSc General program provides students with a diverse education in more than one branch of study. Students must major in a Science subject area of concentration (as defined either by a single course designator or by groupings of course designators – see below). Students may elect to minor in a Science subject area of concentration, in an Arts subject area of concentration (see [Bachelor of Arts](#)), in one of a select number of Agricultural, Life and Environmental Sciences subject areas of concentration (see [BSc General—Minor in Agricultural, Life and Environmental Sciences](#)), or in Business (see [BSc](#)

Proposed

Bachelor of Science General

Return to: [Faculty of Science - Programs](#)

General Information

The BSc General program provides students with a diverse education in more than one branch of study. Students must major in a Science subject area of concentration (as defined either by a single course designator or by groupings of course designators – see below). Students may elect to minor in a Science subject area of concentration, in an Arts subject area of concentration (see [Bachelor of Arts](#)), in one of a select number of Agricultural, Life and Environmental Sciences subject areas of concentration (see [BSc General—Minor in Agricultural, Life and Environmental Sciences](#)), or in Business (see [BSc](#)

[General—Minor in Business](#)). In addition to providing a path to the BSc General Degree, this program of study allows for subsequent transfer to Specialization and Honors programs. Students intending to transfer to Honors or Specialization programs should consult the appropriate admission requirements for the program of interest (see [Faculty of Science Admission Requirements](#)), select carefully their first-year core courses in accordance with the requirements of the specific Honors or Specialization program, and pay close attention to GPA requirements for transfer. Students in the combined BSc/BEd program should consult [Bachelor of Education in Secondary Education](#) when choosing courses for their major and minor.

Admission

See [BSc General Admission Requirements](#) for admission requirements for the BSc (General) programs.

For information about admission to the Business minor, see [BSc General—Minor in Business](#).

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see [High School Admission](#) for more information.

.

[General—Minor in Business](#)). In addition to providing a path to the BSc General Degree, this program of study allows for subsequent transfer to Specialization and Honors programs. Students intending to transfer to Honors or Specialization programs should consult the appropriate admission requirements for the program of interest (see [Faculty of Science Admission Requirements](#)), select carefully their first-year core courses in accordance with the requirements of the specific Honors or Specialization program, and pay close attention to GPA requirements for transfer. Students in the combined BSc/BEd program should consult [Bachelor of Education in Secondary Education](#) when choosing courses for their major and minor.

Admission

The Bachelor of Science degree framework has undergone a major renewal. Starting Fall 2024 students will choose from two pathways, BSc (Major) versus BSc (Honors). The BSc General program will be discontinued effective Fall 2024.

Students who entered the BSc General program prior to Fall 2024 must complete all program requirements by April 30, 2029. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. It may be possible for some students to follow the program requirements and regulations governing the new Bachelor of Science degree program (as presented below); consult an Academic Advisor to discuss the possibility of transitioning between program pathways.

Please see [Faculty of Science Admission Requirements](#) for information regarding admission into the new Bachelor of Science degree program.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see [High School Admission](#) for more information.

.

<ul style="list-style-type: none">••	<ul style="list-style-type: none">••
---	---

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The admission section on this page is being updated to reflect the degree framework changes associated with the BSc Renewal Project and the new [Faculty of Science Admission Requirements](#).

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poiid=42306&returnto=11345

Current

Bachelor of Science Specialization

Return to: [Faculty of Science - Programs](#)

Four-year programs, comprising a minimum of 120 units, provide education to a professional level and lead to the degree of BSc with Specialization.

Specialization programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Pharmacology, Physics, and Psychology.

A five-year (150 units) BEd/BSc (Specialization in Science and Education) program with majors and minors in Biological, Mathematical, and Physical Sciences is also available (see [BSc Honors](#) and [BSc Specialization](#) and [BSc](#)

Proposed

Bachelor of Science Specialization

Return to: [Faculty of Science - Programs](#)

Four-year programs, comprising a minimum of 120 units, provide education to a professional level and lead to the degree of BSc with Specialization.

Specialization programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Pharmacology, Physics, and Psychology.

A five-year (150 units) BEd/BSc (Specialization in Science and Education) program with majors and minors in Biological, Mathematical, and Physical Sciences is also available (see [BSc Honors](#) and [BSc Specialization](#) and [BSc](#)

(Specialization in Science and Education)/BEd (Secondary) Combined Degrees Program [Science].

Admission

See BSc Honors and BSc Specialization Admission Requirements for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the Faculty of Science Programs website for more information.

The following regulations govern Specialization programs:

1. In each year, a Specialization student's program must be approved by a Specialization advisor in the appropriate Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Specialization programs. Certain Departments may require more than 72 units. BSc Specialization in Planning requires a minimum of 66 units in Science.
3. A student must take at least 18 units in Arts courses as part of the requirements for most Specialization degrees.
4. Normally, no more than 42 units in junior courses

(Specialization in Science and Education)/BEd (Secondary) Combined Degrees Program [Science].

Admission

The Bachelor of Science degree framework has undergone a major renewal. Starting Fall 2024 students will choose from two pathways, BSc (Major) versus BSc (Honors). All BSc Specialization programs will be discontinued effective Fall 2024.

Students who entered a BSc Specialization program prior to Fall 2024 must complete all program requirements by April 30, 2029. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. It may be possible for some students to follow the program requirements and regulations governing the new Bachelor of Science degree program (as presented below); consult an Academic Advisor to discuss the possibility of transitioning between program pathways.

Please see Faculty of Science Admission Requirements for information regarding admission into the new Bachelor of Science degree program.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the Faculty of Science Programs website for more information.

The following regulations govern Specialization programs:

6. In each year, a Specialization student's program must be approved by a Specialization advisor in the appropriate Department and by the Faculty Office.
7. A minimum of 72 units in Science is required in most Specialization programs. Certain Departments may require more than 72 units. BSc Specialization in Planning requires a minimum of 66 units in Science.
8. A student must take at least 18 units in Arts courses as part of the requirements for most Specialization degrees.
9. Normally, no more than 42 units in junior courses

<p>are permitted in Specialization programs.</p> <p>5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Specialization programs with the prior written approval of the Department directing the student's program.</p> <p>Applicants to the BSc Specialization program who have taken non-Arts and non-Science courses before application will have the potential transfer credit for such courses assessed at the time of admission to the program.</p> <ul style="list-style-type: none">•••	<p>are permitted in Specialization programs.</p> <p>10. Certain non-Arts and non-Science courses appropriate to the program may be permitted in Specialization programs with the prior written approval of the Department directing the student's program.</p> <p>Applicants to the BSc Specialization program who have taken non-Arts and non-Science courses before application will have the potential transfer credit for such courses assessed at the time of admission to the program.</p> <ul style="list-style-type: none">•••
---	--

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs. Faculty Approval: October 28, 2022
Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The admission section on this page is being updated to reflect the degree framework changes associated with the BSc Renewal Project and the new [Faculty of Science Admission Requirements](#).

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

https://calendar.ualberta.ca/preview_program.php?catoid=36&poide=42307&returnto=11345

Current

Bachelor of Science Honors

Return to: [Faculty of Science - Programs](#)

A minimum of 120 units normally taken in no more than five consecutive academic years is required to complete the Honors program for the degree of BSc with Honors. Some departments require that an Honors program be completed in four years, others permit five. See individual departments for details. These programs provide specialization in the chosen subject or subjects as well as the higher standard implied by the term "Honors."

Honors programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Neuroscience, Pharmacology, Physics, Physiology, and Psychology.

Proposed

Bachelor of Science Honors

Return to: [Faculty of Science - Programs](#)

A minimum of 120 units normally taken in no more than five consecutive academic years is required to complete the Honors program for the degree of BSc with Honors. Some departments require that an Honors program be completed in four years, others permit five. See individual departments for details. These programs provide specialization in the chosen subject or subjects as well as the higher standard implied by the term "Honors."

Honors programs are available in the Departments of Biochemistry, Biological Sciences, Cell Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematical and Statistical Sciences, Neuroscience, Pharmacology, Physics, Physiology, and Psychology.

Honors is the preferred program for students who plan graduate study.

Admission

See [BSc \(Honors\)](#) for admission requirements.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Honors programs:

1. In each year, an Honors student's program must be approved by an Honors Advisor in the student's Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Honors programs. Certain Departments may require more than 72 units in Science courses.
3. A student normally must take at least 18 units in Arts courses as part of the requirements for the Honors degree.
4. Normally, no more than 42 units in junior (100-level) courses are permitted in Honors programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in

Honors is the preferred program for students who plan graduate study.

Admission

The Bachelor of Science degree framework has undergone a major renewal. Starting Fall 2024 students will choose from two pathways, BSc (Major) versus BSc (Honors).

Students who entered a BSc Honors program prior to Fall 2024 must complete all program requirements by April 30, 2029. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. It may be possible for some students to follow the program requirements and regulations governing the new Bachelor of Science degree program (as presented below); consult an Academic Advisor to discuss the possibility of transitioning between program pathways.

Please see [Faculty of Science Admission Requirements](#) for information regarding admission into the new Bachelor of Science degree program.

Selection of Courses

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see the [Faculty of Science Programs website](#) for more information.

The following regulations govern Honors programs:

1. In each year, an Honors student's program must be approved by an Honors Advisor in the student's Department and by the Faculty Office.
2. A minimum of 72 units in Science is required in most Honors programs. Certain Departments may require more than 72 units in Science courses.
3. A student normally must take at least 18 units in Arts courses as part of the requirements for the Honors degree.
4. Normally, no more than 42 units in junior (100-level) courses are permitted in Honors programs.
5. Certain non-Arts and non-Science courses appropriate to the program may be permitted in

<p>Honors programs with the written approval of the Department directing the student's program.</p> <p>Applicants to the BSc Honors program who have taken non-Arts and non-Science courses before application will have the potential to transfer credit for such courses assessed at the time of admission to the program.</p> <ul style="list-style-type: none">•••	<p>Honors programs with the written approval of the Department directing the student's program.</p> <p>Applicants to the BSc Honors program who have taken non-Arts and non-Science courses before application will have the potential to transfer credit for such courses assessed at the time of admission to the program.</p> <ul style="list-style-type: none">•••
--	--

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs. Faculty Approval: October 28, 2022</p>
<p>Other consultation groups, departments, or internal faculty approving bodies and approval dates.</p>

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 Calendar. These proposed changes accompany the BSc Renewal Project, which focuses on updating and revamping the way programs and degrees are structured in the Faculty of Science. The main result of the BSc Renewal project is the shift from three program levels (General, Specialization and Honors) to two program levels (Major and Honors), which will address many of the structural and procedural issues that have developed over the past 25 years or so. It benefits all Science students and departments by providing a more coherent and logical degree framework. The associated processes, policies, requirements, and regulations have also been reviewed and updated to maximize clarity and consistency, as well as reduce administrative overhead. These changes must appear in the 2023-2024 calendar year in order to inform applicants of the degree structure and program requirements in effect for Fall 2024.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Bachelor of Science (Major and Honors) - Effective Fall 2024

[← Return to: Faculty of Science](#)

Note:

The Bachelor of Science degree framework has undergone a major renewal. Starting Fall 2024 students will choose from two pathways, BSc (Major) versus BSc (Honors). The BSc General and BSc Specialization programs will be discontinued effective Fall 2024.

Students who entered a BSc General, BSc Specialization or BSc Honors program prior to Fall 2024 must complete all program requirements by April 30, 2029. Refer to the Calendar in effect at the time you were admitted or readmitted for the regulations governing the degree program requirements. It may be possible for some students to follow the program requirements and regulations governing the new Bachelor of Science degree program (as presented below); consult an Academic Advisor to discuss the possibility of transitioning between program pathways.

Please see [Faculty of Science Admission Requirements](#) for information regarding admission into the new Bachelor of Science degree program.

General Information

The Bachelor of Science degree is designed to provide students with a diversified education and specialization in at least one subject area. Students in the Bachelor of Science degree must declare a Major subject area, and may declare a Minor subject area. Students in certain subject areas may declare a second Major subject area (from a list of eligible subject areas).

Alternatively, students may choose to complete a Bachelor of Science with Honors degree, which provides a challenging and rewarding learning experience within a subject area. It offers a greater depth of engagement, including a research or capstone experience, and demands a higher standard of performance. Students following this path must declare an Honors subject area. They may declare a Minor subject area; they may not declare a second Major or Honors subject area.

Admission

- [General Undergraduate Admission Requirements \(link\)](#)
- [Faculty of Science Admission Requirements \(link\)](#)

Regulations

- [University Regulations \(link\)](#)
- [Faculty of Science Regulations \(link\)](#)

Students must ensure they are familiar with and follow all University Regulations and Faculty of Science Regulations in addition to the program requirements outlined below.

Program Requirements

The Bachelor of Science (Major and Honors) degree requires the successful completion of 120 units including the following:

1. **Communication/Writing Courses:** Successful completion of a minimum of 6 units in English (ENGL) or Writing Studies (WRS).
2. **Breadth from Outside the Faculty of Science:** Successful completion of a minimum of 6 units, with at least 3 units from two of the following categories:
 - Applied Sciences
 - Business
 - Humanities, Fine Arts, and Performing Arts
 - Social Sciences

See the [Breadth from Outside the Faculty of Science Course Lists](#) for eligible courses in each of the above categories. Courses taken to fulfill Major/Minor/Honors requirements may also be used to satisfy this breadth requirement.
3. **Breadth from Within the Faculty of Science:** Successful completion of a minimum of 9 units, with at least 3 units from each of the following categories:
 - Basic Sciences (i.e. common high school course offerings)
 - Formal Sciences (i.e. primarily numerical in nature or based in logic)
 - Specialized Sciences (i.e. uncommon high school course offerings)

See the [Breadth from Within the Faculty of Science Course Lists](#) for eligible courses in each of the above categories. Courses taken to fulfill Major/Minor/Honors requirements may also be used to satisfy this breadth requirement.
4. **Lab/Field Experience:** Successful completion of a minimum of 3 units in a science course that includes substantial and meaningful lab or field experience, where students are required to engage in the analysis and interpretation of authentic data or observations that reflect the uncertain nature of science. See the [Lab/Field Experience Course List](#) for eligible courses. Courses taken to fulfill Major/Minor/Honors requirements, or the Breadth from Within the Faculty of Science requirement, may also be used to satisfy the Lab/Field Experience requirement.
5. **Major/Minor/Honors:** Students in the Bachelor of Science (Major program) must declare a Major subject area, and may declare a Minor (in a different subject area). Students in certain subject areas may declare a second Major (in a different subject area, from a list of eligible subject areas). Students in the Bachelor of Science (Honors program) must declare an Honors subject area. They may declare a Minor (in a different subject area); they may not declare a second Major or Honors subject area. See the [Subject Areas](#) table below for a list of subject areas that may be declared, the available Major/Minor/Honors, the subject areas that are eligible for a Double Major, and exceptions to the Minor/Double Major combinations allowed. The requirements that must be completed for each Major/Minor/Honors can be found by selecting the respective subject area links in the table.

Some courses in certain subject areas may have prerequisites not included in the Major/Minor/Honors requirements. Students must plan accordingly to ensure these prerequisites are successfully completed (and included in the 120 units toward the degree) prior to attempting the associated Major/Minor/Honors course requirements.

Students completing a Major/Minor, Honors/Minor or Double Major combination must ensure they complete the requirements for both subject areas within 120 units, which may be difficult to do with certain combinations. Students are advised to consult with an Academic Advisor to ensure this requirement is met.

Minors from outside of the Faculty of Science must include at least 24 units. At least 6 units in 300- or 400-level courses must be taken while registered in the Faculty of Science at the University of Alberta. Students are responsible for meeting both the Faculty of Science Minor requirements and any outside Faculty or department-specified course requirements.

For regulations governing internal changes related to Major/Honors programs and/or subject areas, please see [Faculty of Science Regulations](#).

6. **Double-counted Courses:** Some courses may be listed in the requirements for more than one Major/Minor/Honors subject area.
 - There is no limit on how many 100- and 200-level courses can be double-counted in a Major/Minor, Honors/Minor, or Double Major combination.
 - For a Major/Minor or Honors/Minor combination, 300- and 400-level courses cannot be double-counted. Requirements at the 300 and 400 level must be satisfied separately; a 300- or 400-level course required by both subject areas may be credited toward only one subject area and must be substituted by an approved 300- or 400-level course for the other subject area. Students must consult an Academic Advisor for approved course substitutions.
 - For a Double Major, up to 6 units in 300- and 400-level courses can be double-counted. Any 300- or 400-level courses required by both subject areas beyond this 6 unit limit may be credited toward only one subject area and must be substituted by an approved 300- or 400-level course for the other subject area. Students must consult an Academic Advisor for approved course substitutions.

7. **Science Courses:** Successful completion of a minimum of 72 units in Science courses for credit to the degree. Students completing a Major or Honors in Planning, Mathematics and Economics, or Mathematics and Finance are only required to reach a minimum of 66 units in Science courses.

8. **Senior Courses:** Successful completion of a minimum of 78 units at the 200 level or higher (and therefore, a maximum of 42 units at the 100 level is permitted for credit to the degree). In addition, Major programs require the successful completion of a minimum of 36 units at the 300 level or higher and Honors programs require the successful completion of a minimum of 42 units at the 300 level or higher.

Subject Areas

Subject Areas Offered by the Faculty of Science:

	Honors	Major	Minor	Eligible for Double Major	Minor & Double Major Exceptions
Applied Mathematics	X	X		X	May not be combined with Mathematics (Major or Minor)
Astrophysics	X	X	X	X	May not be combined with Geophysics (Minor), Physics (Honors, Major or Minor)
Biochemistry	X	X	X	X	
Bioinformatics - Biological Sciences Focus			X		May not be combined with Biological Sciences (Honors or Major), Cell Biology (Honors or Major), EE&E Biology (Honors or Major), Immunology and Infection (Honors or Major), Integrative Physiology (Honors or Major), MC&D Biology (Honors or Major), Pharmacology (Honors or Major), Physiology (Honors or Major)
Bioinformatics - Computing Science Focus			X		May not be combined with Computing Science (Honors or Major), Computing Science - Software Practice (Honors or Major)
Biological Sciences	X	X	X	X	May not be combined with Bioinformatics - Biological Sciences Focus (Minor), EE&E Biology (Honors or Major), Integrative Physiology (Honors or Major), MC&D Biology (Honors or Major)
Cell Biology	X	X	X	X	May not be combined with Bioinformatics - Biological Sciences Focus (Minor)
Chemistry	X	X	X	X	

Calendar Change Request Form for Program and Regulation Changes

Climate Dynamics			X		
Computing Science	X	X	X	X	May not be combined with Bioinformatics - Computing Science Focus (Minor)
Computing Science - Software Practice Option	X	X			May not be combined with Bioinformatics - Computing Science Focus (Minor), Computing Science (Minor)
Earth Sciences	X	X	X	X	May not be combined with Environmental Earth Sciences (Honors or Major), Geology (Honors or Major)
Ecology, Evolution and Environmental Biology (EE&E Biology)	X	X		X	May not be combined with Bioinformatics - Biological Sciences Focus (Minor), Biological Sciences (Major or Minor), Integrative Physiology (Major), MC&D Biology (Major)
Environmental Earth Sciences	X	X			May not be combined with Earth Sciences (Minor)
Geology	X	X			May not be combined with Earth Sciences (Minor)
Geophysics	X	X	X		May not be combined with Astrophysics (Honors, Major or Minor), Physics (Honors, Major or Minor)
Immunology and Infection	X	X			May not be combined with Bioinformatics - Biological Sciences Focus (Minor), Biological Sciences (Minor)
Integrative Physiology	X	X		X	May not be combined with Bioinformatics - Biological Sciences Focus (Minor), Biological Sciences (Major or Minor), EE&E Biology (Major), MC&D Biology (Major)
Mathematical Physics	X	X			May not be combined with Astrophysics (Minor), Geophysics (Minor), Mathematics (Minor), Physics (Minor)
Mathematics	X	X	X	X	May not be combined with Applied Mathematics (Honors or Major)
Mathematics and Economics	X	X			May not be combined with Economics (Minor), Mathematics (Minor)
Mathematics and Finance	X	X			May not be combined with Business (Minor), Mathematics (Minor)
Molecular, Cellular and Developmental Biology (MC&D Biology)	X	X		X	May not be combined with Bioinformatics - Biological Sciences Focus (Minor), Biological Sciences (Major or Minor), EE&E Biology (Major), Integrative Physiology (Major)
Neuroscience	X	X			
Paleontology	X	X			May not be combined with Biological Sciences (Minor), Earth Sciences (Minor)
Pharmacology	X	X	X	X	May not be combined with Bioinformatics – Biological Sciences Focus (Minor)
Physics	X	X	X	X	May not be combined with Astrophysics (Honors, Major or Minor), Geophysics (Honors, Major or Minor)
Physiology	X	X			May not be combined with Bioinformatics – Biological Sciences Focus (Minor)
Planning	X	X			May not be combined with Human Geography (Minor)
Psychology	X	X	X	X	
Statistics	X	X	X	X	

Subject Areas Available from other Faculties:

	Honors	Major	Minor	Eligible for Double Major	Minor & Double Major Exceptions
Agriculture [ALES]			X		
Ancient and Medieval Studies [ARTS]			X		
Anthropology [ARTS]			X		
Art and Design [ARTS]			X		

Calendar Change Request Form for Program and Regulation Changes

Arts and Cultural Management [ARTS]			X		
Business [BUS]			X		May not be combined with Mathematics and Finance (Honors or Major)
Central/East European Studies [ARTS]			X		
Christian Theology [ARTS]			X		
Classics [ARTS]			X		
Comparative Literature [ARTS]			X		
Creative Writing [ARTS]			X		
Drama [ARTS]			X		
East Asian Studies [ARTS]			X		
Economics [ARTS]			X		May not be combined with Mathematics and Economics (Honors or Major)
English [ARTS]			X		
Film Studies [ARTS]			X		
French [ARTS]			X		
German [ARTS]			X		
History [ARTS]			X		
History of Art, Design, and Visual Culture [ARTS]			X		
Human Ecology [ALES]			X		
Human Geography [ARTS]			X		May not be combined with Planning (Honors or Major)
International Studies [ARTS]			X		
Italian Studies [ARTS]			X		
Latin American Studies [ARTS]			X		
Linguistics [ARTS]			X		
Music [ARTS]			X		
Native Studies [NS]			X		
Nutrition [ALES]			X		
Philosophy [ARTS]			X		
Polish [ARTS]			X		
Political Science [ARTS]			X		
Religious Studies [ARTS]			X		
Russian [ARTS]			X		
Scandinavian [ARTS]			X		
Science, Technology, and Society [ARTS]			X		
Sociology [ARTS]			X		
Spanish [ARTS]			X		
Ukrainian [ARTS]			X		
Ukrainian Folklore [ARTS]			X		

Women's and Gender Studies [ARTS]			X		
--------------------------------------	--	--	---	--	--

 [Return to: Faculty of Science](#)

Note Regarding Changes Proposed Below:

Each "Bachelor of Science XXX" section will be a separate/new page that opens when the corresponding green link above is clicked. Each "Honors in XXX", "Major in XXX" and "Minor in XXX" section will appear on the "Bachelor of Science XXX" page in the order/format shown. Clicking on the green link under "Requirements" will take the viewer to the appropriate section in-page.

Bachelor of Science Applied Mathematics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Applied Mathematics](#) (66 units)
- [Major in Applied Mathematics](#) (54 units)

Honors in Applied Mathematics Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#) (See Note 1)
- [CMPUT 175 - Introduction to the Foundations of Computation II](#) (See Note 1)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)
- [MATH 154 - Calculus for Business and Economics I](#)

3 units from

- [MATH 118 - Honors Calculus II](#)
- [MATH 136 - Calculus for the Life Sciences II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)
- [MATH 156 - Calculus for Business and Economics II](#)

3 units from

- [MATH 125 - Linear Algebra I](#)
- [MATH 127 - Honors Linear Algebra I](#)

Senior Courses

- [MATH 216 - Introduction to Analysis](#) (See Note 2)
- [MATH 217 - Honors Calculus III](#)
- [MATH 226 - Introduction to Abstract Algebra](#) (See Note 3)
- [MATH 317 - Honors Calculus IV](#)
- [MATH 336 - Honors Ordinary Differential Equations](#)
- [MATH 337 - Introduction to Partial Differential Equations](#)
- [MATH 381 - Numerical Methods](#)
- [MATH 411 - Honors Complex Variables](#)
- [MATH 417 - Introduction to Measure Theory](#)
- [MATH 436 - Intermediate Partial Differential Equations](#)
- [MATH 499 - Research Project](#)
- [STAT 265 - Introduction to Probability](#)

3 units from

- [MATH 225 - Linear Algebra II](#)
- [MATH 227 - Honors Linear Algebra II](#)

3 units from

- MA PH 364 - Group Theory in Physics
- MATH 327 - Algebra I

3 units from

-
- MATH 371 - Mathematical Modelling in the Life Sciences
 - MATH 372 - Mathematical Modelling

3 units from

-
- any 300- and 400-level MATH course
 - any 300- and 400-level MA PH course

3 units from

-
- any 400-level MATH course
 - any 400-level MA PH course

Notes

-
1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
 2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from MATH at the 200 level or higher.
 3. Students that complete MATH 127 and MATH 227 can replace MATH 226 with 3 units selected from any 200-, 300-, and 400-level MATH course.
 4. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
 5. Several of the required courses, including MATH 411, may only be offered in alternate years.
 6. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.

Major in Applied Mathematics Requirements

Foundation Courses

-
- CMPUT 174 - Introduction to the Foundations of Computation I (See Note 1)
 - CMPUT 175 - Introduction to the Foundations of Computation II (See Note 1)

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 134 - Calculus for the Life Sciences I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I
 - MATH 154 - Calculus for Business and Economics I

3 units from

-
- MATH 118 - Honors Calculus II
 - MATH 136 - Calculus for the Life Sciences II
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II
 - MATH 156 - Calculus for Business and Economics II

3 units from

-
- MATH 125 - Linear Algebra I
 - MATH 127 - Honors Linear Algebra I

Senior Courses

-
- MATH 216 - Introduction to Analysis (See Note 2)
 - MATH 336 - Honors Ordinary Differential Equations
 - MATH 381 - Numerical Methods

- STAT 265 - Introduction to Probability

3 units from

- MATH 214 - Calculus III
- MATH 217 - Honors Calculus III

3 units from

- MATH 225 - Linear Algebra II
- MATH 227 - Honors Linear Algebra II

3 units from

- MATH 315 – Calculus IV
- MATH 317 - Honors Calculus IV

3 units from

- MA PH 364 - Group Theory in Physics
- MATH 327 - Algebra I

3 units from

- MATH 334 - Ordinary Differential Equations
- MATH 336 - Honors Ordinary Differential Equations

3 units from

- MATH 371 - Mathematical Modelling in the Life Sciences
- MATH 372 - Mathematical Modelling

3 units from

- MATH 311 - Theory of Functions of a Complex Variable
- MATH 411 - Honors Complex Variables

6 units from

- any 400-level MATH course
- any 400-level MA PH course

Notes

1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
4. Several of the required courses, including MATH 411, may only be offered in alternate years.

Bachelor of Science Astrophysics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- Honors in Astrophysics (75 units)
- Major in Astrophysics (54 units)
- Minor in Astrophysics (24 units)

Honors in Astrophysics Requirements

Foundation Courses

- MATH 102 - Applied Linear Algebra
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- PHYS 144 - Newtonian Mechanics
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- ASTRO 320 - Stellar Astrophysics I
- ASTRO 322 - Galactic and Extragalactic Astrophysics
- MA PH 251 - Differential Equations for Physics
- MA PH 351 - Mathematical Methods for Physics I
- MATH 214 - Calculus III
- PHYS 234 - Introductory Computational Physics
- PHYS 244 - Classical Mechanics
- PHYS 271 - Introduction to Modern Physics
- PHYS 295 - Experimental Physics I
- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 311 - Statistical Physics
- PHYS 372 - Quantum Mechanics I
- PHYS 381 - Electromagnetism I
- PHYS 499 - Undergraduate Research Project

3 units from

- MA PH 343 - Classical Mechanics II
- PHYS 362 - Optical Physics

6 units from

- any 400-level ASTRO course

9 units from

- any 400-level ASTRO course
- PHYS 420 - Computational Physics
- PHYS 458 - Special and General Relativity
- PHYS 467 - Fundamentals of Continuum Mechanics
- PHYS 472 - Quantum Mechanics II
- PHYS 481 - Electromagnetism II
- PHYS 485 - Introductory Particle Physics

Notes

1. ASTRO 120 and ASTRO 122 are recommended as Science options.
2. Not all 200-, 300-, and 400-level Physics courses are offered every year so students should plan accordingly.
3. Students without a background in computer programming are strongly encouraged to take CMPUT 174 as one of their Science options in their first year.

Major in Astrophysics Requirements

Foundation Courses

- MATH 102 - Applied Linear Algebra
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- PHYS 144 - Newtonian Mechanics
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- ASTRO 320 - Stellar Astrophysics I
- ASTRO 322 - Galactic and Extragalactic Astrophysics
- MA PH 251 - Differential Equations for Physics
- MA PH 351 - Mathematical Methods for Physics I
- MATH 214 - Calculus III
- PHYS 244 - Classical Mechanics
- PHYS 271 - Introduction to Modern Physics

3 units from List A

- PHYS 234 - Introductory Computational Physics
- PHYS 295 - Experimental Physics I

3 units from List B

- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 381 - Electromagnetism I

6 units from List C

- MA PH 343 - Classical Mechanics II
- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 311 - Statistical Physics
- PHYS 362 - Optical Physics
- PHYS 372 - Quantum Mechanics I
- PHYS 381 - Electromagnetism I

3 units from List D

- ASTRO 429 - Upper Atmosphere and Space Physics
- ASTRO 465 - Stellar Astrophysics II

3 units from List E

- any 400-level ASTRO course
- PHYS 420 - Computational Physics
- PHYS 458 - Special and General Relativity
- PHYS 467 - Fundamentals of Continuum Mechanics
- PHYS 472 - Quantum Mechanics II
- PHYS 481 - Electromagnetism II

Notes

1. Note that some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
2. ASTRO 120 and ASTRO 122 are recommended as Science options.
3. Not all 200-, 300-, and 400-level Physics courses are offered every year so students should plan accordingly.
4. Students without a background in computer programming are strongly encouraged to take CMPUT 174 as one of their Science options in their first year.

Minor in Astrophysics Requirements

Foundation Courses

- [ASTRO 120 - Astronomy of the Solar System](#)

3 units from

- [ASTRO 101 - Black Holes](#)
- [ASTRO 122 - Astronomy of Stars and Galaxies](#)

3 units from

- [PHYS 124 - Particles and Waves](#)
- [PHYS 144 - Newtonian Mechanics](#)

3 units from

- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- [ASTRO 320 - Stellar Astrophysics I](#)
- [ASTRO 322 - Galactic and Extragalactic Astrophysics](#)

3 units from

- [PHYS 208 - Aspects of Modern Physics](#)
- [PHYS 271 - Introduction to Modern Physics](#)

3 units from

- [PHYS 234 - Introductory Computational Physics](#)
- [PHYS 294 - General Physics Laboratory](#)
- [PHYS 295 - Experimental Physics I](#)

Notes

1. Upper level ASTRO and PHYS courses may require specific MATH courses as prerequisites. These prerequisites must be considered when choosing Science options.

Bachelor of Science Biochemistry Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Biochemistry](#) (69 units)
- [Major in Biochemistry](#) (48 units)
- [Minor in Biochemistry](#) (24 units)

Honors in Biochemistry Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II

6 units from

- any 100-level course with the following course designators:
 - MATH
 - PHYS
 - STAT

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOCH 310 - Bioenergetics and Metabolism
- BIOCH 320 - Structure and Catalysis
- BIOCH 330 - Nucleic Acids and Molecular Biology
- BIOCH 499 - Directed Research Project
- CHEM 211 - Quantitative Analysis I
- CHEM 213 - Quantitative Analysis II
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

6 units from

- BIOCH 401 - Biochemistry Laboratory
- BIOCH 400 - Biochemistry Laboratory Part I **AND**
BIOCH 404 - Biochemistry Laboratory Part II

15 units from

- any 400-level BIOCH course

Notes

1. Students should consult the Department of Biochemistry for advice about course selection throughout the program. Several alternative course schedules are possible.

Major in Biochemistry Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II

3 units from

- any 100-level course with the following course designators:
 - MATH
 - PHYS
 - STAT

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOCH 310 - Bioenergetics and Metabolism
- BIOCH 320 - Structure and Catalysis
- BIOCH 330 - Nucleic Acids and Molecular Biology
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II

3 units from

-
- BIOL 201 - Eukaryotic Cellular Biology
 - CELL 201 - Introduction to Molecular Cell Biology

9 units from

-
- any 200-, 300- and 400-level course with the following course designators (with at least 3 units at the 300 level or higher):
 - BIOCH
 - BIOIN
 - BIOPH
 - BIOL
 - CELL
 - CHEM
 - CMPUT
 - GENET
 - IMIN
 - MATH
 - MICRB
 - ONCOL
 - PHYS
 - PHYSL
 - PMCOL
 - STAT

6 units from

-
- any 400-level BIOCH course

Notes

-
1. Students should consult the Department of Biochemistry for advice about course selection throughout the program. Several alternative course schedules are possible.

Minor in Biochemistry Requirements

Foundation Courses

-
- CHEM 101 - Introductory University Chemistry I
 - CHEM 102 - Introductory University Chemistry II

Senior Courses

-
- BIOCH 200 - Introductory Biochemistry
 - BIOCH 310 - Bioenergetics and Metabolism
 - BIOCH 320 - Structure and Catalysis
 - BIOCH 330 - Nucleic Acids and Molecular Biology
 - CHEM 261 - Organic Chemistry I
 - CHEM 263 - Organic Chemistry II

Bachelor of Science Bioinformatics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Bioinformatics - Biological Sciences Focus \(24 units\)](#)
- [Minor in Bioinformatics - Computing Science Focus \(24 units\)](#)

Minor in Bioinformatics - Biological Sciences Focus Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)

Senior Courses

- [BIOIN 301 - Bioinformatics I](#)
- [BIOIN 401 - Bioinformatics II](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)
- [GENET 270 - Foundations of Molecular Genetics](#)

6 units from

- [CMPUT 201 - Practical Programming Methodology](#)
- [CMPUT 204 - Algorithms I](#)
- [CMPUT 229 - Computer Organization and Architecture I](#)
- [CMPUT 272 - Formal Systems and Logic in Computing Science](#)
- [CMPUT 291 - Introduction to File and Database Management](#)
- [CMPUT 301 - Introduction to Software Engineering](#)
- [CMPUT 366 - Intelligent Systems](#)
- [CMPUT 391 - Database Management Systems](#)
- [CMPUT 410 - Web-Based Information Systems](#)
- [CMPUT 466 - Machine Learning](#)

Minor in Bioinformatics - Computing Science Focus Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#)
- [CMPUT 175 - Introduction to the Foundations of Computation II](#)

Senior Courses

- [BIOIN 301 - Bioinformatics I](#)
- [BIOIN 401 - Bioinformatics II](#)
- [CMPUT 201 - Practical Programming Methodology](#)
- [CMPUT 291 - Introduction to File and Database Management](#)
- [GENET 270 - Foundations of Molecular Genetics](#)

3 units from

- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 221 - Mechanisms of Evolution](#)

Notes

1. [CMPUT 274](#) can serve as a substitute for [CMPUT 174](#). [CMPUT 275](#) can serve as a substitute for [CMPUT 175](#) and [201](#).

Bachelor of Science Biological Sciences Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Biological Sciences](#) (69 units)
- [Major in Biological Sciences](#) (48 units)
- [Minor in Biological Sciences](#) (24 units)

Honors in Biological Sciences Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences](#) (See Note 1)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 208 - Principles of Ecology](#)
- [BIOL 221 - Mechanisms of Evolution](#)
- [BIOL 499 - Research Project](#)
- [CHEM 261 - Organic Chemistry I](#)

3 units from

- [Ecology, Evolution or Diversity List](#) (See Note 2)

3 units from

- [Genetics, Molecular Biology or Microbiology List](#) (See Note 2)

3 units from

- [Physiology, Cell Biology or Developmental Biology List](#) (See Note 2)

24 units from

- any 300- and 400-level Discipline course with the following course designators (with at least 9 units at the 400 level; see Note 3):
 - BIOCH
 - BIOIN
 - BIOL
 - BOT
 - CELL
 - ENT
 - GENET
 - IMIN
 - MA SC
 - MMI
 - MICRB
 - NEURO
 - PALEO
 - PHYSL

- PMCOL
- ZOOL

3 units from

-
- any 200-, 300- and 400-level course with the following course designators:
 - CHEM
 - CMPUT
 - EAS
 - MATH
 - PL SC
 - PHYS
 - REN R

Notes

-
1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
 2. BIOL 107, BIOL 108, BIOL 207, BIOL 208 and BIOL 221 may not be used to fulfill this program requirement.
 3. Students must complete at least 9 units in Discipline courses with a lab component (at the 200-, 300-, and 400-level; excluding BIOL 207, BIOL 208, BIOL 298, BIOL 299, BIOL 398, BIOL 399, BIOL 490, BIOL 498, BIOL 499, MMI 499 or equivalent, and other research or independent study courses).
 4. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Major in Biological Sciences Requirements

Foundation Courses

-
- BIOL 107 - Introduction to Cell Biology
 - BIOL 108 - Introduction to Biological Diversity
 - CHEM 101 - Introductory University Chemistry I
 - MATH 134 - Calculus for the Life Sciences (See Note 1)
 - STAT 151- Introduction to Applied Statistics I

Senior Courses

-
- BIOL 207 - Molecular Genetics and Heredity
 - BIOL 208 - Principles of Ecology

3 units from

-
- Ecology, Evolution or Diversity List (See Note 2)

3 units from

-
- Genetics, Molecular Biology or Microbiology List (See Note 2)

3 units from

-
- Physiology, Cell Biology or Developmental Biology List (See Note 2)

18 units from

-
- any 300- and 400-level Discipline course with the following course designators (with at least 6 units at the 400 level; See Note 3):
 - BIOCH
 - BIOIN
 - BIOL
 - BOT
 - CELL
 - ENT
 - GENET
 - IMIN
 - MA SC

- MMI
- MICRB
- NEURO
- PALEO
- PHYSL
- PMCOL
- ZOOL

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. BIOL 107, BIOL 108, BIOL 207 and BIOL 208 may not be used to fulfill this program requirement.
3. Students must complete at least 9 units in Discipline courses with a lab component (at the 200-, 300-, and 400-level; excluding BIOL 207, BIOL 208, BIOL 298, BIOL 299, BIOL 398, BIOL 399, BIOL 490, BIOL 498, BIOL 499, MMI 499 or equivalent, and other research or independent study courses).
4. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Minor in Biological Sciences Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity

Senior Courses

3 units from

- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology

3 units from

- Ecology, Evolution or Diversity List (See Note 1)

3 units from

- Genetics, Molecular Biology or Microbiology List (See Note 1)

3 units from

- Physiology, Cell Biology or Developmental Biology List (See Note 1)

6 units from

- any 300- and 400-level Discipline course with the following course designators:
 - BIOCH
 - BIOIN
 - BIOL
 - BOT
 - CELL
 - ENT
 - GENET
 - IMIN
 - MA SC
 - MMI
 - MICRB
 - NEURO
 - PALEO
 - PHYSL
 - PMCOL
 - ZOOL

Notes

1. BIOL 107, BIOL 108, BIOL 207 and BIOL 208 may not be used to fulfill this program requirement.

Bachelor of Science Cell Biology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Cell Biology](#) (72 units)
- [Major in Cell Biology](#) (51 units)
- [Minor in Cell Biology](#) (27 units)

Honors in Cell Biology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)
- [CELL 300 - Advanced Cell Biology I](#)
- [CELL 301 - Advanced Cell Biology II](#)
- [CELL 302 - Diversity of the Cell](#)
- [CELL 499 - Research Project](#)
- [CHEM 261 - Organic Chemistry I](#)
- [CHEM 263 - Organic Chemistry II](#)
- [GENET 270 - Foundations of Molecular Genetics](#)
- [MICRB 265 - General Microbiology](#)

3 units from

- [BIOL 201 - Eukaryotic Cellular Biology](#)
- [CELL 201 - Introduction to Molecular Cell Biology](#)

3 units from

- any 300- and 400-level BIOCH course (See Note 1)

3 units from

- any 400-level CELL course (excluding CELL 498; see Note 1)

15 units from

- any course with the following course designators (with at least 6 units at the 400 level and no more than 6 units at the 200 level):
 - any 400-level ANAT course
 - BIOCH (See Note 1)
 - CELL (See Note 1)

- GENET
- IMIN (see Note 1)
- MICRB
- any 300- and 400-level MMI course
- NEURO
- ONCOL
- PHYSL
- PMCOL

Notes

-
1. BIOCH 320, CELL 398, and IMIN 200 are recommended.

Major in Cell Biology Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- CELL 300 - Advanced Cell Biology I
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- GENET 270 - Foundations of Molecular Genetics

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

3 units from

- any 300- and 400-level CELL course (excluding CELL 398, CELL 498 and CELL 499)

3 units from

- any 400-level CELL course (excluding CELL 498 and CELL 499)

12 units from

- any course with the following course designators (with at least 3 units at the 400 level and no more than 3 units at the 200 level):
 - any 400-level ANAT course
 - BIOCH
 - CELL
 - GENET
 - IMIN (see Note 1)
 - MICRB
 - any 300- and 400-level MMI course
 - NEURO
 - ONCOL
 - PHYSL
 - PMCOL

Notes

-
1. IMIN 200 is recommended.

Minor in Cell Biology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)

3 units from

- [BIOL 201 - Eukaryotic Cellular Biology](#)
- [CELL 201 - Introduction to Molecular Cell Biology](#)

3 units from

- any 300- and 400-level CELL course (excluding CELL 398, CELL 498 and CELL 499)

3 units from

- any 400-level CELL course (excluding CELL 498 and CELL 499)

9 units from

- any course with the following course designators (with at least 6 units at the 300 level or higher):
 - any 400-level ANAT course
 - BIOCH
 - CELL
 - GENET
 - IMIN
 - MICRB
 - any 300- and 400-level MMI course
 - NEURO
 - ONCOL
 - PHYSL
 - PMCOL

Bachelor of Science Chemistry Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Chemistry](#) (72 units)
- [Major in Chemistry](#) (60 units)
- [Minor in Chemistry](#) (24 units)

Honors in Chemistry Requirements

Foundation Courses

- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)

- MATH 125 - Linear Algebra I

3 units from

- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I

3 units from

- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II

3 units from

- PHYS 124 - Particles and Waves
- PHYS 144 - Newtonian Mechanics

3 units from

- PHYS 126 - Fluids, Fields, and Radiation
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- CHEM 211 - Quantitative Analysis I
- CHEM 213 - Quantitative Analysis II
- CHEM 241 - Introduction to Inorganic Chemistry
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- CHEM 282 - Atomic and Molecular Structure
- CHEM 313 - Instrumentation in Chemical Analysis
- CHEM 361 - Organic Chemistry
- CHEM 371 - Energetics of Chemical Reactions

3 units from

- CHEM 333 - Inorganic Materials Chemistry
- CHEM 343 - Advanced Inorganic Chemistry

6 units from

- CHEM 401 - Introduction to Chemical Research
- CHEM 403 - Chemical Research
- CHEM 499 - Advanced Chemical Research and Training

3 units from

- any 300-level BIOCH course
- any 300-level CHEM course

9 units from

- any 400-level CHEM course

Notes

1. The Honors in Chemistry degree program is accredited by the Canadian Society for Chemistry.

Major in Chemistry Requirements

Foundation Courses

- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II

3 units from

-
- MATH 134 - Calculus for the Life Sciences I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I

3 units from

-
- MATH 136 - Calculus for the Life Sciences II
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II

3 units from

-
- PHYS 124 - Particles and Waves
 - PHYS 144 - Newtonian Mechanics

3 units from

-
- PHYS 126 - Fluids, Fields, and Radiation
 - PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

-
- BIOCH 200 - Introductory Biochemistry
 - CHEM 211 - Quantitative Analysis I
 - CHEM 213 - Quantitative Analysis II
 - CHEM 241 - Introduction to Inorganic Chemistry
 - CHEM 261 - Organic Chemistry I
 - CHEM 263 - Organic Chemistry II

3 units from

-
- CHEM 282 - Atomic and Molecular Structure
 - CHEM 371 - Energetics of Chemical Reactions

15 units from List B

-
- any of the following courses (with no more than 6 units total from CHEM 299, CHEM 399, CHEM 401, CHEM 403, and CHEM 499):
 - CHEM 299 - Research Opportunity Program in Chemistry
 - CHEM 282 - Atomic and Molecular Structure
 - CHEM 305 - Environmental Chemistry II
 - CHEM 313 - Instrumentation in Chemical Analysis
 - CHEM 333 - Inorganic Materials Chemistry
 - CHEM 343 - Advanced Inorganic Chemistry
 - CHEM 361 - Organic Chemistry
 - CHEM 371 - Energetics of Chemical Reactions
 - CHEM 373 - Physical Properties and Dynamics of Chemical Systems
 - CHEM 398 - Molecular Spectroscopy
 - CHEM 399 - Research Experience in Chemistry
 - CHEM 401 - Introduction to Chemical Research
 - CHEM 403 - Chemical Research
 - CHEM 460 - Contemporary Organic Chemistry
 - CHEM 461 - Qualitative Organic Analysis
 - CHEM 499 - Advanced Chemical Research and Training

6 units from

-
- any 400-level CHEM course

Notes

-
1. Some courses appear in more than one requirement. Students may not use the same course to satisfy more than one requirement.

2. CHEM 299 can be taken twice; CHEM 399 can be taken up to four times.
3. The Major in Chemistry degree program is accredited by the Canadian Society for Chemistry.

Minor in Chemistry Requirements

Foundation Courses

- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II

Senior Courses

- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II

3 units from

- CHEM 211 - Quantitative Analysis I
- CHEM 241 - Introduction to Inorganic Chemistry
- CHEM 382 - Atomic and Molecular Structure

3 units from

- any 200-, 300-, and 400-level course with the following course designators:
 - BIOCH
 - CHEM

6 units from

- any 300- and 400-level CHEM course

Bachelor of Science Climate Dynamics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Climate Dynamics](#) (30 units)

Minor in Climate Dynamics Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I
- EAS 100 - Planet Earth
- PHYS 144 - Newtonian Mechanics

3 units from

- MATH 117 - Honors Calculus I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I

Senior Courses

- [EAS 212 - The Oceans](#)

- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 270 - The Atmosphere

3 units from

- EAS 370 - Applied Atmospheric Physics
- EAS 371 - Dynamics of the Atmosphere and Ocean I

3 units from

- any 200-level EAS course

3 units from

- any 300- and 400-level EAS course

Bachelor of Science Computing Science Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- Honors in Computing Science (72 units)
- Honors in Computing Science - Software Practice Option (93 units)
- Major in Computing Science (54 units)
- Major in Computing Science - Software Practice Option (78 units)
- Minor in Computing Science (24 units)

Honors in Computing Science Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I
- CMPUT 175 - Introduction to the Foundations of Computation II

3 units from

- MATH 117 - Honors Calculus I
- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 118 - Honors Calculus II
- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- MATH 156 - Calculus for Business and Economics II

3 units from

- MATH 125 - Linear Algebra I
- MATH 127 - Honors Linear Algebra I

3 units from

- STAT 151 - Introduction to Applied Statistics I
- STAT 235 - Introductory Statistics for Engineering
- STAT 265 - Introduction to Probability

Senior Courses

- CMPUT 201 - Practical Programming Methodology
- CMPUT 204 - Algorithms I
- CMPUT 229 - Computer Organization and Architecture I
- CMPUT 272 - Formal Systems and Logic in Computing Science
- CMPUT 291 - Introduction to File and Database Management

3 units from

- CMPUT 200 - Ethics of Data Science and Artificial Intelligence
- CMPUT 300 - Computers and Society

3 units from

- CMPUT 399 - Topics in Computing Science (See Note 2)
- CMPUT 401 - Software Process and Product Management
- CMPUT 403 - Practical Algorithms
- CMPUT 469 - Artificial Intelligence Capstone
- CMPUT 499 - Topics in Computing Science

3 units from

- STAT 252 - Introduction to Applied Statistics II
- STAT 266 - Introduction to Statistics

18 units from

- any 300- and 400-level CMPUT course

12 units from

- any 400-level CMPUT course

Notes

2. CMPUT 274 can serve as a substitute for CMPUT 174. CMPUT 275 can serve as a substitute for CMPUT 175 and 201.
3. If CMPUT 399 is taken, at least 3 units of the 18 units from any 300- and 400-level CMPUT course requirement must be at the 400 level.
4. Upper level CMPUT courses may require specific CMPUT, MATH or STAT courses as prerequisites. These prerequisites must be considered when choosing Science options.

Honors in Computing Science - Software Practice Option Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I
- CMPUT 175 - Introduction to the Foundations of Computation II

3 units from

- MATH 117 - Honors Calculus I
- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 118 - Honors Calculus II
- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- MATH 156 - Calculus for Business and Economics I

3 units from

- MATH 125 - Linear Algebra I
- MATH 127 - Honors Linear Algebra I

3 units from

- STAT 151 - Introduction to Applied Statistics I
- STAT 235 - Introductory Statistics for Engineering
- STAT 265 - Introduction to Probability

Senior Courses

- CMPUT 201 - Practical Programming Methodology
- CMPUT 204 - Algorithms I
- CMPUT 229 - Computer Organization and Architecture I
- CMPUT 272 - Formal Systems and Logic in Computing Science
- CMPUT 291 - Introduction to File and Database Management
- CMPUT 301 - Introduction to Software Engineering
- CMPUT 325 - Non-Procedural Programming Languages
- CMPUT 379 - Operating System Concepts
- CMPUT 401 - Software Process and Product Management
- CMPUT 402 - Software Quality

3 units from

- STAT 252 - Introduction to Applied Statistics II
- STAT 266 - Introduction to Statistics

3 units from

- CMPUT 200 - Ethics of Data Science and Artificial Intelligence
- CMPUT 300 - Computers and Society

3 units from

- CMPUT 304 - Algorithms II
- CMPUT 340 - Introduction to Numerical Methods
- CMPUT 474 - Formal Languages, Automata, and Computability

3 units from

- CMPUT 399 - Topics in Computing Science
- CMPUT 401 - Software Process and Product Management
- CMPUT 403 - Practical Algorithms
- CMPUT 469 - Artificial Intelligence Capstone
- CMPUT 499 - Topics in Computing Science

12 units from

- any 300- and 400-level CMPUT course

9 units from

- any 400-level CMPUT course (up to 3 units can be at the 300-level if CMPUT 474 taken above)

12 units from

- any course offered by the Faculty of Business (with the exception of BTM 311, BTM 415, BTM 419, and MGTSC 312); must include 6 units in courses with the following course designators:
 - BTM
 - MGTSC
 - OM

8-, 12-, or 16-month Science Internship (SIP)

- Students who fail to complete a placement in the SIP must withdraw from the program and reapply to continue in the Honors in Computing Science or Major in Computing Science programs.
- See [Science Internship Program](#) for more information.

Notes

1. CMPUT 274 can serve as a substitute for CMPUT 174. CMPUT 275 can serve as a substitute for CMPUT 175 and 201.
2. Upper level CMPUT courses may require specific CMPUT, MATH or STAT courses as prerequisites. These prerequisites must be considered when choosing Science options.

Major in Computing Science Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#)
- [CMPUT 175 - Introduction to the Foundations of Computation II](#)
- [MATH 125 - Linear Algebra I](#)

3 units from

- [MATH 134 - Calculus for the Life Sciences I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)
- [MATH 154 - Calculus for Business and Economics I](#)

3 units from

- [MATH 136 - Calculus for the Life Sciences II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)
- [MATH 156 - Calculus for Business and Economics I](#)

3 units from

- [STAT 151 - Introduction to Applied Statistics I](#)
- [STAT 235 - Introductory Statistics for Engineering](#)
- [STAT 265 - Introduction to Probability](#)

Senior Courses

6 units from

- [CMPUT 201 - Practical Programming Methodology](#)
- [CMPUT 204 - Algorithms I](#)
- [CMPUT 229 - Computer Organization and Architecture I](#)
- [CMPUT 272 - Formal Systems and Logic in Computing Science](#)
- [CMPUT 291 - Introduction to File and Database Management](#)

3 units from

- [CMPUT 200 - Ethics of Data Science and Artificial Intelligence](#)
- [CMPUT 300 - Computers and Society](#)

3 units from

- [STAT 252 - Introduction to Applied Statistics II](#)

- STAT 266 - Introduction to Statistics

18 units from

- any 300- and 400-level CMPUT course

6 units from

- any 400-level CMPUT course

Notes

1. CMPUT 274 can serve as a substitute for CMPUT 174. CMPUT 275 can serve as a substitute for CMPUT 175 and 201.
2. Upper level CMPUT courses may require specific CMPUT, MATH or STAT courses as prerequisites. These prerequisites must be considered when choosing Science options.

Major in Computing Science - Software Practice Option Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I
- CMPUT 175 - Introduction to the Foundations of Computation II
- MATH 125 - Linear Algebra I

3 units from

- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- MATH 156 - Calculus for Business and Economics I

3 units from

- STAT 151 - Introduction to Applied Statistics I
- STAT 235 - Introductory Statistics for Engineering
- STAT 265 - Introduction to Probability

Senior Courses

- CMPUT 201 - Practical Programming Methodology
- CMPUT 204 - Algorithms I
- CMPUT 229 - Computer Organization and Architecture I
- CMPUT 272 - Formal Systems and Logic in Computing Science
- CMPUT 291 - Introduction to File and Database Management
-
- CMPUT 301 - Introduction to Software Engineering
- CMPUT 325 - Non-Procedural Programming Languages
- CMPUT 379 - Operating System Concepts
- CMPUT 401 - Software Process and Product Management
- CMPUT 402 - Software Quality

3 units from

- STAT 252 - Introduction to Applied Statistics II
- STAT 266 - Introduction to Statistics

3 units from

- [CMPUT 200 - Ethics of Data Science and Artificial Intelligence](#)
- [CMPUT 300 - Computers and Society](#)

3 units from

-
- [CMPUT 304 - Algorithms II](#)
 - [CMPUT 340 - Introduction to Numerical Methods](#)
 - [CMPUT 474 - Formal Languages, Automata, and Computability](#)

6 units from

-
- any 300- and 400-level CMPUT course

3 units from

-
- any 400-level CMPUT course (can be at the 300-level if CMPUT 474 taken above)

12 units from

-
- any course offered by the Faculty of Business (with the exception of BTM 311, BTM 415, BTM 419, and MGTSC 312); must include 6 units in courses with the following course designators:
 - BTM
 - MGTSC
 - OM

8-, 12-, or 16-month Science Internship (SIP)

-
- Students who fail to complete a placement in the SIP must withdraw from the program and reapply to continue in the Major in Computing Science program.
 - See [Science Internship Program](#) for more information.

Notes

-
1. CMPUT 274 can serve as a substitute for CMPUT 174. CMPUT 275 can serve as a substitute for CMPUT 175 and 201.
 2. Upper level CMPUT courses may require specific CMPUT, MATH or STAT courses as prerequisites. These prerequisites must be considered when choosing Science options.

Minor in Computing Science Requirements

Foundation Courses

-
- [CMPUT 174 - Introduction to the Foundations of Computation I](#)
 - [CMPUT 175 - Introduction to the Foundations of Computation II](#)

Senior Courses

6 units from

-
- [CMPUT 201 - Practical Programming Methodology](#)
 - [CMPUT 204 - Algorithms I](#)
 - [CMPUT 229 - Computer Organization and Architecture I](#)
 - [CMPUT 272 - Formal Systems and Logic in Computing Science](#)
 - [CMPUT 291 - Introduction to File and Database Management](#)

6 units from

-
- any 200-, 300-, and 400-level CMPUT course

6 units from

-
- any 300- and 400-level CMPUT course

Notes

- Higher level CMPUT courses may require specific CMPUT, MATH or STAT courses as prerequisites. Therefore, prerequisites for higher level CMPUT courses must be considered when choosing options.

Bachelor of Science Earth Sciences Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Earth Sciences](#) (66 units)
- [Major in Earth Sciences](#) (54 units)
- [Minor in Earth Sciences](#) (30 units)

Honors in Earth Sciences Requirements

Foundation Courses

- [CHEM 101 - Introductory University Chemistry I](#)
- [EAS 100 - Planet Earth](#)
- [EAS 105 - The Dynamic Earth Through Time](#)
- [HGEO 100 - Introduction to Human Geography and Planning](#)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)

3 units from

- [PHYS 124 - Particles and Waves](#)
- [PHYS 144 - Newtonian Mechanics](#)

3 units from

- [CHEM 102 - Introductory University Chemistry II](#)
- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- [EAS 426 - Undergraduate Thesis](#)

12 units from

- any of the following courses:
 - [EAS 212 - The Oceans](#)
 - [EAS 221 - Introduction to Geographical Information Systems and Remote Sensing](#)
 - [EAS 222 - Stratigraphy and Sedimentation](#)
 - [EAS 224 - Mineralogy I](#)
 - [EAS 225 - Earth Surface Processes and Landforms](#)
 - [EAS 230 - Introduction to Invertebrate Paleontology](#)
 - [EAS 232 - Mineralogy II](#)
 - [EAS 233 - Geologic Structures](#)
 - [EAS 234 - Geology Field School](#)
 - [EAS 237 - Geological Field Techniques](#)

- EAS 250 - Biogeography
- EAS 270 - The Atmosphere

3 units from

-
- any 200-, 300-, and 400-level course with the following course designators:
 - EAS
 - HGEO
 - PALEO
 - PLAN

15 units from

-
- any 300- and 400-level EAS course

9 units from

-
- any 400-level EAS course

Notes

-
1. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Major in Earth Sciences Requirements

Foundation Courses

-
- CHEM 101 - Introductory University Chemistry I
 - EAS 100 - Planet Earth
 - EAS 105 - The Dynamic Earth Through Time
 - HGEO 100 - Introduction to Human Geography and Planning

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I

3 units from

-
- PHYS 124 - Particles and Waves
 - PHYS 144 - Newtonian Mechanics

3 units from

-
- CHEM 102 - Introductory University Chemistry II
 - PHYS 126 - Fluids, Fields, and Radiation
 - PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

12 units from

-
- any of the following courses:
 - EAS 212 - The Oceans
 - EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
 - EAS 222 - Stratigraphy and Sedimentation
 - EAS 224 - Mineralogy I
 - EAS 225 - Earth Surface Processes and Landforms

- EAS 230 - Introduction to Invertebrate Paleontology
- EAS 232 - Mineralogy II
- EAS 233 - Geologic Structures
- EAS 234 - Geology Field School
- EAS 237 - Geological Field Techniques
- EAS 250 - Biogeography
- EAS 270 - The Atmosphere

3 units from

-
- any 200-, 300-, and 400-level course with the following course designators:
 - EAS
 - HGEO
 - PALEO
 - PLAN

12 units from

-
- any 300- and 400-level EAS course

6 units from

-
- any 400-level EAS course

Notes

-
1. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Minor in Earth Sciences Requirements

Foundation Courses

-
- EAS 100 - Planet Earth
 - EAS 105 - The Dynamic Earth Through Time
 - HGEO 100 - Introduction to Human Geography and Planning

Senior Courses

12 units from

-
- any of the following courses (with no more than 3 units in GEOPH):
 - EAS 212 - The Oceans
 - EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
 - EAS 222 - Stratigraphy and Sedimentation
 - EAS 224 - Mineralogy I
 - EAS 225 - Earth Surface Processes and Landforms
 - EAS 230 - Introduction to Invertebrate Paleontology
 - EAS 232 - Mineralogy II
 - EAS 233 - Geologic Structures
 - EAS 234 - Geology Field School
 - EAS 237 - Geological Field Techniques
 - EAS 250 - Biogeography
 - EAS 270 - The Atmosphere
 - any 200-level GEOPH course

3 units from

-
- any 200-, 300-, and 400-level course with the following course designators:

- EAS
- HGEO
- PALEO
- PLAN

6 units from

- any 300- and 400-level EAS course

Bachelor of Science Ecology, Evolution and Environmental Biology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Ecology, Evolution and Environmental Biology](#) (72 units)
- [Major in Ecology, Evolution and Environmental Biology](#) (54 units)

Honors in Ecology, Evolution and Environmental Biology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences](#) (See Note 1)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 208 - Principles of Ecology](#)
- [BIOL 221 - Mechanisms of Evolution](#)
- [CHEM 261 - Organic Chemistry I](#)

6 units from

- [BIOL 499 - Research Project](#)
- [EAS 426 - Undergraduate Thesis](#)

6 units from

- any 300- and 400-level course in [EE&E List A](#)

3 units from

- any course in [EE&E List B](#)

3 units from

- any course in [EE&E List A](#) and [EE&E List B](#)

3 units from

- any 300- and 400-level course in [EE&E List C](#)

3 units from

- any 300- and 400-level course in [EE&E List D](#)

15 units from

- any 300- and 400-level course in [EE&E List C](#) and [EE&E List D](#) (with at least 9 units at the 400 level)

6 units from

- any 300- and 400-level course in [EE&E List E](#)

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Major in Ecology, Evolution and Environmental Biology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences \(See Note 1\)](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 208 - Principles of Ecology](#)
- [BIOL 221 - Mechanisms of Evolution](#)
- [CHEM 261 - Organic Chemistry I](#)

3 units from

- any 300- and 400-level course in [EE&E List A](#)

3 units from

- any course in [EE&E List B](#)

3 units from

- any course in [EE&E List A](#) and [EE&E List B](#)

3 units from

- any 300- and 400-level course in [EE&E List C](#)

3 units from

- any 300- and 400-level course in [EE&E List D](#)

9 units from

- any 300- and 400-level course in [EE&E List C](#) and [EE&E List D](#) (with at least 6 units at the 400 level)

3 units from

- any 300- and 400-level course in [EE&E List E](#)

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Bachelor of Science Environmental Earth Sciences Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Environmental Earth Sciences](#) (99 units)
- [Major in Environmental Earth Sciences](#) (87 units)

Honors in Environmental Earth Sciences Requirements

Foundation Courses

- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)
- [EAS 100 - Planet Earth](#)
- [EAS 105 - The Dynamic Earth Through Time](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)

3 units from

- [MATH 118 - Honors Calculus II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)

3 units from

- [PHYS 124 - Particles and Waves](#)
- [PHYS 144 - Newtonian Mechanics](#)

3 units from

- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- BIOL 208 - Principles of Ecology
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 222 - Stratigraphy and Sedimentation
- EAS 224 - Mineralogy I
- EAS 225 - Earth Surface Processes and Landforms
- EAS 233 - Geologic Structures
- EAS 234 - Geology Field School
- EAS 250 - Biogeography
- EAS 320 - Geochemistry I
- EAS 323 - Introduction to Hydrogeology
- EAS 324 - Quaternary Geoscience and Terrain Analysis
- EAS 354 - Environmental Earth Science Field School
- EAS 426 - Undergraduate Thesis
- EAS 457 - Global Change
- EAS 458 - Cold Regions Geoscience (See Note 1)
- GEOPH 223 - Environmental Geophysics
- HGEO 250 - Sustainable Development and Environmental Management

3 units from

-
- EAS 212 - The Oceans
 - EAS 270 - The Atmosphere

3 units from

-
- EAS 327 - Environmental Instrumentation
 - EAS 351 - Environmental Applications of Geographical Information Systems
 - EAS 451 - Digital Remote Sensing

3 units from

-
- EAS 425 - Contaminant Hydrogeology
 - EAS 468 - Geochemical Processes

3 units from

-
- any 300- and 400-level EAS course

3 units from

-
- any 400-level EAS course (can be 300-level if EAS 451 taken above)

Notes

-
1. EAS 458 may be taken more than once for credit.
 2. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Major in Environmental Earth Sciences Requirements

Foundation Courses

-
- BIOL 108 - Introduction to Biological Diversity
 - CHEM 101 - Introductory University Chemistry I
 - CHEM 102 - Introductory University Chemistry II
 - EAS 100 - Planet Earth
 - EAS 105 - The Dynamic Earth Through Time
 - STAT 151 - Introduction to Applied Statistics I

3 units from

- MATH 117 - Honors Calculus I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I

3 units from

- MATH 118 - Honors Calculus II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II

3 units from

- PHYS 124 - Particles and Waves
- PHYS 144 - Newtonian Mechanics

3 units from

- PHYS 126 - Fluids, Fields, and Radiation
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- BIOL 208 - Principles of Ecology
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 222 - Stratigraphy and Sedimentation
- EAS 224 - Mineralogy I
- EAS 225 - Earth Surface Processes and Landforms
- EAS 233 - Geologic Structures
- EAS 234 - Geology Field School
- EAS 250 - Biogeography
- EAS 320 - Geochemistry I
- EAS 323 - Introduction to Hydrogeology
- EAS 324 - Quaternary Geoscience and Terrain Analysis
- EAS 354 - Environmental Earth Science Field School
- EAS 457 - Global Change
- EAS 458 - Cold Regions Geoscience (See Note 1)
- GEOPH 223 - Environmental Geophysics
- HGEO 250 - Sustainable Development and Environmental Management

3 units from

- EAS 212 - The Oceans
- EAS 270 - The Atmosphere

3 units from

- EAS 327 - Environmental Instrumentation
- EAS 351 - Environmental Applications of Geographical Information Systems
- EAS 451 - Digital Remote Sensing

3 units from

- EAS 425 - Contaminant Hydrogeology
- EAS 468 - Geochemical Processes

Notes

1. EAS 458 may be taken more than once for credit.
2. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Bachelor of Science Geology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Geology](#) (93 units)
- [Major in Geology](#) (84 units)

Honors in Geology Requirements

Foundation Courses

- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)
- [EAS 100 - Planet Earth](#)
- [EAS 105 - The Dynamic Earth Through Time](#)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)

3 units from

- [MATH 118 - Honors Calculus II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)

3 units from

- [PHYS 124 - Particles and Waves](#)
- [PHYS 144 - Newtonian Mechanics](#)

3 units from

- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- [EAS 221 - Introduction to Geographical Information Systems and Remote Sensing](#)
- [EAS 222 - Stratigraphy and Sedimentation](#)
- [EAS 224 - Mineralogy I](#)
- [EAS 225 - Earth Surface Processes and Landforms](#)
- [EAS 230 - Introduction to Invertebrate Paleontology](#)
- [EAS 232 - Mineralogy II](#)
- [EAS 233 - Geologic Structures](#)
- [EAS 234 - Geology Field School](#)
- [EAS 320 - Geochemistry I](#)
- [EAS 323 - Introduction to Hydrogeology](#)
- [EAS 331 - Igneous Petrology](#)
- [EAS 332 - Metamorphic Petrology](#)
- [EAS 333 - Advanced Geology Field School](#)
- [EAS 336 - Sedimentary Systems](#)
- [EAS 426 - Undergraduate Thesis](#)

3 units from

- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 368 - Ore Deposits Geology

6 units from

-
- GEOPH 210 - Physics of the Earth
 - GEOPH 223 - Environmental Geophysics
 - GEOPH 224 - Geophysical Exploration Techniques

12 units from

-
- any 400-level EAS course

Notes

-
1. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Major in Geology Requirements

Foundation Courses

-
- CHEM 101 - Introductory University Chemistry I
 - CHEM 102 - Introductory University Chemistry II
 - EAS 100 - Planet Earth
 - EAS 105 - The Dynamic Earth Through Time

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I

3 units from

-
- MATH 118 - Honors Calculus II
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II

3 units from

-
- PHYS 124 - Particles and Waves
 - PHYS 144 - Newtonian Mechanics

3 units from

-
- PHYS 126 - Fluids, Fields, and Radiation
 - PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

-
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
 - EAS 222 - Stratigraphy and Sedimentation
 - EAS 224 - Mineralogy I
 - EAS 225 - Earth Surface Processes and Landforms
 - EAS 230 - Introduction to Invertebrate Paleontology
 - EAS 232 - Mineralogy II
 - EAS 233 - Geologic Structures
 - EAS 234 - Geology Field School
 - EAS 320 - Geochemistry I
 - EAS 323 - Introduction to Hydrogeology
 - EAS 331 - Igneous Petrology
 - EAS 332 - Metamorphic Petrology

- EAS 333 - Advanced Geology Field School
- EAS 336 - Sedimentary Systems

3 units from

- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 368 - Ore Deposits Geology

6 units from

- GEOPH 210 - Physics of the Earth
- GEOPH 223 - Environmental Geophysics
- GEOPH 224 - Geophysical Exploration Techniques

9 units from

- any 400-level EAS course

Notes

1. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.

Bachelor of Science Geophysics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- Honors in Geophysics (90 units)
- Major in Geophysics (81 units)
- Minor in Geophysics (24 units)

Honors in Geophysics Requirements

Foundation Courses

- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- EAS 105 - The Dynamic Earth Through Time
- GEOPH 110 - Introduction to Geophysics (See Note 1)
- MATH 102 - Applied Linear Algebra
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- PHYS 144 - Newtonian Mechanics
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- EAS 222 - Stratigraphy and Sedimentation
- EAS 233 - Geologic Structures
- GEOPH 325 - Gravity, Magnetic, and Electrical Geophysics
- GEOPH 326 - Seismic Imaging
- GEOPH 421 - Seismology and the Physical Structure of the Earth

- GEOPH 424 - Electromagnetic Methods in Geophysics
- GEOPH 426 - Signal Processing in Geophysics
- GEOPH 436 - Geophysics Field School
- GEOPH 438 - Seismic Data Processing
- MA PH 251 - Differential Equations for Physics
- MA PH 351 - Mathematical Methods for Physics I
- MATH 214 - Calculus III
- PHYS 234 - Introductory Computational Physics
- PHYS 244 - Classical Mechanics
- PHYS 381 - Electromagnetism I
- PHYS 499 - Undergraduate Research Project

15 units from

- any of the following courses (with at least 6 units at the 400 level):
 - AREC 313 - Statistical Analysis
 - AREC 365 - Natural Resource Economics
 - ASTRO 429 - Upper Atmosphere and Space Physics
 - CH E 243 - Engineering Thermodynamics
 - CIV E 250 - Plane Surveying
 - CIV E 381 - Soil Mechanics
 - CMPUT 267 - Basics of Machine Learning
 - CMPUT 466 - Machine Learning
 - CMPUT 481 - Parallel and Distributed Systems
 - GEOPH 332 - Physical Properties of Geomaterials
 - GEOPH 431 - Geophysical Inverse Theory
 - GEOPH 440 - Global Geodynamics
 - EAS 209 - Geology of Western Canada and the National and Provincial Parks
 - EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
 - EAS 224 - Mineralogy I
 - EAS 270 - The Atmosphere
 - EAS 320 - Geochemistry I
 - EAS 323 - Introduction to Hydrogeology
 - EAS 324 - Quaternary Geoscience and Terrain Analysis
 - EAS 421 - Structural Geology and Tectonics
 - EAS 422 - Structural Interpretation of Sedimentary Basins
 - EAS 425 - Contaminant Hydrogeology
 - EAS 456 - Hydrologic Modeling
 - ECE 209 - Fundamentals of Electrical Engineering
 - MIN E 295 - Introduction to Mining Engineering
 - MIN E 323 - Rock Mechanics
 - PET E 365 - Well Logging and Formation Evaluation
 - PHYS 261 - Physics of Energy
 - PHYS 271 - Introduction to Modern Physics
 - PHYS 308 - Statistical, Molecular, and Solid State Physics
 - PHYS 310 - Thermodynamics and Kinetic Theory
 - PHYS 362 - Optical Physics
 - PHYS 420 - Computational Physics
 - PHYS 467 - Fundamentals of Continuum Mechanics
 - PHYS 481 - Electromagnetism II
 - STAT 235 - Introductory Statistics for Engineering

Notes

1. Students entering the Honors Geophysics program after first year may take GEOPH 210 in lieu of GEOPH 110. However, students will not receive credit for both GEOPH 110 and GEOPH 210.
2. Not all 200-, 300- and 400-level Physics courses are offered every year so students should plan accordingly.
3. Students without a background in computer programming are strongly encouraged to take CMPUT 174 as one of their Science Options in their first year.
4. Students in Geophysics will not have the formal prerequisites for many of the AREC, CH E, CIV E, CMPUT, EAS, ECE, MIN E, and PET E courses, and must request permission to register in those courses from the department offering the particular course.
5. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an Geophysics

program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Physics or APEGA. Full information is available at www.apega.ca.

Major in Geophysics Requirements

Foundation Courses

- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- EAS 105 - The Dynamic Earth Through Time
- GEOPH 110 - Introduction to Geophysics (See Note 1)
- MATH 102 - Applied Linear Algebra
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- PHYS 144 - Newtonian Mechanics
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

- EAS 222 - Stratigraphy and Sedimentation
- EAS 233 - Geologic Structures
- GEOPH 325 - Gravity, Magnetic, and Electrical Geophysics
- GEOPH 326 - Seismic Imaging
- GEOPH 424 - Electromagnetic Methods in Geophysics
- GEOPH 426 - Signal Processing in Geophysics
- GEOPH 436 - Geophysics Field School
- GEOPH 438 - Seismic Data Processing
- MA PH 251 - Differential Equations for Physics
- MA PH 351 - Mathematical Methods for Physics I
- MATH 214 - Calculus III
- PHYS 234 - Introductory Computational Physics
- PHYS 244 - Classical Mechanics
- PHYS 381 - Electromagnetism I

3 units from

- GEOPH 332 - Physical Properties of Geomaterials
- GEOPH 421 - Seismology and the Physical Structure of the Earth
- GEOPH 440 - Global Geodynamics
- EAS 209 - Geology of Western Canada and the National and Provincial Parks
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 224 - Mineralogy I
- EAS 320 - Geochemistry I
- EAS 323 - Introduction to Hydrogeology
- PHYS 271 - Introduction to Modern Physics
- PHYS 308 - Statistical, Molecular, and Solid State Physics
- PHYS 499 - Undergraduate Research Project

9 units from

- AREC 313 - Statistical Analysis
- AREC 365 - Natural Resource Economics
- ASTRO 429 - Upper Atmosphere and Space Physics
- CH E 243 - Engineering Thermodynamics
- CIV E 250 - Plane Surveying
- CIV E 381 - Soil Mechanics
- CMPUT 267 - Basics of Machine Learning
- CMPUT 466 - Machine Learning
- CMPUT 481 - Parallel and Distributed Systems
- GEOPH 332 - Physical Properties of Geomaterials
- GEOPH 421 - Seismology and the Physical Structure of the Earth
- GEOPH 431 - Geophysical Inverse Theory
- GEOPH 440 - Global Geodynamics
- EAS 209 - Geology of Western Canada and the National and Provincial Parks

- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 224 - Mineralogy I
- EAS 270 - The Atmosphere
- EAS 320 - Geochemistry I
- EAS 323 - Introduction to Hydrogeology
- EAS 324 - Quaternary Geoscience and Terrain Analysis
- EAS 421 - Structural Geology and Tectonics
- EAS 422 - Structural Interpretation of Sedimentary Basins
- EAS 425 - Contaminant Hydrogeology
- EAS 456 - Hydrologic Modeling
- ECE 209 - Fundamentals of Electrical Engineering
- MIN E 295 - Introduction to Mining Engineering
- MIN E 323 - Rock Mechanics
- PET E 365 - Well Logging and Formation Evaluation
- PHYS 261 - Physics of Energy
- PHYS 271 - Introduction to Modern Physics
- PHYS 308 - Statistical, Molecular, and Solid State Physics
- PHYS 310 - Thermodynamics and Kinetic Theory
- PHYS 362 - Optical Physics
- PHYS 420 - Computational Physics
- PHYS 467 - Fundamentals of Continuum Mechanics
- PHYS 481 - Electromagnetism II
- PHYS 499 - Undergraduate Research Project
- STAT 235 - Introductory Statistics for Engineering

Notes

1. Students entering the Major in Geophysics program after first year may take GEOPH 210 in lieu of GEOPH 110. However, students will not receive credit for both GEOPH 110 and GEOPH 210.
2. Not all 200-, 300- and 400-level Physics courses are offered every year so students should plan accordingly.
3. Students without a background in computer programming are strongly encouraged to take CMPUT 174 as one of their Science Options in their first year.
4. Students in Geophysics will not have the formal prerequisites for many of the AREC, CH E, CIV E, CMPUT, EAS, ECE, MIN E, and PET E courses, and must request permission to register in those courses from the department offering the particular course.
6. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an Geophysics program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Physics or APEGA. Full information is available at www.apega.ca.

Minor in Geophysics Requirements

Foundation Courses

3 units from

- GEOPH 110 - Introduction to Geophysics
- GEOPH 210 - Physics of the Earth

3 units from

- PHYS 124 - Particles and Waves
- PHYS 144 - Newtonian Mechanics

3 units from

- PHYS 126 - Fluids, Fields, and Radiation
- PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

3 units from

- GEOPH 223 - Environmental Geophysics
- GEOPH 325 - Gravity, Magnetic, and Electrical Geophysics

3 units from

- GEOPH 224 - Geophysical Exploration Techniques
- GEOPH 326 - Seismic Imaging

3 units from

- any 200-, 300-, and 400-level course with the following course designators:
 - PHYS
 - EAS

6 units from

- any 300- and 400-level GEOPH course

Notes

1. Upper level GEOPH and PHYS courses require certain MATH courses as prerequisites. These prerequisites must be considered when choosing Science options.
2. The Minor in Geophysics degree program does **NOT** meet the knowledge requirements for registration as a professional geophysicist (P. Geoph.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta). Current syllabus and registration information is available from the Department of Physics or APEGA. Full information is available at www.apega.ca. Specific questions about programs of study or individual courses that are applicable to professional registration can also be directed to the Departmental APEGA Liaison.

Bachelor of Science Immunology and Infection Subject Area**General Information**

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Immunology and Infection](#) (90 units)
- [Major in Immunology and Infection](#) (81 units)

Honors in Immunology and Infection Requirements**Foundation Courses**

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- MATH 134 - Calculus for the Life Sciences (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II

- IMIN 200 - Infection and Immunity
- IMIN 324 - Basic Virology
- IMIN 371 - Introduction to Immunology
- IMIN 452 - Advanced Immunology
- MICRB 265 - General Microbiology
- MMI 351 - Bacterial Pathogenesis
- ZOOL 352 - Principles of Parasitism

3 units from

-
- BIOL 201 - Eukaryotic Cellular Biology
 - CELL 201 - Introduction to Molecular Cell Biology

6 units from

-
- PHYSL 210 - Human Physiology
 - PHYSL 212 - Human Physiology I **AND**
PHYSL 214 - Human Physiology II
 - ZOOL 241 - Animal Physiology I: Homeostasis **AND**
ZOOL 242 - Animal Physiology II: Intercellular Communication

3 units from

-
- BIOCH 330 - Nucleic Acids and Molecular Biology
 - GENET 270 - Foundations of Molecular Genetics

3 units from

-
- BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - MMI 391 - Current Methods in Molecular Biology

3 units from

-
- BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
 - GENET 304 - Gene Expression and its Regulation (See Note 2)
 - MICRB 316 - Molecular Microbiology (See Note 2)

6 units from

-
- BIOL 499 - Research Project
 - MMI 499 - Independent Research in Infection and Immunity

6 units from I&I List A

-
- BIOCH 320 - Structure and Catalysis
 - BIOCH 330 - Nucleic Acids and Molecular Biology
 - BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
 - BIOCH 450 - The Molecular Biology of Mammalian Viruses
 - BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - BIOL 409 - Zoonoses
 - CELL 300 - Advanced Cell Biology I
 - ENT 378 - Insect Pathology
 - GENET 304 - Gene Expression and its Regulation
 - IMIN 372 - Research Techniques in Immunology
 - IMIN 401 - Comparative Immunology
 - IMIN 405 - Innate Immunity
 - IMIN 410 - Bioinformatics for Molecular Biologists
 - IMIN 414 - Current Topics in Bacterial Pathogenesis
 - MICRB 316 - Molecular Microbiology
 - MMI 352 - Microbial Pathogenesis
 - MMI 391 - Current Methods in Molecular Biology
 - MMI 415 - Advanced Viral Pathogenesis
 - MMI 426 - Medical Parasitology
 - MMI 436 - Inflammation
 - MMI 445 - Clinical Microbiology and Human Health

- ZOOL 452 - Topics in Parasitology

6 units from I&I List B

- BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
- BIOCH 450 - The Molecular Biology of Mammalian Viruses
- BIOL 409 - Zoonoses
- IMIN 401 - Comparative Immunology
- IMIN 405 - Innate Immunity
- IMIN 410 - Bioinformatics for Molecular Biologists
- IMIN 414 - Current Topics in Bacterial Pathogenesis
- MMI 415 - Advanced Viral Pathogenesis
- MMI 426 - Medical Parasitology
- MMI 436 - Inflammation
- MMI 445 - Clinical Microbiology and Human Health
- ZOOL 452 - Topics in Parasitology

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. If GENET 304 or MICRB 316 is taken to satisfy this requirement, students must ensure at least 3 units from List A are at the 400 level.
3. GENET 270 is the prerequisite for GENET 304 and MICRB 316, while BIOCH 320 and BIOCH 330 are prerequisites for BIOCH 430.
4. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
5. At least 3 units from List A or B must be in a course with a lab component.
6. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Major in Immunology and Infection Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- MATH 134 - Calculus for the Life Sciences (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- IMIN 200 - Infection and Immunity
- IMIN 324 - Basic Virology
- IMIN 371 - Introduction to Immunology
- IMIN 452 - Advanced Immunology
- MICRB 265 - General Microbiology
- MMI 351 - Bacterial Pathogenesis
- ZOOL 352 - Principles of Parasitism

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

6 units from

- PHYSL 210 - Human Physiology
- PHYSL 212 - Human Physiology I **AND**

PHYSL 214 - Human Physiology II

- ZOOL 241 - Animal Physiology I: Homeostasis **AND**
- ZOOL 242 - Animal Physiology II: Intercellular Communication

3 units from

-
- BIOCH 330 - Nucleic Acids and Molecular Biology
 - GENET 270 - Foundations of Molecular Genetics

3 units from

-
- BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
 - GENET 304 - Gene Expression and its Regulation (See Note 2)
 - MICRB 316 - Molecular Microbiology (See Note 2)

9 units from I&I List A

-
- BIOCH 320 - Structure and Catalysis
 - BIOCH 330 - Nucleic Acids and Molecular Biology
 - BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
 - BIOCH 450 - The Molecular Biology of Mammalian Viruses
 - BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - BIOL 409 - Zoonoses
 - CELL 300 - Advanced Cell Biology I
 - ENT 378 - Insect Pathology
 - GENET 304 - Gene Expression and its Regulation
 - IMIN 372 - Research Techniques in Immunology
 - IMIN 401 - Comparative Immunology
 - IMIN 405 - Innate Immunity
 - IMIN 410 - Bioinformatics for Molecular Biologists
 - IMIN 414 - Current Topics in Bacterial Pathogenesis
 - MICRB 316 - Molecular Microbiology
 - MMI 352 - Microbial Pathogenesis
 - MMI 391 - Current Methods in Molecular Biology
 - MMI 415 - Advanced Viral Pathogenesis
 - MMI 426 - Medical Parasitology
 - MMI 436 - Inflammation
 - MMI 445 - Clinical Microbiology and Human Health
 - ZOOL 452 - Topics in Parasitology

3 units from I&I List B

-
- BIOCH 430 - Biochemistry of Eukaryotic Gene Expression
 - BIOCH 450 - The Molecular Biology of Mammalian Viruses
 - BIOL 409 - Zoonoses
 - IMIN 401 - Comparative Immunology
 - IMIN 405 - Innate Immunity
 - IMIN 410 - Bioinformatics for Molecular Biologists
 - IMIN 414 - Current Topics in Bacterial Pathogenesis
 - MMI 415 - Advanced Viral Pathogenesis
 - MMI 426 - Medical Parasitology
 - MMI 436 - Inflammation
 - MMI 445 - Clinical Microbiology and Human Health
 - ZOOL 452 - Topics in Parasitology

Notes

-
1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
 2. If GENET 304 or MICRB 316 is taken to satisfy this requirement, students must ensure the 6 units from List A are at the 400 level.
 3. GENET 270 is the prerequisite for GENET 304 and MICRB 316, while BIOCH 320 and BIOCH 330 are prerequisites for BIOCH 430.
 4. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
 5. At least 3 units selected from List A or B must be in a course with a lab component.

6. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Bachelor of Science Integrative Physiology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Integrative Physiology \(72 units\)](#)
- [Major in Integrative Physiology \(54 units\)](#)

Honors in Integrative Physiology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences \(See Note 1\)](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 208 - Principles of Ecology](#)
- [BIOL 499 - Research Project](#)
- [CHEM 261 - Organic Chemistry I](#)
- [ZOOL 241 - Animal Physiology I: Homeostasis](#)
- [ZOOL 242 - Animal Physiology II: Intercellular Communication](#)
- [ZOOL 344 - Laboratory Exercises in Animal Physiology](#)

3 units from

- [BIOL 201 - Eukaryotic Cellular Biology](#)
- [CELL 201 - Introduction to Molecular Cell Biology](#)

3 units from

- [BOT 205 - Fundamentals of Plant Biology](#)
- [ENT 220 - Insect Biology](#)
- [GENET 270 - Foundations of Molecular Genetics](#)
- [IMIN 200 - Infection and Immunity](#)
- [MICRB 265 - General Microbiology](#)
- [ZOOL 250 - Survey of the Invertebrates](#)
- [ZOOL 325 - Comparative Anatomy of the Vertebrates](#)

3 units from

- [BIOL 445 - Current Topics in Animal and Cell Physiology](#)
- [BOT 445 - Molecular Plant Physiology](#)
- [BOT 464 - Plant Functional Genomics](#)
- [ZOOL 402 - Current Topics in Developmental Biology](#)
- [ZOOL 441 - Current Topics on Homeostasis](#)
- [ZOOL 442 - Current Topics in Intercellular Communication](#)
- [ZOOL 452 - Topics in Parasitology](#)

9 units from IP List A

- BIOL 341 - Ecotoxicology
- BIOL 445 - Current Topics in Animal and Cell Physiology
- BOT 340 - Plant Physiology
- BOT 445 - Molecular Plant Physiology
- BOT 464 - Plant Functional Genomics
- IMIN 371 - Introduction to Immunology
- ZOOL 340 - Comparative Environmental Physiology
- ZOOL 342 - Neurobiology
- ZOOL 343 - Comparative Endocrinology
- ZOOL 350 - Biology and Evolution of Invertebrates
- ZOOL 352 - Principles of Parasitism
- ZOOL 402 - Current Topics in Developmental Biology
- ZOOL 441 - Current Topics on Homeostasis
- ZOOL 442 - Current Topics in Intercellular Communication
- ZOOL 452 - Topics in Parasitology

12 units from IP List B

- any of the following courses (with at least 6 units at the 400 level):
 - BIOL 310 - Biology of Aging
 - BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - BIOL 398 - Research Project
 - BIOL 399 - Research Project
 - BIOL 409 - Zoonoses
 - BIOL 445 - Current Topics in Animal and Cell Physiology
 - BIOL 490 - Individual Study (if appropriate topic)
 - BIOL 495 - Special Topics in Biology (if appropriate topic)
 - BIOL 498 - Research Project
 - BIOL 499 - Research Project
 - BOT 303 - Plant Development
 - BOT 340 - Plant Physiology
 - BOT 380 - Drug Plants
 - BOT 445 - Molecular Plant Physiology
 - BOT 464 - Plant Functional Genomics
 - CELL 300 - Advanced Cell Biology I
 - CELL 301 - Advanced Cell Biology II
 - CELL 402 - The Birth and Death of a Cell
 - CELL 415 - Developmental and Molecular Neurobiology
 - GENET 301 - Molecular Genetics of the Eukaryotic Cell
 - GENET 304 - Gene Expression and its Regulation
 - GENET 375 - Introduction to Molecular Genetics Techniques
 - GENET 390 - Gene Manipulation
 - GENET 412 - Genetic Control of Animal Development
 - GENET 420 - Research Techniques in Molecular Genetics
 - IMIN 371 - Introduction to Immunology
 - IMIN 372 - Research Techniques in Immunology
 - IMIN 401 - Comparative Immunology
 - IMIN 405 - Innate Immunity
 - MA SC 415 - Structure and Function in Animals
 - MICRB 311 - Microbial Physiology
 - NEURO 410 - Cellular and Molecular Aspects of Normal Aging and Neurodegenerative Disorders
 - NEURO 411 - Clinical and Basic Science Aspects of Age-related Neurodegenerative Disorders
 - NEURO 443 - Neuroendocrine Concepts
 - NEURO 472 - Autonomic Nervous System
 - NEURO 496 - Computational Neuroscience
 - PMCOL 371 - Cellular Neuroscience
 - PHYSL 372 - Systems Neuroscience
 - PHYSL 400 - Reproductive Physiology
 - PHYSL 403 - Neuroendimmunomodulation
 - PHYSL 404 - Cardiovascular Physiology
 - PHYSL 405 - Sensory Physiology
 - PHYSL 444 - Current Topics in Neuroscience
 - ZOOL 303 - Animal Developmental Biology
 - ZOOL 340 - Comparative Environmental Physiology
 - ZOOL 342 - Neurobiology
 - ZOOL 343 - Comparative Endocrinology
 - ZOOL 352 - Principles of Parasitism
 - ZOOL 370 - Ethological Mechanisms

- ZOOL 402 - Current Topics in Developmental Biology
- ZOOL 441 - Current Topics on Homeostasis
- ZOOL 442 - Current Topics in Intercellular Communication
- ZOOL 452 - Topics in Parasitology

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Major in Integrative Physiology Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- MATH 134 - Calculus for the Life Sciences (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology
- CHEM 261 - Organic Chemistry I
- ZOOL 241 - Animal Physiology I: Homeostasis
- ZOOL 242 - Animal Physiology II: Intercellular Communication
- ZOOL 344 - Laboratory Exercises in Animal Physiology

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

3 units from

- BIOL 445 - Current Topics in Animal and Cell Physiology
- BOT 445 - Molecular Plant Physiology
- BOT 464 - Plant Functional Genomics
- ZOOL 402 - Current Topics in Developmental Biology
- ZOOL 441 - Current Topics on Homeostasis
- ZOOL 442 - Current Topics in Intercellular Communication
- ZOOL 452 - Topics in Parasitology

3 units from IP List A

- BIOL 341 - Ecotoxicology
- BIOL 445 - Current Topics in Animal and Cell Physiology
- BOT 340 - Plant Physiology
- BOT 445 - Molecular Plant Physiology
- BOT 464 - Plant Functional Genomics
- IMIN 371 - Introduction to Immunology
- ZOOL 340 - Comparative Environmental Physiology
- ZOOL 342 - Neurobiology
- ZOOL 343 - Comparative Endocrinology
- ZOOL 350 - Biology and Evolution of Invertebrates
- ZOOL 352 - Principles of Parasitism
- ZOOL 402 - Current Topics in Developmental Biology
- ZOOL 441 - Current Topics on Homeostasis
- ZOOL 442 - Current Topics in Intercellular Communication
- ZOOL 452 - Topics in Parasitology

9 units from IP List B

- any of the following courses (with at least 3 units at the 400 level):
 - BIOL 310 - Biology of Aging
 - BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - BIOL 398 - Research Project
 - BIOL 399 - Research Project
 - BIOL 409 - Zoonoses
 - BIOL 445 - Current Topics in Animal and Cell Physiology
 - BIOL 490 - Individual Study (if appropriate topic)
 - BIOL 495 - Special Topics in Biology (if appropriate topic)
 - BIOL 498 - Research Project
 - BIOL 499 - Research Project
 - BOT 303 - Plant Development
 - BOT 340 - Plant Physiology
 - BOT 380 - Drug Plants
 - BOT 445 - Molecular Plant Physiology
 - BOT 464 - Plant Functional Genomics
 - CELL 300 - Advanced Cell Biology I
 - CELL 301 - Advanced Cell Biology II
 - CELL 402 - The Birth and Death of a Cell
 - CELL 415 - Developmental and Molecular Neurobiology
 - GENET 301 - Molecular Genetics of the Eukaryotic Cell
 - GENET 304 - Gene Expression and its Regulation
 - GENET 375 - Introduction to Molecular Genetics Techniques
 - GENET 390 - Gene Manipulation
 - GENET 412 - Genetic Control of Animal Development
 - GENET 420 - Research Techniques in Molecular Genetics
 - IMIN 371 - Introduction to Immunology
 - IMIN 372 - Research Techniques in Immunology
 - IMIN 401 - Comparative Immunology
 - IMIN 405 - Innate Immunity
 - MA SC 415 - Structure and Function in Animals
 - MICRB 311 - Microbial Physiology
 - NEURO 410 - Cellular and Molecular Aspects of Normal Aging and Neurodegenerative Disorders
 - NEURO 411 - Clinical and Basic Science Aspects of Age-related Neurodegenerative Disorders
 - NEURO 443 - Neuroendocrine Concepts
 - NEURO 472 - Autonomic Nervous System
 - NEURO 496 - Computational Neuroscience
 - PMCOL 371 - Cellular Neuroscience
 - PHYSL 372 - Systems Neuroscience
 - PHYSL 400 - Reproductive Physiology
 - PHYSL 403 - Neuroendimmunomodulation
 - PHYSL 404 - Cardiovascular Physiology
 - PHYSL 405 - Sensory Physiology
 - PHYSL 444 - Current Topics in Neuroscience
 - ZOO 303 - Animal Developmental Biology
 - ZOO 340 - Comparative Environmental Physiology
 - ZOO 342 - Neurobiology
 - ZOO 343 - Comparative Endocrinology
 - ZOO 352 - Principles of Parasitism
 - ZOO 370 - Ethological Mechanisms
 - ZOO 402 - Current Topics in Developmental Biology
 - ZOO 441 - Current Topics on Homeostasis
 - ZOO 442 - Current Topics in Intercellular Communication
 - ZOO 452 - Topics in Parasitology

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Bachelor of Science Mathematical Physics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Mathematical Physics](#) (90 units)
- [Major in Mathematical Physics](#) (75 units)

Honors in Mathematical Physics Requirements

Foundation Courses

- [PHYS 144 - Newtonian Mechanics](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)

3 units from

- [MATH 118 - Honors Calculus II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)

3 units from

- [MATH 125 - Linear Algebra I](#)
- [MATH 127 - Honors Linear Algebra I](#)

Senior Courses

- [MA PH 343 - Classical Mechanics II](#)
- [MA PH 451 - Mathematical Methods for Physics II](#)
- [MA PH 364 - Group Theory in Physics \(See Note 3\)](#)
- [MA PH 499 - Undergraduate Research Project](#)
- [MATH 216 - Introduction to Analysis \(See Note 1\)](#)
- [MATH 217 - Honors Calculus III](#)
- [MATH 317 - Honors Calculus IV](#)
- [MATH 337 - Introduction to Partial Differential Equations](#)
- [MATH 411 - Honors Complex Variables](#)
- [PHYS 234 - Introductory Computational Physics](#)
- [PHYS 244 - Classical Mechanics](#)
- [PHYS 271 - Introduction to Modern Physics](#)
- [PHYS 295 - Experimental Physics I](#)
- [PHYS 310 - Thermodynamics and Kinetic Theory](#)
- [PHYS 311 - Statistical Physics](#)
- [PHYS 362 - Optical Physics](#)
- [PHYS 372 - Quantum Mechanics I](#)
- [PHYS 381 - Electromagnetism I](#)
- [PHYS 458 - Special and General Relativity](#)
- [PHYS 472 - Quantum Mechanics II](#)
- [PHYS 481 - Electromagnetism II](#)

3 units from

- [MATH 225 - Linear Algebra II](#)
- [MATH 227 - Honors Linear Algebra II](#)

3 units from

- MA PH 251 - Differential Equations for Physics
- MATH 334 - Ordinary Differential Equations
- MATH 336 - Honors Ordinary Differential Equations

3 units from

-
- any 400-level course with the following course designators:
 - ASTRO (See Note 2)
 - PHYS

3 units from

-
- any 400-level course with the following course designators:
 - MATH
 - PHYS

Notes

-
1. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from MATH at the 200 level or higher.
 2. Students that take 3 units in a 400-level ASTRO course for this program requirement will also be satisfying the Breadth from Within the Faculty of Science requirement.
 3. MA PH 364 may be offered every second year and must be taken in either Year 3 or Year 4.

Major in Mathematical Physics Requirements

Foundation Courses

-
- MATH 102 - Applied Linear Algebra
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II
 - PHYS 144 - Newtonian Mechanics
 - PHYS 146 - Relativity, Electricity and Magnetism

Senior Courses

-
- MA PH 251 - Differential Equations for Physics
 - MA PH 351 - Mathematical Methods for Physics I
 - MA PH 343 - Classical Mechanics I
 - MA PH 451 - Mathematical Methods for Physics II
 - MA PH 364 - Group Theory in Physics (See Note 3)
 - MATH 214 - Calculus III
 - PHYS 234 - Introductory Computational Physics
 - PHYS 244 - Classical Mechanics
 - PHYS 271 - Introduction to Modern Physics
 - PHYS 295 - Experimental Physics I
 - PHYS 310 - Thermodynamics and Kinetic Theory
 - PHYS 311 - Statistical Physics
 - PHYS 362 - Optical Physics
 - PHYS 372 - Quantum Mechanics I
 - PHYS 381 - Electromagnetism I
 - PHYS 458 - Special and General Relativity
 - PHYS 472 - Quantum Mechanics II
 - PHYS 481 - Electromagnetism II

6 units from

-
- any 300- and 400-level course with the following course designators:
 - ASTRO (See Note 1)
 - GEOPH (See Note 1)
 - MA PH
 - PHYS

Notes

1. Students that take 3 units in a 300- or 400- level ASTRO or GEOPH course for this program requirement will also be satisfying the Breadth from Within the Faculty of Science requirement.
2. MA PH 364 may be offered every second year and must be taken in either Year 3 or Year 4.

Bachelor of Science Mathematics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Mathematics](#) (66 units)
- [Major in Mathematics](#) (51 units)
- [Minor in Mathematics](#) (24 units)

Honors in Mathematics Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#) (See Note 1)
- [CMPUT 175 - Introduction to the Foundations of Computation II](#) (See Note 1)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)
- [MATH 154 - Calculus for Business and Economics I](#)

3 units from

- [MATH 118 - Honors Calculus II](#)
- [MATH 136 - Calculus for the Life Sciences II](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)
- [MATH 156 - Calculus for Business and Economics II](#)

3 units from

- [MATH 125 - Linear Algebra I](#)
- [MATH 127 - Honors Linear Algebra I](#)

Senior Courses

- [MATH 216 - Introduction to Analysis](#) (See Note 2)
- [MATH 217 - Honors Calculus III](#)
- [MATH 226 - Introduction to Abstract Algebra](#) (See Note 3)
- [MATH 317 - Honors Calculus IV](#)
- [MATH 329 - Algebra II](#)
- [MATH 336 - Honors Ordinary Differential Equations](#)
- [MATH 411 - Honors Complex Variables](#)
- [MATH 412 - Algebraic Number Theory](#)
- [MATH 417 - Introduction to Measure Theory](#)
- [MATH 418 - Introduction to Functional Analysis](#)
- [MATH 429 - Advanced Group Theory](#)
- [MATH 447 - Elementary Topology](#)

- MATH 448 - Introduction to Differential Geometry
- MATH 499 - Research Project
- STAT 265 - Statistics I

3 units from

-
- MATH 225 - Linear Algebra II
 - MATH 227 - Honors Linear Algebra II

3 units from

-
- MATH 364 - Group Theory in Physics
 - MATH 327 - Algebra I

Notes

-
1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
 2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from MATH at the 200 level or higher.
 3. Students that complete MATH 127 and MATH 227 can replace MATH 226 with 3 units selected from any 200-, 300-, and 400-level MATH course
 4. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
 5. Several of the required courses, including MATH 411, MATH 424, MATH 447, MATH 448, may only be offered in alternate years.
 6. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.

Major in Mathematics Requirements

Foundation Courses

-
- CMPUT 174 - Introduction to the Foundations of Computation I (See Note 1)
 - CMPUT 175 - Introduction to the Foundations of Computation II (See Note 1)

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 134 - Calculus for the Life Sciences I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I
 - MATH 154 - Calculus for Business and Economics I

3 units from

-
- MATH 118 - Honors Calculus II
 - MATH 136 - Calculus for the Life Sciences II
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II
 - MATH 156 - Calculus for Business and Economics II

3 units from

-
- MATH 125 - Linear Algebra I
 - MATH 127 - Honors Linear Algebra I

Senior Courses

-
- MATH 216 - Introduction to Analysis (See Note 2)
 - MATH 226 - Introduction to Abstract Algebra (See Note 3)
 - STAT 265 - Introduction to Probability

3 units from

-
- MATH 214 - Calculus III

- MATH 217 - Honors Calculus III

3 units from

- MATH 225 - Linear Algebra II
- MATH 227 - Honors Linear Algebra II

3 units from

- MATH 315 – Calculus IV
- MATH 317 - Honors Calculus IV

3 units from

- MATH 334 - Ordinary Differential Equations
- MATH 336 - Honors Ordinary Differential Equations

3 units from

- MA PH 364 - Group Theory in Physics
- MATH 327 - Algebra I

3 units from

- MATH 311 - Theory of Functions of a Complex Variable
- MATH 411 - Honors Complex Variables

3 units from

- MATH 348 - Differential Geometry of Curves and Surfaces
- MATH 448 - Introduction to Differential Geometry

6 units from

- any 400-level MA PH course
- any 400-level MATH course

Notes

1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from MATH at the 200 level or higher.
3. Students that complete MATH 127 and MATH 227 can replace MATH 226 with 3 units selected from any 200-, 300-, and 400-level MATH course.
4. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
5. Several of the required courses, including MATH 411, MATH 424, MATH 447, MATH 448, may only be offered in alternate years.

Minor in Mathematics Requirements

Foundation Courses

3 units from

- MATH 117 - Honors Calculus I
- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 118 - Honors Calculus II
- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- MATH 156 - Calculus for Business and Economics II

3 units from

-
- MATH 125 - Linear Algebra I
 - MATH 127 - Honors Linear Algebra I

Senior Courses

3 units from

-
- MATH 214 - Calculus III
 - MATH 217 - Honors Calculus III

3 units from

-
- MATH 225 - Linear Algebra II
 - MATH 227 - Honors Linear Algebra II

3 units from

-
- MATH 334 - Ordinary Differential Equations
 - MATH 336 - Honors Ordinary Differential Equations

3 units from

-
- any 200-, 300-, and 400-level course with the following course designators:
 - MA PH
 - MATH

3 units from

-
- any 300- and 400-level course with the following course designators:
 - MA PH
 - MATH

Notes

-
1. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.

Bachelor of Science Mathematics and Economics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

-
- [Honors in Mathematics and Economics](#) (96 units)
 - [Major in Mathematics and Economics](#) (81 units)

Honors in Mathematics and Economics Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I (See Note 1)
- CMPUT 175 - Introduction to the Foundations of Computation II (See Note 1)
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics

3 units from

- MATH 117 - Honors Calculus I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 118 - Honors Calculus II
- MATH 156 - Calculus for Business and Economics II

3 units from

- MATH 125 - Linear Algebra I
- MATH 127 - Honors Linear Algebra I

Senior Courses

- ECON 281 - Intermediate Microeconomic Theory I
- ECON 282 - Intermediate Macroeconomic Theory I
- ECON 384 - Intermediate Microeconomic Theory II
- ECON 385 - Intermediate Macroeconomic Theory II
- ECON 481 - Advanced Microeconomic Theory
- ECON 482 - Advanced Macroeconomic Theory
- ECON 497 - Econometric Methods
- MATH 216 - Introduction to Analysis (See Note 2)
- MATH 217 - Honors Calculus III
- MATH 226 - Introduction to Abstract Algebra (See Note 3)
- MATH 317 - Honors Calculus IV
- STAT 265 - Introduction to Probability
- STAT 266 - Introduction to Statistics
- STAT 378 - Applied Regression Analysis

3 units from

- MATH 225 - Linear Algebra II
- MATH 227 - Honors Linear Algebra II

12 units from

- MATH 336 - Honors Ordinary Differential Equations
- MATH 373 - Linear Optimization
- MATH 381 - Numerical Methods
- MATH 417 - Introduction to Measure Theory
- STAT 371 - Probability and Stochastic Processes
- STAT 372 - Mathematical Statistics
- STAT 479 - Time Series Analysis

3 units from

- MATH 499 - Research Project
- STAT 499 - Research Project

9 units from

- and 200-, 300-, and 400-level ECON course

6 units from

- any 200-, 300-, and 400-level course with the following course designators:
 - MATH (See Note 4)
 - STAT (See Note 4)

Notes

1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
3. Students that complete MATH 127 and MATH 227 can replace MATH 226 with 3 units selected from any 200-, 300-, and 400-level MATH course.
4. If only one of MATH 417 and MATH 479 is taken, then 3 units of this program requirement must be at the 400 level; if neither MATH 417 nor MATH 479 are taken, then the full 6 units must be at the 400 level.
5. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
6. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.
7. 300- and 400-level ECON courses require successful completion of either the Assessment of Reading, Comprehension, and Writings in Economics or ECON 109. The later course may be used as an Open Option in the degree.

Major in Mathematics and Economics Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#) (See Note 1)
- [CMPUT 175 - Introduction to the Foundations of Computation II](#) (See Note 1)
- [ECON 101 - Introduction to Microeconomics](#)
- [ECON 102 - Introduction to Macroeconomics](#)
- [MATH 154 - Calculus for Business and Economics I](#)
- [MATH 156 - Calculus for Business and Economics II](#)
- [STAT 161 - Introductory Statistics for Business and Economics](#) (See Note 4)

3 units from

- [MATH 125 - Linear Algebra I](#)
- [MATH 127 - Honors Linear Algebra I](#)

Senior Courses

- [ECON 281 - Intermediate Microeconomic Theory I](#)
- [ECON 282 - Intermediate Macroeconomic Theory I](#)
- [ECON 399 - Introductory Econometrics](#)
- [MATH 216 - Introduction to Analysis](#) (See Note 2)
- [STAT 265 - Introduction to Probability](#)
- [STAT 266 - Introduction to Statistics](#)

3 units from

- [MATH 214 - Calculus III](#)
- [MATH 217 - Honors Calculus III](#)

3 units from

- [MATH 225 - Linear Algebra II](#)
- [MATH 227 - Honors Linear Algebra II](#)

3 units from

- [MATH 334 - Ordinary Differential Equations](#)
- [MATH 336 - Honors Ordinary Differential Equations](#)

3 units from

-
- [ECON 384 - Intermediate Microeconomic Theory II](#)
 - any 400-level ECON course

3 units from

-
- [ECON 385 - Intermediate Macroeconomic Theory II](#)
 - any 400-level ECON course

12 units from

-
- any 200-, 300-, and 400-level ECON course

3 units from

-
- any 400-level ECON course

9 units from

-
- any 300- and 400-level course with the following course designators (with at least 6 units at the 400 level):
 - MATH
 - STAT

Notes

-
1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
 2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
 3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
 4. STAT 161 can be replaced by STAT 151.
 5. 300- and 400-level ECON courses require successful completion of either the Assessment of Reading, Comprehension, and Writings in Economics or ECON 109. The later course may be used as an Open Option in the degree.

Bachelor of Science Mathematics and Finance Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

-
- [Honors in Mathematics and Finance](#) (99 units)
 - [Major in Mathematics and Finance](#) (84 units)

Honors in Mathematics and Finance Requirements

Foundation Courses

-
- [CMPUT 174 - Introduction to the Foundations of Computation I](#) (See Note 1)
 - [CMPUT 175 - Introduction to the Foundations of Computation II](#) (See Note 1)
 - [ECON 101 - Introduction to Microeconomics](#)

- ECON 102 - Introduction to Macroeconomics
- STAT 161 - Introductory Statistics for Business and Economics (See Note 4)

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 154 - Calculus for Business and Economics I

3 units from

-
- MATH 118 - Honors Calculus II
 - MATH 156 - Calculus for Business and Economics II

3 units from

-
- MATH 125 - Linear Algebra I
 - MATH 127 - Honors Linear Algebra I

Senior Courses

-
- ACCTG 311 - Introduction to Accounting for Financial Performance
 - ECON 281 - Intermediate Microeconomic Theory I
 - FIN 301 - Introduction to Finance
 - FIN 412 - Investment Principles
 - FIN 413 - Risk Management
 - MATH 216 - Introduction to Analysis (See Note 2)
 - MATH 217 - Honors Calculus III
 - MATH 253 - Theory of Interest
 - MATH 317 - Honors Calculus IV
 - MATH 336 - Honors Ordinary Differential Equations
 - MATH 337 - Introduction to Partial Differential Equations
 - MATH 356 - Introduction to Mathematical Finance I
 - MATH 357 - Introduction to Mathematical Finance II
 - MATH 373 - Linear Optimization
 - MATH 417 - Introduction to Measure Theory
 - OM 352 - Operations Management
 - STAT 265 - Introduction to Probability
 - STAT 266 - Introduction to Statistics
 - STAT 371 - Probability and Stochastic Processes
 - STAT 471 - Probability I

3 units from

-
- MATH 225 - Linear Algebra II
 - MATH 227 - Honors Linear Algebra II

3 units from

-
- ECON 399 - Introductory Econometrics
 - STAT 378 - Applied Regression Analysis

3 units from

-
- MATH 408 - Computational Finance
 - MATH 415 - Mathematical Finance I

3 units from

-
- MATH 499 - Research Project
 - STAT 499 - Research Project

3 units from

-
- any 400-level FIN course

Notes

1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
4. STAT 161 can be replaced by STAT 151.
5. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.
6. Students planning on taking ECON 399 in place of STAT 378 will need to take ECON 282 in their degree program and ensure successful completion of either the Assessment of Reading, Comprehension, and Writing in Economics or ECON 109. The ECON 299 prerequisite for ECON 399 is met by STAT 265 and 266.

Major in Mathematics and Finance Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I \(See Note 1\)](#)
- [CMPUT 175 - Introduction to the Foundations of Computation II \(See Note 1\)](#)
- [ECON 101 - Introduction to Microeconomics](#)
- [ECON 102 - Introduction to Macroeconomics](#)
- [MATH 154 - Calculus for Business and Economics I](#)
- [MATH 156 - Calculus for Business and Economics II](#)
- [STAT 161 - Introductory Statistics for Business and Economics \(See Note 4\)](#)

3 units from

- [MATH 125 - Linear Algebra I](#)
- [MATH 127 - Honors Linear Algebra I](#)

Senior Courses

- [ACCTG 311 - Introduction to Accounting for Financial Performance](#)
- [ECON 281 - Intermediate Microeconomic Theory I](#)
- [FIN 301 - Introduction to Finance](#)
- [MATH 216 - Introduction to Analysis \(See Note 2\)](#)
- [MATH 253 - Theory of Interest](#)
- [MATH 356 - Introduction to Mathematical Finance I](#)
- [MATH 357 - Introduction to Mathematical Finance II](#)
- [MATH 373 - Linear Optimization](#)
- [OM 352 - Operations Management](#)
- [STAT 265 - Introduction to Probability](#)
- [STAT 266 - Introduction to Statistics](#)
- [STAT 371 - Probability and Stochastic Processes](#)
- [STAT 471 - Probability I](#)

3 units from

- [MATH 214 - Calculus III](#)
- [MATH 217 - Honors Calculus III](#)

3 units from

- [MATH 225 - Linear Algebra II](#)
- [MATH 227 - Honors Linear Algebra II](#)

3 units from

- [MATH 334 - Ordinary Differential Equations](#)
- [MATH 336 - Honors Ordinary Differential Equations](#)

3 units from

- [ECON 399 - Introductory Econometrics](#)
- [STAT 378 - Applied Regression Analysis](#)

9 units from

- any 400-level FIN course

Notes

1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
4. STAT 161 can be replaced by STAT 151.
5. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.
6. Students planning on taking ECON 399 in place of STAT 378 will need to take ECON 282 in their degree program and ensure successful completion of either the Assessment of Reading, Comprehension, and Writing in Economics or ECON 109. The ECON 299 prerequisite for ECON 399 is met by STAT 265 and 266.

Bachelor of Science Molecular, Cellular and Developmental Biology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Molecular, Cellular and Developmental Biology \(72 units\)](#)
- [Major in Molecular, Cellular and Developmental Biology \(54 units\)](#)

Honors in Molecular, Cellular and Developmental Biology Requirements**Foundation Courses**

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences \(See Note 1\)](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)
- [GENET 270 - Foundations of Molecular Genetics](#)
- [MICRB 265 - General Microbiology](#)
- [BIOL 499 - Research Project](#)
- [CHEM 261 - Organic Chemistry I](#)

3 units from

- [BIOL 201 - Eukaryotic Cellular Biology](#)
- [CELL 201 - Introduction to Molecular Cell Biology](#)

6 units from MC&D List A

- BIOL 208 - Principles of Ecology
- BIOL 221 - Mechanisms of Evolution
- BOT 205 - Fundamentals of Plant Biology
- GENET 301 - Molecular Genetics of the Eukaryotic Cell
- GENET 302 - Genetics of Eukaryotic Chromosomes
- IMIN 200 - Infection and Immunity
- ZOOL 303 - Animal Developmental Biology

21 units from MC&D List B

- any of the following courses (with at least 3 units at the 400 level):
 - BIOL 495 - Special Topics in Biology (if appropriate topic)
 - BOT 303 - Plant Development
 - BOT 380 - Drug Plants
 - BOT 382 - Plant Biotechnology
 - BOT 445 - Molecular Plant Physiology
 - BOT 464 - Plant Functional Genomics
 - GENET 304 - Gene Expression and its Regulation
 - GENET 305 - Genetic Analysis
 - GENET 364 - Plant Genetics
 - GENET 390 - Gene Manipulation
 - GENET 412 - Genetic Control of Animal Development
 - GENET 418 - Human Genetics
 - GENET 422 - Current Topics in Developmental Genetics
 - GENET 424 - Ethical Issues in Genetics
 - IMIN 405 - Innate Immunity
 - IMIN 452 - Advanced Immunology
 - MICRB 311 - Microbial Physiology
 - MICRB 315 - Applied Microbiology and Biotechnology
 - MICRB 316 - Molecular Microbiology

6 units from MC&D List C

- any of the following courses (with at least 3 units at the 400 level):
 - BIOIN 301 - Bioinformatics I
 - BIOIN 401 - Bioinformatics II
 - BIOL 343 - Techniques for Macromolecular Characterization
 - BIOL 391 - Techniques in Molecular Biology and Bioinformatics
 - BIOL 398 - Research Project
 - BIOL 399 - Research Project
 - BIOL 498 - Research Project
 - GENET 375 - Introduction to Molecular Genetics Techniques
 - GENET 420 - Research Techniques in Molecular Genetics
 - IMIN 372 - Research Techniques in Immunology
 - IMIN 410 - Bioinformatics for Molecular Biologists

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.
2. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Major in Molecular, Cellular and Developmental Biology Requirements**Foundation Courses**

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- CHEM 101 - Introductory University Chemistry I
- MATH 134 - Calculus for the Life Sciences (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- GENET 270 - Foundations of Molecular Genetics
- CHEM 261 - Organic Chemistry I

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

6 units from MC&D List A

- BIOL 208 - Principles of Ecology
- BIOL 221 - Mechanisms of Evolution
- BOT 205 - Fundamentals of Plant Biology
- GENET 301 - Molecular Genetics of the Eukaryotic Cell
- GENET 302 - Genetics of Eukaryotic Chromosomes
- IMIN 200 - Infection and Immunity
- MICRB 265 - General Microbiology
- ZOOL 303 - Animal Developmental Biology

15 units from MC&D List B

- any of the following courses (with at least 6 units at the 400 level):
 - BIOL 495 - Special Topics in Biology (if appropriate topic)
 - BOT 303 - Plant Development
 - BOT 380 - Drug Plants
 - BOT 382 - Plant Biotechnology
 - BOT 445 - Molecular Plant Physiology
 - BOT 464 - Plant Functional Genomics
 - GENET 304 - Gene Expression and its Regulation
 - GENET 305 - Genetic Analysis
 - GENET 364 - Plant Genetics
 - GENET 390 - Gene Manipulation
 - GENET 412 - Genetic Control of Animal Development
 - GENET 418 - Human Genetics
 - GENET 422 - Current Topics in Developmental Genetics
 - GENET 424 - Ethical Issues in Genetics
 - IMIN 405 - Innate Immunity
 - IMIN 452 - Advanced Immunology
 - MICRB 311 - Microbial Physiology
 - MICRB 315 - Applied Microbiology and Biotechnology
 - MICRB 316 - Molecular Microbiology

3 units from MC&D List C

- BIOIN 301 - Bioinformatics I
- BIOIN 401 - Bioinformatics II
- BIOL 343 - Techniques for Macromolecular Characterization
- BIOL 391 - Techniques in Molecular Biology and Bioinformatics
- BIOL 398 - Research Project
- BIOL 399 - Research Project
- BIOL 498 - Research Project
- GENET 375 - Introduction to Molecular Genetics Techniques
- GENET 420 - Research Techniques in Molecular Genetics
- IMIN 372 - Research Techniques in Immunology
- IMIN 410 - Bioinformatics for Molecular Biologists

Notes

1. MATH 134 is strongly recommended; however, it may be replaced with MATH 117 or MATH 144.

2. Students should consult the Department of Biological Sciences for advice about course selection throughout the program.

Bachelor of Science Neuroscience Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Neuroscience](#) (90 units)
- [Major in Neuroscience](#) (72 units)

Honors in Neuroscience Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [PHYS 124 - Particles and Waves](#)
- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PSYCH 104 - Basic Psychological Processes](#)

3 units from

- [MATH 136 - Calculus for the Life Sciences II](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOL 207 - Molecular Genetics and Heredity](#)
- [CHEM 261 - Organic Chemistry I](#)
- [CHEM 263 - Organic Chemistry II](#)
- [NEURO 210 - Introduction to Clinical Neuroscience](#)
- [NEURO 375 - Functional Neuroanatomy](#)
- [PHYSL 212 - Human Physiology I](#)
- [PHYSL 214 - Human Physiology II](#)
- [PHYSL 372 - Systems Neuroscience](#)
- [PSYCH 275 - Brain and Behavior](#)

3 units from

- [BIOL 201 - Eukaryotic Cellular Biology](#)
- [CELL 201 - Introduction to Molecular Cell Biology](#)

3 units from

- [PMCOL 371 - Cellular Neuroscience](#)
- [ZOOL 342 - Neurobiology](#)

9 units from

- [GENET 270 - Foundations of Molecular Genetics](#)
- [GENET 390 - Gene Manipulation](#)
- [PSYCH 371 - The Neurobiology of Learning and Memory](#)
- [PSYCH 375 - Introduction to Cognitive Neuroscience](#)
- [PSYCH 377 - Human Neuropsychology](#)

- ZOOL 344 - Laboratory Exercises in Animal Physiology

6 units from List A (Cellular and Molecular Neuroscience)

- NEURO 410 - Cellular and Molecular Aspects of Normal Aging and Neurodegenerative Disorders
- NEURO 411 - Clinical and Basic Science Aspects of Age-related Neurodegenerative Disorders
- PHYSL 444 - Current Topics in Neuroscience
- PMCOL 412 - Drugs and the Nervous System
- PMCOL 475 - Signal Transduction Systems as Pharmacological Targets
- PMCOL 512 - Pharmacology of the Synapse
- PSYCH 478 - Behavior and Brain Chemistry

6 units from List B (Systems and Cognitive Neuroscience)

- KIN 497 - Selected Topics in Kinesiology and Sport
- NEURO 443 - Neuroendocrine Concepts
- NEURO 520 - Neuroplasticity
- NEURO 525 - Neuroimaging in Neuroscience
- PHYSL 403 - Neuroendimmunomodulation
- PHYSL 405 - Sensory Physiology
- PSYCI 511 - Biological Aspects of Psychiatry
- PSYCH 471 - Neurophysiology: Theory, Methods, and Analysis

12 units in either the

Thesis Stream: (see Note 1)

- NEURO 498 - Honors Research Project in Neuroscience I **AND**
- NEURO 499 - Honors Research Project in Neuroscience II

OR

Non-Thesis Stream:

- NEURO 450 - Readings on Selected Topics in Neuroscience **AND**
- NEURO 451 - Honors Research Project in Neuroscience **AND/OR**
- NEURO 452 - Honors Research Project in Neuroscience
- 3-6 units from List A or B (See Note 2)

Notes

1. Students following the Thesis stream are allowed to take a maximum of 3 units from NEURO 451 and NEURO 452. These units may count toward either the List A or B requirement, if an appropriate topic is selected. Otherwise, they will count toward the open options for the BSc Honors degree. Please consult with an Academic Advisor as needed.
2. 3 units are required from List A or B if NEURO 450, NEURO 451 and NEURO 452 are taken OR 6 units are required from List A or B if NEURO 450 and one of NEURO 451 or NEURO 452 are taken.
3. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.

Major in Neuroscience Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- MATH 134 - Calculus for the Life Sciences I
- PHYS 124 - Particles and Waves
- PHYS 126 - Fluids, Fields, and Radiation
- PSYCH 104 - Basic Psychological Processes

3 units from

- MATH 136 - Calculus for the Life Sciences II

- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOL 207 - Molecular Genetics and Heredity
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- NEURO 210 - Introduction to Clinical Neuroscience
- NEURO 375 - Functional Neuroanatomy
- PHYSL 210 - Human Physiology
- PHYSL 372 - Systems Neuroscience
- PSYCH 275 - Brain and Behavior

3 units from

- PMCOL 371 - Cellular Neuroscience
- ZOOL 342 - Neurobiology

6 units from

- GENET 270 - Foundations of Molecular Genetics
- GENET 390 - Gene Manipulation
- PSYCH 371 - The Neurobiology of Learning and Memory
- PSYCH 375 - Introduction to Cognitive Neuroscience
- PSYCH 377 - Human Neuropsychology
- ZOOL 344 - Laboratory Exercises in Animal Physiology

6 units from List A (Cellular and Molecular Neuroscience)

- NEURO 410 - Cellular and Molecular Aspects of Normal Aging and Neurodegenerative Disorders
- NEURO 411 - Clinical and Basic Science Aspects of Age-related Neurodegenerative Disorders
- NEURO 450 - Readings on Selected Topics in Neuroscience (if appropriate topic; see Note 1)
- NEURO 451 - Honors Research Project in Neuroscience (if appropriate topic; see Note 1)
- NEURO 452 - Honors Research Project in Neuroscience (if appropriate topic; see Note 1)
- PHYSL 444 - Current Topics in Neuroscience
- PMCOL 412 - Drugs and the Nervous System
- PMCOL 475 - Signal Transduction Systems as Pharmacological Targets
- PMCOL 512 - Pharmacology of the Synapse
- PSYCH 478 - Behavior and Brain Chemistry

6 units from List B (Systems and Cognitive Neuroscience)

- KIN 497 - Selected Topics in Kinesiology and Sport
- NEURO 443 - Neuroendocrine Concepts
- NEURO 450 - Readings on Selected Topics in Neuroscience (if appropriate topic; see Note 1)
- NEURO 451 - Honors Research Project in Neuroscience (if appropriate topic; see Note 1)
- NEURO 452 - Honors Research Project in Neuroscience (if appropriate topic; see Note 1)
- NEURO 520 - Neuroplasticity
- NEURO 525 - Neuroimaging in Neuroscience
- PHYSL 403 - Neuroendimmunomodulation
- PHYSL 405 - Sensory Physiology
- PSYCI 511 - Biological Aspects of Psychiatry
- PSYCH 471 - Neurophysiology: Theory, Methods, and Analysis

Notes

1. A maximum of 3 units is allowed from NEURO 450, NEURO 451 and NEURO 452.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.

Bachelor of Science Paleontology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Paleontology](#) (90 units)
- [Major in Paleontology](#) (78 units)

Honors in Paleontology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [EAS 100 - Planet Earth](#)
- [EAS 105 - The Dynamic Earth Through Time](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

3 units from

- [MATH 117 - Honors Calculus I](#)
- [MATH 125 - Linear Algebra I](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)

Senior Courses

- [BIOL 207 - Molecular Genetics and Heredity](#)
- [BIOL 208 - Principles of Ecology](#)
- [BIOL 221 - Mechanisms of Evolution](#)
- [BIOL 335 - Principles of Systematics](#)
- [EAS 222 - Stratigraphy and Sedimentation](#)
- [EAS 230 - Introduction to Invertebrate Paleontology](#)
- [EAS 233 - Geologic Structures](#)
- [EAS 234 - Geology Field School](#)

3 units from

- [ZOOL 242 - Animal Physiology II: Intercellular Communication](#)
- [ZOOL 250 - Survey of the Invertebrates](#)

3 units from

- [EAS 465 - Sedimentology](#)
- [ZOOL 325 - Comparative Anatomy of the Vertebrates](#)

6 units from

- [BIOL 499 - Research Project](#)
- [EAS 426 - Undergraduate Thesis](#)

27 units from

Vertebrate Paleontology:

- [MA SC 412 - Biology of Fishes](#)
- [PALEO 400 - Paleontology Field School](#)
- [PALEO 418 - Paleobiology of the Vertebrates I](#)
- [PALEO 419 - Paleobiology of the Vertebrates II](#)
- [ZOOL 224 - Vertebrate Diversity](#)

- ZOOL 325 - Comparative Anatomy of the Vertebrates
- ZOOL 405 - Biology of Fishes
- ZOOL 406 - Biology of Amphibians and Reptiles
- ZOOL 407 - Biology of Birds
- ZOOL 408 - Biology of Mammals

Invertebrate Paleontology:

- BOT 205 - Fundamentals of Plant Biology
- BOT 308 - Plant Anatomy
- BOT 321 - Plant Diversity and Evolution
- EAS 110 - Earth Science Field School
- EAS 336 - Sedimentary Systems
- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 460 - Geobiology
- EAS 462 - Stratigraphy and Sedimentary Basins
- EAS 465 - Sedimentology
- ENT 220 - Insect Biology
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 410 - Marine Invertebrate Zoology
- ZOOL 250 - Survey of the Invertebrates

General:

- BIOL 315 - Biology: An Historical Perspective
- BIOL 361 - Marine Science
- BIOL 364 - Freshwater Ecology
- BIOL 398 - Research Project
- BIOL 399 - Research Project
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 498 - Research Project
- EAS 208 - Introduction to Global Change
- EAS 225 - Earth Surface Processes and Landforms
- EAS 270 - The Atmosphere
- EAS 320 - Geochemistry I
- EAS 373 - The Climate System
- EAS 421 - Structural Geology and Tectonics
- EAS 457 - Global Change
- PALEO 412 - Selected Topics in Paleontology
- PALEO 414 - Paleontology

6 units from

- any 400-level course with the following course designators:
 - EAS
 - PALEO

Notes

1. Of the 27 units required from the Vertebrate Paleontology, Invertebrate Paleontology or General lists, at least 12 units must be at the 300 level or higher and an additional 6 units must be at the 400 level.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.
4. Some courses are offered in alternate years only, so plan your schedule appropriately.

Major in Paleontology Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity

- CHEM 101 - Introductory University Chemistry I
- EAS 100 - Planet Earth
- EAS 105 - The Dynamic Earth Through Time
- STAT 151 - Introduction to Applied Statistics I

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 125 - Linear Algebra I
 - MATH 134 - Calculus for the Life Sciences I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I

Senior Courses

-
- BIOL 207 - Molecular Genetics and Heredity
 - BIOL 208 - Principles of Ecology
 - BIOL 221 - Mechanisms of Evolution
 - BIOL 335 - Principles of Systematics
 - EAS 222 - Stratigraphy and Sedimentation
 - EAS 230 - Introduction to Invertebrate Paleontology
 - EAS 233 - Geologic Structures
 - EAS 234 - Geology Field School

3 units from

-
- ZOOL 242 - Animal Physiology II: Intercellular Communication
 - ZOOL 250 - Survey of the Invertebrates

3 units from

-
- EAS 465 - Sedimentology
 - ZOOL 325 - Comparative Anatomy of the Vertebrates

21 units from

Vertebrate Paleontology:

- MA SC 412 - Biology of Fishes
- PALEO 400 - Paleontology Field School
- PALEO 418 - Paleobiology of the Vertebrates I
- PALEO 419 - Paleobiology of the Vertebrates II
- ZOOL 224 - Vertebrate Diversity
- ZOOL 325 - Comparative Anatomy of the Vertebrates
- ZOOL 405 - Biology of Fishes
- ZOOL 406 - Biology of Amphibians and Reptiles
- ZOOL 407 - Biology of Birds
- ZOOL 408 - Biology of Mammals

Invertebrate Paleontology:

- BOT 205 - Fundamentals of Plant Biology
- BOT 308 - Plant Anatomy
- BOT 321 - Plant Diversity and Evolution
- EAS 110 - Earth Science Field School
- EAS 336 - Sedimentary Systems
- EAS 364 - Petroleum Geology and Subsurface Methods
- EAS 460 - Geobiology
- EAS 462 - Stratigraphy and Sedimentary Basins
- EAS 465 - Sedimentology
- ENT 220 - Insect Biology
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 410 - Marine Invertebrate Zoology
- ZOOL 250 - Survey of the Invertebrates

General:

- BIOL 315 - Biology: An Historical Perspective
- BIOL 361 - Marine Science

- BIOL 364 - Freshwater Ecology
- BIOL 398 - Research Project
- BIOL 399 - Research Project
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 498 - Research Project
- EAS 208 - Introduction to Global Change
- EAS 225 - Earth Surface Processes and Landforms
- EAS 270 - The Atmosphere
- EAS 320 - Geochemistry I
- EAS 373 - The Climate System
- EAS 421 - Structural Geology and Tectonics
- EAS 457 - Global Change
- PALEO 412 - Selected Topics in Paleontology
- PALEO 414 - Paleontology

6 units from

- any 400-level course with the following course designators:
 - EAS
 - PALEO

Notes

1. Of the 21 units required from the Vertebrate Paleontology, Invertebrate Paleontology or General lists, at least 9 units must be at the 300 level or higher and an additional 3 units must be at the 400 level.
2. Some courses appear on more than one list. Students may not use the same course to satisfy more than one list requirement.
3. To fulfill the knowledge requirements for registration as a professional geoscientist (P. Geo.) through APEGA (Association of Professional Engineers and Geoscientists of Alberta), meet with an EAS program advisor to discuss appropriate course selections. Current syllabus and registration information is available from the Department of Earth & Atmospheric Sciences or APEGA. Full information is available at www.apega.ca.
4. Some courses are offered in alternate years only, so plan your schedule appropriately.

Bachelor of Science Pharmacology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Pharmacology](#) (66 units)
- [Major in Pharmacology](#) (51 units)
- [Minor in Pharmacology](#) (24 units)

Honors in Pharmacology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [BIOCH 200 - Introductory Biochemistry](#)
- [BIOCH 320 - Structure and Catalysis](#)

- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- PMCOL 200 - Drugs - An Introduction to Pharmacology
- PMCOL 303 - Introduction to Toxicology
- PMCOL 306 - Drug Disposition and Metabolism
- PMCOL 337 - Experimental Procedures in Pharmacology
- PMCOL 343 - Scientific Basis of Pharmacology: Part I
- PMCOL 344 - Scientific Basis of Pharmacology: Part II
- PMCOL 425 - Problem Solving Pharmacology & Therapeutics

6 units from

-
- PHYSL 210 - Human Physiology
 - PHYSL 212 - Human Physiology I **AND**
PHYSL 214 - Human Physiology II

15 units in either the

Thesis Stream: (See Note 2)

- PMCOL 497 - Honors Research Project in Pharmacology I (See Note 3)
- PMCOL 499 - Honors Research Project in Pharmacology II (See Note 3)

3 units from

-
- PMCOL 404 - Core Principles in Pharmacology
 - PMCOL 406 - Molecular Mechanisms of Drug Action
 - PMCOL 408 - Clinical Pharmacology
 - PMCOL 410 - Pharmacogenomics
 - PMCOL 412 - Drugs and the Nervous System
 - PMCOL 415 - Cardiovascular Pharmacology
 - PMCOL 450 - Diabetes and Its Pharmacotherapy
 - PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

OR

Non-Thesis Stream:

6 units from

-
- PMCOL 401 - Pharmacology Tutorial
 - PMCOL 402 - Pharmacology Tutorial
 - PMCOL 403 - Advanced Topics in Pharmacology

9 units from

-
- PMCOL 401 - Pharmacology Tutorial
 - PMCOL 402 - Pharmacology Tutorial
 - PMCOL 403 - Advanced Topics in Pharmacology
 - PMCOL 404 - Core Principles in Pharmacology
 - PMCOL 406 - Molecular Mechanisms of Drug Action
 - PMCOL 408 - Clinical Pharmacology
 - PMCOL 410 - Pharmacogenomics
 - PMCOL 412 - Drugs and the Nervous System
 - PMCOL 415 - Cardiovascular Pharmacology
 - PMCOL 450 - Diabetes and Its Pharmacotherapy
 - PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Notes

-
1. Students will not be permitted to take 400-level PMCOL courses unless all prerequisites have been met.
 2. At least one of PMCOL 301, 302, or comparable research experience, is a prerequisite for the Thesis Stream.
 3. Some courses appear in more than one list of courses. Students may not use the same course to satisfy more than one requirement.

4. Students who take PMCOL 497 and 499 may not take PMCOL 401 or PMCOL 402.

Major in Pharmacology Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOCH 320 - Structure and Catalysis
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- PMCOL 200 - Drugs - An Introduction to Pharmacology
- PMCOL 303 - Introduction to Toxicology
- PMCOL 306 - Drug Disposition and Metabolism
- PMCOL 343 - Scientific Basis of Pharmacology: Part I
- PMCOL 344 - Scientific Basis of Pharmacology: Part II

6 units from

- PHYSL 210 - Human Physiology
- PHYSL 212 - Human Physiology I **AND**
PHYSL 214 - Human Physiology II

6 units from

- PMCOL 401 - Pharmacology Tutorial (See Note 1)
- PMCOL 402 - Pharmacology Tutorial (See Note 1)
- PMCOL 403 - Advanced Topics in Pharmacology
- PMCOL 404 - Core Principles in Pharmacology
- PMCOL 406 - Molecular Mechanisms of Drug Action
- PMCOL 408 - Clinical Pharmacology
- PMCOL 410 - Pharmacogenomics
- PMCOL 412 - Drugs and the Nervous System
- PMCOL 415 - Cardiovascular Pharmacology
- PMCOL 450 - Diabetes and Its Pharmacotherapy
- PMCOL 475 - Signal Transduction Systems as Pharmacological Targets

Notes

1. Students in the Major in Pharmacology degree program may only complete one of PMCOL 401 or PMCOL 402.
2. Students will not be permitted to take 400-level PMCOL courses unless all prerequisites have been met.

Minor in Pharmacology Requirements

- BIOCH 200 - Introductory Biochemistry
- PMCOL 200 - Drugs - An Introduction to Pharmacology
- PMCOL 343 - Scientific Basis of Pharmacology: Part I
- PMCOL 344 - Scientific Basis of Pharmacology: Part II

6 units from

- PHYSL 210 - Human Physiology
- PHYSL 212 - Human Physiology I **AND**
PHYSL 214 - Human Physiology II

6 units from

- any 300- and 400-level PMCOL course

Notes

1. PMCOL 337 is not available to students completing a Minor in Pharmacology.
2. Students will not be permitted to take 400-level PMCOL courses unless all prerequisites have been met.

Bachelor of Science Physics Subject Area**General Information**

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Physics](#) (75 units)
- [Major in Physics](#) (54 units)
- [Minor in Physics](#) (24 units)

Honors in Physics Requirements**Foundation Courses**

- [MATH 102 - Applied Linear Algebra](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)
- [PHYS 144 - Newtonian Mechanics](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- [MA PH 251 - Differential Equations for Physics](#)
- [MA PH 343 - Classical Mechanics II](#)
- [MA PH 351 - Mathematical Methods for Physics I](#)
- [MATH 214 - Calculus III](#)
- [PHYS 234 - Introductory Computational Physics](#)
- [PHYS 244 - Classical Mechanics](#)
- [PHYS 271 - Introduction to Modern Physics](#)
- [PHYS 295 - Experimental Physics I](#)
- [PHYS 297 - Experimental Physics II](#)
- [PHYS 310 - Thermodynamics and Kinetic Theory](#)
- [PHYS 311 - Statistical Physics](#)
- [PHYS 362 - Optical Physics](#)
- [PHYS 372 - Quantum Mechanics I](#)
- [PHYS 381 - Electromagnetism I](#)
- [PHYS 397 - Projects in Experimental Physics](#)
- [PHYS 472 - Quantum Mechanics II](#)
- [PHYS 481 - Electromagnetism II](#)
- [PHYS 499 - Undergraduate Research Project](#)

6 units from

- any 400-level course with the following course designators:
 - ASTRO (See Note 1)
 - GEOPH (See Note 1)
 - MA PH

- PHYS

Notes

1. Students that take 3 units in a 400-level ASTRO or GEOPH course for this requirement will also be satisfying the Breadth from Within the Faculty of Science requirement.
2. Not all 200-, 300- and 400-level Physics courses are offered every year so students should plan accordingly.
3. Students interested in the Engineering-Physics program should consult [Engineering Physics](#) of the Faculty of Engineering section.

Major in Physics Requirements

Foundation Courses

- [MATH 102 - Applied Linear Algebra](#)
- [MATH 144 - Calculus for the Mathematical and Physical Sciences I](#)
- [MATH 146 - Calculus for the Mathematical and Physical Sciences II](#)
- [PHYS 144 - Newtonian Mechanics](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

- [MA PH 251 - Differential Equations for Physics](#)
- [MA PH 351 - Mathematical Methods for Physics I](#)
- [MATH 214 - Calculus III](#)
- [PHYS 234 - Introductory Computational Physics](#)
- [PHYS 244 - Classical Mechanics](#)
- [PHYS 271 - Introduction to Modern Physics](#)
- [PHYS 295 - Experimental Physics I](#)
- [PHYS 297 - Experimental Physics II](#)
- [PHYS 372 - Quantum Mechanics I](#)
- [PHYS 381 - Electromagnetism I](#)

3 units from

- [PHYS 310 - Thermodynamics and Kinetic Theory](#)
- [PHYS 362 - Optical Physics](#)

3 units from

- [PHYS 472 - Quantum Mechanics II](#)
- [PHYS 481 - Electromagnetism II](#)

3 units from

- any 400-level PHYS course

Notes

1. Not all 200-, 300- and 400-level Physics courses are offered every year so students should plan accordingly.
2. Students interested in the Engineering-Physics program should consult [Engineering Physics](#) of the Faculty of Engineering section.

Minor in Physics Requirements

Foundation Courses

3 units from

- [PHYS 124 - Particles and Waves](#)

- [PHYS 144 - Newtonian Mechanics](#)

3 units from

- [PHYS 126 - Fluids, Fields, and Radiation](#)
- [PHYS 146 - Relativity, Electricity and Magnetism](#)

Senior Courses

3 units from

- [PHYS 208 - Aspects of Modern Physics](#)
- [PHYS 271 - Introduction to Modern Physics](#)

3 units from

- [PHYS 294 - General Physics Laboratory](#)
- [PHYS 295 - Experimental Physics I](#)

6 units from

- any 200-, 300-, and 400-level course with the following course designators:
 - MA PH
 - PHYS

6 units from

- any 300- and 400-level PHYS course

Notes

1. Upper level PHYS courses may require specific MATH courses as prerequisites. These prerequisites must be considered when choosing Science options.
2. Not all 200-, 300- and 400-level Physics courses are offered every year so students should plan accordingly.

Bachelor of Science Physiology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Physiology \(90 units\)](#)
- [Major in Physiology \(72 units\)](#)

Honors in Physiology Requirements

Foundation Courses

- [BIOL 107 - Introduction to Cell Biology](#)
- [CHEM 101 - Introductory University Chemistry I](#)
- [CHEM 102 - Introductory University Chemistry II](#)
- [MATH 134 - Calculus for the Life Sciences I](#)
- [PHYS 124 - Particles and Waves](#)
- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOCH 320 - Structure and Catalysis
- BIOCH 330 - Nucleic Acids and Molecular Biology
- BIOL 207 - Molecular Genetics and Heredity
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- PHYSL 212 - Human Physiology I
- PHYSL 214 - Human Physiology II
- PHYSL 372 - Systems Neuroscience
- PMCOL 200 - Drugs - An Introduction to Pharmacology

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

3 units from

- ANAT 200 - Human Morphology
- PHYSL 310 - Experimental Techniques in Physiology

3 units from

- PMCOL 371 - Cellular Neuroscience
- ZOOL 342 - Neurobiology

24 units in either the

Thesis Stream:

- PHYSL 468 - Undergraduate Research Thesis I **AND**
- PHYSL 469 - Undergraduate Research Thesis II

OR

Non-Thesis Stream:

- PHYSL 467 - Undergraduate Research Project **OR**
PHYSL 463 - Advanced Topics in Physiology Research I **AND**
PHYSL 464 - Advanced Topics in Physiology Research II
- 6 units in 400-level PHYSL courses

6 units from

- any 400-level PHYSL course

15 units from

- ANAT 305 - Cross-Sectional Anatomy
- any 400-level ANAT course
- BIOL 310 - Biology of Aging
- BIOL 330 - Introduction to Biological Data
- BIOL 380 - Genetic Analysis of Populations
- BIOL 430 - Statistical Design and Analysis in Biology
- BIOL 445 - Current Topics in Animal and Cell Physiology
- BME 320 - Human Anatomy and Physiology: Cells and Tissue
- BME 321 - Human Anatomy and Physiology: Systems
- any 400- and 500-level BME course
- any 300-, 400-, and 500-level CELL course
- any 400- and 500-level NEURO course
- LABMP 400 - Introduction to Human Disease

- ONCOL 320 - Introduction to Oncology
- ONCOL 425 - Advanced Topics in Cancer Research
- any 400- and 500-level PHYSL course
- PMCOL 303 - Introduction to Toxicology
- PMCOL 305 - An Introduction to the Pharmacology of Drug Abuse
- PMCOL 412 - Drugs and the Nervous System
- PMCOL 415 - Cardiovascular Pharmacology
- PMCOL 416 - Current Topics in Endocrine Pharmacology
- PMCOL 475 - Signal Transduction Systems as Pharmacological Targets
- PSYCH 351 - Spatial Cognition
- PSYCH 354 - Foundations of Cognitive Science
- PSYCH 356 - Research Methods in Cognition
- PSYCH 367 - Perception
- PSYCH 372 - Behavior in Relation to Genetics
- PSYCH 375 - Introduction to Cognitive Neuroscience
- PSYCH 377 - Human Neuropsychology
- PSYCH 381 - Principles of Learning
- PSYCH 403 - Recent Advances in Experimental Psychology: Models and Theories
- PSYCH 413 - Design and Analysis of Experiments in Psychology
- PSYCH 471 - Neurophysiology: Theory, Methods, and Analysis
- PSYCH 473 - Advanced Topics in Neuroscience
- PSYCH 478 - Behavior and Brain Chemistry

Major in Physiology Requirements

Foundation Courses

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- MATH 134 - Calculus for the Life Sciences I
- PHYS 124 - Particles and Waves
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- BIOCH 200 - Introductory Biochemistry
- BIOCH 320 - Structure and Catalysis
- BIOCH 330 - Nucleic Acids and Molecular Biology
- BIOL 207 - Molecular Genetics and Heredity
- CHEM 261 - Organic Chemistry I
- CHEM 263 - Organic Chemistry II
- PHYSL 210 - Human Physiology
- PHYSL 372 - Systems Neuroscience
- PMCOL 200 - Drugs - An Introduction to Pharmacology

3 units from

- BIOL 201 - Eukaryotic Cellular Biology
- CELL 201 - Introduction to Molecular Cell Biology

3 units from

- ANAT 200 - Human Morphology
- BIOL 330 - Introduction to Biological Data

3 units from

- PMCOL 371 - Cellular Neuroscience
- ZOOL 342 - Neurobiology

9 units from

- any 400-level PHYSL course

6 units from

- ANAT 305 - Cross-Sectional Anatomy
- any 400-level ANAT course
- BIOL 310 - Biology of Aging
- BIOL 330 - Introduction to Biological Data
- BIOL 380 - Genetic Analysis of Populations
- BIOL 430 - Statistical Design and Analysis in Biology
- BIOL 445 - Current Topics in Animal and Cell Physiology
- BME 320 - Human Anatomy and Physiology: Cells and Tissue
- BME 321 - Human Anatomy and Physiology: Systems
- any 400- and 500-level BME course
- any 300-, 400-, and 500-level CELL course
- any 400- and 500-level NEURO course
- LABMP 400 - Introduction to Human Disease
- ONCOL 320 - Introduction to Oncology
- ONCOL 425 - Advanced Topics in Cancer Research
- any 400- and 500-level PHYSL course
- PMCOL 303 - Introduction to Toxicology
- PMCOL 305 - An Introduction to the Pharmacology of Drug Abuse
- PMCOL 412 - Drugs and the Nervous System
- PMCOL 415 - Cardiovascular Pharmacology
- PMCOL 416 - Current Topics in Endocrine Pharmacology
- PMCOL 475 - Signal Transduction Systems as Pharmacological Targets
- PSYCH 351 - Spatial Cognition
- PSYCH 354 - Foundations of Cognitive Science
- PSYCH 356 - Research Methods in Cognition
- PSYCH 367 - Perception
- PSYCH 372 - Behavior in Relation to Genetics
- PSYCH 375 - Introduction to Cognitive Neuroscience
- PSYCH 377 - Human Neuropsychology
- PSYCH 381 - Principles of Learning
- PSYCH 403 - Recent Advances in Experimental Psychology: Models and Theories
- PSYCH 413 - Design and Analysis of Experiments in Psychology
- PSYCH 471 - Neurophysiology: Theory, Methods, and Analysis
- PSYCH 473 - Advanced Topics in Neuroscience
- PSYCH 478 - Behavior and Brain Chemistry

Bachelor of Science Planning Subject Area**General Information**

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Planning](#) (96 units)
- [Major in Planning](#) (84 units)

Honors in Planning Requirements**Foundation Courses**

- [BIOL 108 - Introduction to Biological Diversity](#)
- [EAS 100 - Planet Earth](#)

- ECON 101 - Introduction to Microeconomics
- HGEO 100 - Introduction to Human Geography and Planning
- STAT 151 - Introduction to Applied Statistics I

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I

Senior Courses

-
- BIOL 208 - Principles of Ecology
 - EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
 - EAS 225 - Earth Surface Processes and Landforms
 - EAS 250 - Biogeography
 - EAS 351 - Environmental Applications of Geographical Information Systems
 - HGEO 240 - Cities and Urbanism
 - HGEO 250 - Sustainable Development and Environmental Management
 - PLAN 210 - Introductory Planning History and Practice
 - PLAN 211 - Introduction to Design Fundamentals for Planners
 - PLAN 310 - Land Use Planning and Policy
 - PLAN 315 - Community Planning and Engagement
 - PLAN 316 - Planning Law
 - PLAN 317 - Planning Theory
 - PLAN 355 - Environmental Planning
 - PLAN 399 - Research Methods in Planning
 - PLAN 410 - Professional Planning Practice and Ethics
 - PLAN 412 - Finance for Planners
 - PLAN 470 - Geographical Information Systems for Planning
 - PLAN 495 - Planning Studio

3 units from

-
- HGEO 381 - Topics In Human Geography
 - PLAN 485 - Advanced Topics in Planning

6 units from

-
- HGEO 496 - Undergraduate Thesis
 - HGEO 497 - Directed Study in Human Geography or Planning I (taken twice with two different topics)

12 units from

-
- BIOL 299 - Research Opportunity
 - BIOL 330 - Introduction to Biological Data
 - BIOL 331 - Population Ecology
 - BIOL 332 - Community Ecology
 - BIOL 333 - Wetland Science and Management
 - BIOL 364 - Freshwater Ecology
 - BIOL 365 - Methods in Freshwater Ecology
 - BIOL 366 - Northern Ecology
 - BIOL 381 - A Planet in Crisis
 - BIOL 464 - Limnology
 - BIOL 470 - Landscape Ecology
 - EAS 323 - Introduction to Hydrogeology
 - EAS 324 - Quaternary Geoscience and Terrain Analysis
 - EAS 327 - Environmental Instrumentation
 - EAS 401 - Science Internship Practicum
 - EAS 425 - Contaminant Hydrogeology
 - EAS 427 - Directed Study I
 - EAS 428 - Directed Study II
 - EAS 451 - Digital Remote Sensing
 - EAS 452 - Topics in Earth Observation Science
 - EAS 457 - Global Change
 - EAS 458 - Cold Regions Geoscience

Notes

1. WKEXP 955, WKEXP 956 are required for students entering the Science Internship Program.
2. PLAN 355, HGEO 381, PLAN 470 and PLAN 485 count as a Science courses in the Honors in Planning degree program.

Major in Planning Requirements

Foundation Courses

- BIOL 108 - Introduction to Biological Diversity
- EAS 100 - Planet Earth
- ECON 101 - Introduction to Microeconomics
- HGEO 100 - Introduction to Human Geography and Planning
- STAT 151 - Introduction to Applied Statistics I

3 units from

- MATH 117 - Honors Calculus I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I

Senior Courses

- BIOL 208 - Principles of Ecology
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing
- EAS 225 - Earth Surface Processes and Landforms
- EAS 250 - Biogeography
- EAS 351 - Environmental Applications of Geographical Information Systems
- HGEO 240 - Cities and Urbanism
- HGEO 250 - Sustainable Development and Environmental Management
- PLAN 210 - Introductory Planning History and Practice
- PLAN 211 - Introduction to Design Fundamentals for Planners
- PLAN 310 - Land Use Planning and Policy
- PLAN 315 - Community Planning and Engagement
- PLAN 316 - Planning Law
- PLAN 317 - Planning Theory
- PLAN 355 - Environmental Planning
- PLAN 399 - Research Methods in Planning
- PLAN 410 - Professional Planning Practice and Ethics
- PLAN 412 - Finance for Planners
- PLAN 470 - Geographical Information Systems for Planning
- PLAN 495 - Planning Studio

3 units from

- HGEO 381 - Topics In Human Geography
- PLAN 485 - Advanced Topics in Planning

6 units from

- BIOL 299 - Research Opportunity
- BIOL 330 - Introduction to Biological Data
- BIOL 331 - Population Ecology
- BIOL 332 - Community Ecology
- BIOL 333 - Wetland Science and Management
- BIOL 364 - Freshwater Ecology
- BIOL 365 - Methods in Freshwater Ecology
- BIOL 366 - Northern Ecology
- BIOL 381 - A Planet in Crisis
- BIOL 464 - Limnology
- BIOL 470 - Landscape Ecology
- EAS 323 - Introduction to Hydrogeology
- EAS 324 - Quaternary Geoscience and Terrain Analysis

- EAS 327 - Environmental Instrumentation
- EAS 401 - Science Internship Practicum
- EAS 425 - Contaminant Hydrogeology
- EAS 427 - Directed Study I
- EAS 428 - Directed Study II
- EAS 451 - Digital Remote Sensing
- EAS 452 - Topics in Earth Observation Science
- EAS 457 - Global Change
- EAS 458 - Cold Regions Geoscience

Notes

1. WKEXP 955, WKEXP 956 are required for students entering the Science Internship Program.
2. PLAN 355, HGEO 381, PLAN 470 and PLAN 485 count as a Science courses in the Major in Planning degree program.

Bachelor of Science Psychology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- Honors in Psychology (72 units)
- Major in Psychology (42 units)
- Minor in Psychology (27 units)

Honors in Psychology Requirements

Foundation Courses

- PSYCH 104 - Basic Psychological Processes
- PSYCH 105 - Individual and Social Behavior
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- PSYCH 212 - Introduction to Research Methods in Psychology
- PSYCH 309 - Honors Seminar I
- PSYCH 390 - Honors Thesis I: Research Apprenticeship (to be taken twice)
- PSYCH 409 - Honors Seminar II
- PSYCH 499 - Honors Thesis II: Thesis Research (to be taken twice)
- STAT 252 - Introduction to Applied Statistics II

6 units from

- PSYCH 223 - Lifespan Developmental Psychology
- PSYCH 239 - Abnormal Psychology
- PSYCH 241 - Social Psychology

6 units from

- PSYCH 258 - Cognitive Psychology
- PSYCH 275 - Brain and Behavior
- PSYCH 282 - Behavior Modification

3 units from

- PSYCH 303 - History of Ideas in Psychology
- PSYCH 304 - History of Modern Psychology

9 units from

- any 200-, 300-, and 400-level PSYCH course

9 units from

- any 300- and 400-level PSYCH course

6 units from

- any 400-level PSYCH course

Notes

1. Admission into the Honors Psychology program is contingent upon securing a research supervisor. Students planning to apply for admission should contact the Department of Psychology.

Major in Psychology Requirements

Foundation Courses

- PSYCH 104 - Basic Psychological Processes
- PSYCH 105 - Individual and Social Behavior
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

- STAT 252 - Introduction to Applied Statistics II

6 units from

- PSYCH 223 - Lifespan Developmental Psychology
- PSYCH 239 - Abnormal Psychology
- PSYCH 241 - Social Psychology

6 units from

- PSYCH 258 - Cognitive Psychology
- PSYCH 275 - Brain and Behavior
- PSYCH 282 - Behavior Modification

6 units from

- any 300- and 400-level PSYCH course

3 units from

- any 300- and 400-level PSYCH course offered by the Faculty of Arts

3 units from

- any 300- and 400-level PSYCH course offered by the Faculty of Science

3 units from

- any 400-level PSYCH course offered by the Faculty of Arts

3 units from

- any 400-level PSYCH course offered by the Faculty of Science

Minor in Psychology Requirements

Foundation Courses

- PSYCH 104 - Basic Psychological Processes
- PSYCH 105 - Individual and Social Behavior
- STAT 151 - Introduction to Applied Statistics I

Senior Courses

3 units from

- PSYCH 223 - Lifespan Developmental Psychology
- PSYCH 239 - Abnormal Psychology
- PSYCH 241 - Social Psychology

3 units from

- PSYCH 258 - Cognitive Psychology
- PSYCH 275 - Brain and Behavior
- PSYCH 282 - Behavior Modification

6 units from

- any 200-, 300-, and 400-level PSYCH course

3 units from

- any 300- and 400-level PSYCH course offered by the Faculty of Arts

3 units from

- any 300- and 400-level PSYCH course offered by the Faculty of Science

Bachelor of Science Statistics Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Honors in Statistics](#) (66 units)
- [Major in Statistics](#) (54 units)
- [Minor in Statistics](#) (24 units)

Honors in Statistics Requirements

Foundation Courses

- [CMPUT 174 - Introduction to the Foundations of Computation I](#) (See Note 1)

- COMPUT 175 - Introduction to the Foundations of Computation II (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

3 units from

- MATH 117 - Honors Calculus I
- MATH 134 - Calculus for the Life Sciences I
- MATH 144 - Calculus for the Mathematical and Physical Sciences I
- MATH 154 - Calculus for Business and Economics I

3 units from

- MATH 118 - Honors Calculus II
- MATH 136 - Calculus for the Life Sciences II
- MATH 146 - Calculus for the Mathematical and Physical Sciences II
- MATH 156 - Calculus for Business and Economics II

3 units from

- MATH 125 - Linear Algebra I
- MATH 127 - Honors Linear Algebra I

Senior Courses

- MATH 216 - Introduction to Analysis (See Note 2)
- MATH 217 - Honors Calculus III
- MATH 317 - Honors Calculus IV
- MATH 417 - Introduction to Measure Theory
- STAT 252 - Introduction to Applied Statistics II
- STAT 265 - Introduction to Probability
- STAT 266 - Introduction to Statistics
- STAT 371 - Probability and Stochastic Processes
- STAT 372 - Mathematical Statistics
- STAT 378 - Applied Regression Analysis
- STAT 471 - Probability I
- STAT 499 - Research Project

3 units from

- MATH 225 - Linear Algebra II
- MATH 227 - Honors Linear Algebra II

3 units from

- any 300- and 400-level STAT course

6 units from

- any 400-level STAT course

Notes

1. COMPUT 274 and COMPUT 275 can serve as substitutes for COMPUT 174 and 175, respectively.
2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.
4. ECON 299, ECON 386 or ECON 387 may not be used for credit in any Honors degree offered by the Department of Mathematical and Statistical Sciences.

Major in Statistics Requirements

Foundation Courses

- CMPUT 174 - Introduction to the Foundations of Computation I (See Note 1)
- CMPUT 175 - Introduction to the Foundations of Computation II (See Note 1)
- STAT 151 - Introduction to Applied Statistics I

3 units from

-
- MATH 117 - Honors Calculus I
 - MATH 134 - Calculus for the Life Sciences I
 - MATH 144 - Calculus for the Mathematical and Physical Sciences I
 - MATH 154 - Calculus for Business and Economics I

3 units from

-
- MATH 118 - Honors Calculus II
 - MATH 136 - Calculus for the Life Sciences II
 - MATH 146 - Calculus for the Mathematical and Physical Sciences II
 - MATH 156 - Calculus for Business and Economics II

3 units from

-
- MATH 125 - Linear Algebra I
 - MATH 127 - Honors Linear Algebra I

Senior Courses

-
- MATH 216 - Introduction to Analysis (See Note 2)
 - STAT 252 - Introduction to Applied Statistics II
 - STAT 265 - Introduction to Probability
 - STAT 266 - Introduction to Statistics
 - STAT 371 - Probability and Stochastic Processes
 - STAT 372 - Mathematical Statistics
 - STAT 378 - Applied Regression Analysis

3 units from

-
- MATH 214 - Calculus III
 - MATH 217 - Honors Calculus III

3 units from

-
- MATH 225 - Linear Algebra II
 - MATH 227 - Honors Linear Algebra II

3 units from

-
- any 300- or 400-level MATH course
 - any 300- or 400-level STAT course

6 units from

-
- any 400-level STAT course

Notes

-
1. CMPUT 274 and CMPUT 275 can serve as substitutes for CMPUT 174 and 175, respectively.
 2. Students that complete MATH 117 and MATH 118 can replace MATH 216 with 3 units selected from any 200-, 300-, and 400-level MATH course.
 3. With consent of the Department, students may substitute MATH 100 for MATH 117, MATH 134, MATH 144 or MATH 154; MATH 101 for MATH 118, MATH 136, MATH 146 or MATH 156; MATH 102 for MATH 125 or MATH 127.

Minor in Statistics Requirements

Foundation Courses

- [STAT 151 - Introduction to Applied Statistics I](#)

Senior Courses

- [STAT 252 - Introduction to Applied Statistics II](#)
- [STAT 265 - Introduction to Probability](#)
- [STAT 266 - Introduction to Statistics](#)
- [STAT 378 - Applied Regression Analysis](#)

6 units from

- any 200-, 300-, and 400-level STAT course

3 units from

- any 300- and 400-level STAT course

Bachelor of Science Agriculture Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Agriculture \(24 units\)](#)

Minor in Agriculture Requirements

Foundation Courses

- [AN SC 101 - Principles of Animal Agriculture](#)

Senior Courses

- [AREC 200 - Current Economic Issues for Agriculture and Food](#)
- [PL SC 221 - Introduction to Plant Science](#)
- [REN R 210 - Introduction to Soil Science](#)

12 units from

- any 300- and 400-level AN SC course
- any 300- and 400-level AREC course
- any 300- and 400-level ENSC course
- any 300- and 400-level PL SC course
- [REN R 307 - Environmental Assessment Principles and Methods](#)
- [REN R 360 - Soil and Water Conservation](#)
- [REN R 364 - Principles of Managing Natural Diversity](#)
- [REN R 376 - Fisheries and Wildlife Management](#)
- [REN R 441 - Soil Formation and Landscape Processes](#)
- [REN R 442 - Soil Biogeochemistry](#)
- [REN R 443 - Soil Physics](#)
- [REN R 444 - Environmental Soil Chemistry](#)
- [REN R 445 - Soil Fertility](#)
- [REN R 446 - Climates and Ecosystems](#)
- [REN R 462 - Parks, Ecology, and Society](#)

- REN R 464 - Conservation and Management of Endangered Species
- REN R 465 - Environmental and Conservation Field Studies
- REN R 467 - Environmental Interpretation and Science Communication
- REN R 474 - Utilization of Wildlife Resources
- REN R 476 - Advanced Fisheries and Wildlife Management
- REN R 482 - Soil Remediation
- REN R 483 - Waste Management and Utilization

Notes

1. Several of the above courses have one or more courses as prerequisites. These prerequisites must be met.

Bachelor of Science Business Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Business](#) (24 units)

Minor in Business Requirements

Foundation Courses

- [ECON 101 - Introduction to Microeconomics](#)
- [ECON 102 - Introduction to Macroeconomics](#)

Senior Courses

- [ACCTG 311 - Introduction to Accounting for Financial Performance](#)
- [SEM 301 - Behavior in Organizations](#)

6 units from

- [FIN 301 - Introduction to Finance](#)
- [MARK 301 - Introduction to Marketing](#)
- [OM 352 - Operations Management](#)
- [SEM 321 - Introduction to Strategic Management and Organization Design](#)

6 units from

- any 300- and 400-level course with the following course designators:
 - ACCTG
 - FIN
 - MARK
 - OM
 - SEM

Notes

1. Once admitted to the Minor in Business, students will be allowed to continue as long as they remain in satisfactory academic standing.

Bachelor of Science Human Ecology Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Human Ecology](#) (24 units)

Minor in Human Ecology Requirements

Foundation Courses

- [HECOL 100 - Introduction to Principles and Practice in Human Ecology](#)

Senior Courses

12 units from

- any HECOL course

9 units from

- any 300- and 400-level HECOL course

Notes

1. Several of the above courses have one or more courses as prerequisites. These prerequisites must be met.

Bachelor of Science Nutrition Subject Area

General Information

The subject area requirements listed on this page are part of the [Bachelor of Science](#).

To find a description about this area of study, please visit [Our Degrees](#) of the Faculty of Science webpage.

Requirements

- [Minor in Nutrition](#) (24 units)

Minor in Nutrition Requirements

Foundation Courses

- [NUTR 100 - Nutrition and Well-being](#)

Senior Courses

- [NU FS 305 - Introduction to the Principles of Nutrition](#)
- [NU FS 356 - Nutrition Across the Lifespan](#)
- [NU FS 373 - Food Chemistry](#)

12 units from

- [NUTR 380 - Sports Nutrition](#)
- [NU FS 200 - Introduction to Functional Foods and Nutraceuticals](#)
- [NU FS 223 - The Cultural Ecology of Food and Health](#)

- NU FS 363 - Food Microbiology
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Population and Public Health Nutrition
- NU FS 427 - Food Safety
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome

Notes

1. Several of the above courses have one or more courses as prerequisites. These prerequisites must be met.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Department of Biochemistry: September 20, 2022

Department of Biological Sciences: September 21, 2022

Department of Cell Biology: October 3, 2022

Department of Chemistry: September 27, 2022

Department of Computing Science: September 21, 2022

Department of Earth and Atmospheric Sciences: October 14, 2022

Department of Mathematical and Statistical Sciences: September 6, 2022

Department of Medical Microbiology and Immunology: September 24, 2022

Neuroscience and Mental Health Institute: September 28, 2022

Department of Pharmacology: September 28, 2022

Department of Physics: September 15, 2022

Department of Physiology: October 7, 2022

Department of Psychology: September 16, 2022

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. These are the course lists associated with the new "Breadth from Outside the Faculty of Science" common program requirement as described on the new [Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#) page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Breadth from Outside the Faculty of Science Course Lists for Bachelor of Science (Major and Honors)

Return to [Bachelor of Science \(Major and Honors\)](#)

Applied Sciences:

- INT D 280 - The Mountain World: Introduction to Interdisciplinary Mountain Studies
- any course with the following course designators:
 - AFNS
 - AN SC
 - BIOEN
 - CH E (see Note 1)

- CIV E (see Note 1)
- CME (see Note 1)
- ECE (see Note 1)
- ENG M (see Note 1)
- ENSC
- ENV E (see Note 1)
- FOREC
- HECOL
- HE ED
- KIN (excluding KIN 100, KIN 101, KIN 109, and KIN 391)
- KRLS
- MAT E (see Note 1)
- MEC E (see Note 1)
- MIN E (see Note 1)
- NU FS
- NUTR
- PET E (see Note 1)
- PL SC (excluding PL SC 221)
- REN R
- RLS
- SPH
- SUST

Business:

- **ENGG 260 - Innovation and Entrepreneurship with Engineers** (see Note 1)
- any course with the following course designators:
 - ACCTG
 - B LAW
 - BTM
 - BUEC
 - FIN
 - MARK
 - OM
 - SEM

Humanities, Fine Arts, and Performing Arts:

- **INT D 205 - Introduction to Ancient and Medieval Studies**
- **INT D 311 - Language Policy and Planning for Indigenous Language Communities**
- **INT D 318 - Technologies for Endangered Language Documentation**

- INT D 350 - Game Design Principles and Practice
- INT D 450 - Computers and Games
- any course with the following course designators:
 - ASL
 - ARAB
 - ART
 - C LIT
 - CATS
 - CHINA
 - CHRTC
 - CLASS
 - DANCE
 - DES
 - DRAMA
 - EASIA
 - FS
 - FREN
 - FOLK
 - GERM
 - GREEK
 - HADVC
 - HINDI
 - HIST
 - HUNG
 - ITAL
 - JAPAN
 - KOREA
 - LA ST
 - LATIN
 - MEAS
 - MLCS
 - MST
 - MUSIC
 - NORSE
 - NORW
 - PERS
 - PHIL
 - POLSH
 - PORT
 - RELIG
 - RUSS
 - SCAND
 - SLAV

- SPAN
- SPRIT
- SWED
- T DES
- UKR
- WRITE

Social Sciences:

- INT D 135 - Popular Representations of Leadership
- INT D 248 - Loneliness Matters
- INT D 249 - The Science of Joy and Happiness
- INT D 250 - Survey Course on Cannabis
- INT D 301 - Foundations of Leadership
- INT D 303 - Economics of World Food and Agriculture
- INT D 306 - Leadership for Social Innovation
- INT D 340 - Regional Planning
- INT D 345 - Rural Environments
- INT D 375 - Intercultural Exploration of Health and Practice in Italy
- INT D 394 - Introduction to Criminal Law
- INT D 403 - Foundations of Collaborative Practice
- INT D 404 - Global Citizenship: Contemporary Issues and Perspectives
- INT D 407 - Workshop in Leadership
- INT D 408 - Interprofessional Health Education Elective
- INT D 439 - Ukrainian Dance
- INT D 457 - Global Health - China Collaboration
- any course with the following course designators:
 - ANTHR
 - CSL
 - ECON (excluding ECON 299)
 - HGEO
 - LING
 - NS
 - PLAN
 - POL S
 - PSYCH (excluding PSYCH courses offered by the Faculty of Science)
 - SOC (excluding SOC 210)
 - STS
 - WGS

Notes

1. With permission of the instructor, department offering the course, and/or Faculty of Engineering.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. These are the course lists associated with the new "Breadth from Within the Faculty of Science" common program requirement as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Breadth from Within the Faculty of Science Course Lists for Bachelor of Science (Major and Honors)

Return to [Bachelor of Science \(Major and Honors\)](#)

Basic Sciences:

(i.e. common high school course offerings)

- [BIOL 107 - Introduction to Cell Biology](#)
- [BIOL 108 - Introduction to Biological Diversity](#)
- any course with the following course designators:
 - CHEM
 - PHYS

Formal Sciences:

(i.e. primarily numerical in nature or based in logic)

- any course with the following course designators:
 - CMPUT
 - MA PH
 - MATH
 - STAT

Specialized Sciences:

(i.e. uncommon high school course offerings)

- any course with the following course designators:
 - ANAT
 - ASTRO
 - BIOCH
 - BIOIN
 - BIOL (at the 200 level or higher)
 - BIOPH
 - BOT
 - CELL
 - EAS
 - ENT
 - GENET
 - GEOPH
 - IMIN
 - MA SC
 - MICRB
 - MMI (excluding MMI 100 and MMI 133)
 - NEURO
 - PALEO
 - PHYSL
 - PMCOL
 - PSYCH (excluding PSYCH courses offered by the Faculty of Arts)
 - ZOOL

Notes

1. Science AP, IB, and GCE courses and science courses accepted for transfer credit (excluding Sci Opt 1XX) may be used to satisfy the Breadth from Within the Faculty of Science requirement.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. This is the course list associated with the new "Lab/Field Experience" common program requirement as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Lab/Field Experience Course List for Bachelor of Science (Major and Honors)

Return to [Bachelor of Science \(Major and Honors\)](#)

-
- BIOL 107 - Introduction to Cell Biology
 - BIOL 108 - Introduction to Biological Diversity
 - CHEM 101 - Introductory University Chemistry I
 - EAS 100 - Planet Earth
 - EAS 105 - The Dynamic Earth Through Time
 - PHYS 124 - Particles and Waves
 - PHYS 144 - Newtonian Mechanics

Notes

1. Science courses at the 200 level or higher with a scheduled lab component may also satisfy this requirement; students must consult an Academic Advisor for an approved course substitution.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. This is the Ecology, Evolution and Diversity course list for the Bachelor of Science Biological Sciences Subject Area as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Ecology, Evolution and Diversity Course List for Bachelor of Science Biological Sciences Subject Area

Return to [Bachelor of Science \(Major and Honors\)](#)

-
- [BIOIN 301 - Bioinformatics I](#)
 - [BIOIN 401 - Bioinformatics II](#)
 - [BIOL 221 - Mechanisms of Evolution](#)
 - [BIOL 321 - Mechanisms of Evolution](#)
 - [BIOL 322 - Diversity and Evolution of Microbial Life](#)
 - [BIOL 330 - Introduction to Biological Data](#)
 - [BIOL 331 - Population Ecology](#)

- BIOL 332 - Community Ecology
- BIOL 333 - Wetland Science and Management
- BIOL 335 - Principles of Systematics
- BIOL 340 - Global Biogeochemistry
- BIOL 341 - Ecotoxicology
- BIOL 361 - Marine Science
- BIOL 364 - Freshwater Ecology
- BIOL 365 - Methods in Freshwater Ecology
- BIOL 366 - Northern Ecology
- BIOL 367 - Conservation Biology
- BIOL 380 - Genetic Analysis of Populations
- BIOL 381 - A Planet in Crisis
- BIOL 384 - Global Change and Ecosystems
- BIOL 392 - Laboratory Techniques in Molecular Ecology and Systematics
- BIOL 395 - Field Course in Biology
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 430 - Statistical Design and Analysis in Biology
- BIOL 432 - Field Methods in Ecology
- BIOL 433 - Plant-Animal Interactions
- BIOL 434 - Chemical Ecology
- BIOL 440 - Watershed Ecohydrology
- BIOL 468 - Problems in Conservation Biology
- BIOL 471 - Landscape Ecology
- BOT 205 - Fundamentals of Plant Biology
- BOT 306 - Biology of the Fungi
- BOT 314 - Biology of Bryophytes
- BOT 321 - Plant Diversity and Evolution
- BOT 322 - Field Botany
- BOT 330 - Biodiversity and Ecosystem Function of Algae
- BOT 332 - Plant Ecology
- BOT 384 - Global Change and Ecosystems
- BOT 411 - Paleobotany
- ENT 207 - Agricultural Entomology
- ENT 220 - Insect Biology
- ENT 222 - Insects in Managed Ecosystems
- ENT 327 - Terrestrial Arthropod Diversity
- ENT 378 - Insect Pathology
- ENT 380 - Forest Entomology
- ENT 401 - Current Topics in Arthropod Biology
- ENT 427 - Terrestrial Arthropod Diversity
- IMIN 401 - Comparative Immunology
- IMIN 410 - Bioinformatics for Molecular Biologists
- MA SC 410 - Marine Invertebrate Zoology (6 units)
- MA SC 412 - Biology of Fishes
- MA SC 415 - Structure and Function in Animals
- MA SC 420 - Biodiversity of Marine Algae (6 units)
- MA SC 425 - Ecological Adaptations of Seaweeds
- MA SC 430 - Marine Ecology

- MA SC 437 - Marine Population Ecology and Dynamics
- MA SC 440 - Biology of Marine Birds (6 units)
- MA SC 445 - Biology of Marine Mammals (6 units)
- MICRB 320 - Microbial Ecology
- MICRB 392 - Environmental Microbiology Laboratory
- MICRB 423 - Extreme Microbiology
- MICRB 491 - Environmental Microbiology
- MICRB 492 - Environmental Microbiology Laboratory
- PALEO 201 - Dinosaurs in the Fossil Record
- PALEO 400 - Paleontology Field School
- PALEO 418 - Paleobiology of the Vertebrates I
- PALEO 419 - Paleobiology of the Vertebrates II
- ZOOL 224 - Vertebrate Diversity
- ZOOL 250 - Survey of the Invertebrates
- ZOOL 325 - Comparative Anatomy of the Vertebrates
- ZOOL 340 - Comparative Environmental Physiology
- ZOOL 351 - Freshwater Invertebrate Diversity
- ZOOL 352 - Principles of Parasitism
- ZOOL 370 - Ethological Mechanisms
- ZOOL 371 - Behavioral Ecology
- ZOOL 405 - Biology of Fishes
- ZOOL 406 - Biology of Amphibians and Reptiles
- ZOOL 407 - Biology of Birds
- ZOOL 408 - Biology of Mammals
- ZOOL 472 - Current Problems in Behavioral Ecology

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. This is the Genetics and Molecular Biology or Microbiology course list for the Bachelor of Science Biological Sciences Subject Area as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Genetics and Molecular Biology or Microbiology Course List for Bachelor of Science Biological Sciences Subject Area

Return to [Bachelor of Science \(Major and Honors\)](#)

-
- [BIOIN 301 - Bioinformatics I](#)
 - [BIOIN 401 - Bioinformatics II](#)
 - [BIOL 322 - Diversity and Evolution of Microbial Life](#)
 - [BIOL 343 - Techniques for Macromolecular Characterization](#)
 - [BIOL 380 - Genetic Analysis of Populations](#)
 - [BIOL 391 - Techniques in Molecular Biology and Bioinformatics](#)
 - [BIOL 392 - Laboratory Techniques in Molecular Ecology and Systematics](#)

- BIOL 421 - Molecular Evolution and Systematics
- BOT 382 - Plant Biotechnology
- BOT 445 - Molecular Plant Physiology
- BOT 464 - Plant Functional Genomics
- GENET 270 - Foundations of Molecular Genetics
- GENET 301 - Molecular Genetics of the Eukaryotic Cell
- GENET 302 - Genetics of Eukaryotic Chromosomes
- GENET 304 - Gene Expression and its Regulation
- GENET 305 - Genetic Analysis
- GENET 364 - Plant Genetics
- GENET 375 - Introduction to Molecular Genetics Techniques
- GENET 390 - Gene Manipulation
- GENET 408 - Replication, Repair, and Recombination
- GENET 415 - Current Topics in Bacterial Genetics
- GENET 418 - Human Genetics
- GENET 420 - Research Techniques in Molecular Genetics (6 units)
- GENET 422 - Current Topics in Developmental Genetics
- GENET 424 - Ethical Issues in Genetics
- MICRB 265 - General Microbiology
- MICRB 311 - Microbial Physiology
- MICRB 315 - Applied Microbiology and Biotechnology
- MICRB 316 - Molecular Microbiology
- MICRB 343 - Analysis of Microbial Macromolecules
- MICRB 345 - Microbial Laboratory Techniques
- MICRB 410 - Bacterial Structure and Virulence Factors
- MICRB 423 - Extreme Microbiology

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. This is the Physiology, Cell and Developmental Biology course list for the Bachelor of Science Biological Sciences Subject Area as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Physiology, Cell and Developmental Biology Course List for Bachelor of Science Biological Sciences Subject Area

Return to [Bachelor of Science \(Major and Honors\)](#)

-
- [BIOIN 301 - Bioinformatics I](#)
 - [BIOIN 401 - Bioinformatics II](#)
 - [BIOL 310 - Biology of Aging](#)
 - [BIOL 341 - Ecotoxicology](#)
 - [BIOL 391 - Techniques in Molecular Biology and Bioinformatics](#)
 - [BIOL 409 - Zoonoses](#)
 - [BIOL 445 - Current Topics in Animal and Cell Physiology](#)

- BOT 303 - Plant Development
- BOT 308 - Plant Anatomy
- BOT 340 - Plant Physiology
- BOT 380 - Drug Plants
- BOT 445 - Molecular Plant Physiology
- ENT 321 - Insect Physiology
- ENT 378 - Insect Pathology
- ENT 392 - Medical and Veterinary Entomology
- GENET 375 - Introduction to Molecular Genetics Techniques
- GENET 412 - Genetic Control of Animal Development
- IMIN 200 - Infection and Immunity
- IMIN 324 - Basic Virology
- IMIN 371 - Introduction to Immunology
- IMIN 372 - Research Techniques in Immunology
- IMIN 401 - Comparative Immunology
- IMIN 405 - Innate Immunity
- IMIN 410 - Bioinformatics for Molecular Biologists
- IMIN 410 - Bioinformatics for Molecular Biologists
- IMIN 452 - Advanced Immunology
- MA SC 415 - Structure and Function in Animals
- ZOOL 241 - Animal Physiology I: Homeostasis
- ZOOL 242 - Animal Physiology II: Intercellular Communication
- ZOOL 303 - Animal Developmental Biology
- ZOOL 340 - Comparative Environmental Physiology
- ZOOL 342 - Neurobiology
- ZOOL 343 - Comparative Endocrinology
- ZOOL 344 - Laboratory Exercises in Animal Physiology
- ZOOL 350 - Biology and Evolution of Invertebrates
- ZOOL 352 - Principles of Parasitism
- ZOOL 370 - Ethological Mechanisms
- ZOOL 402 - Current Topics in Developmental Biology
- ZOOL 441 - Current Topics on Homeostasis
- ZOOL 442 - Current Topics in Intercellular Communication
- ZOOL 450 - Biology and Evolution of Invertebrates
- ZOOL 452 - Topics in Parasitology

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. These are the course lists associated with the Bachelor of Science Ecology, Evolution and Environmental Biology Subject Area as described on the new "[Bachelor of Science \(Majors and Honors - Effective Fall 2024\)](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Course Lists A - E for Bachelor of Science Ecology, Evolution & Environmental Biology Subject Area

Return to [Bachelor of Science \(Major and Honors\)](#)

EE&E List A - Biological Diversity:

- [BIOL 332 - Community Ecology](#)
- [BIOL 361 - Marine Science](#)
- [BIOL 395 - Field Course in Biology \(if appropriate topic\)](#)
- [BIOL 495 - Special Topics in Biology \(if appropriate topic\)](#)
- [BOT 205 - Fundamentals of Plant Biology](#)
- [BOT 306 - Biology of the Fungi](#)
- [BOT 314 - Biology of Bryophytes](#)

- BOT 321 - Plant Diversity and Evolution
- BOT 330 - Biodiversity and Ecosystem Function of Algae
- BOT 411 - Paleobotany
- ENT 220 - Insect Biology
- ENT 222 - Insects in Managed Ecosystems
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 402 - Special Topics in Marine Biology (if appropriate topic)
- MA SC 410 - Marine Invertebrate Zoology
- MA SC 412 - Biology of Fishes
- MICRB 265 - General Microbiology
- PALEO 201 - Dinosaurs in the Fossil Record
- ZOOL 224 - Vertebrate Diversity
- ZOOL 250 - Survey of the Invertebrates
- ZOOL 351 - Freshwater Invertebrate Diversity
- ZOOL 352 - Principles of Parasitism
- ZOOL 405 - Biology of Fishes
- ZOOL 406 - Biology of Amphibians and Reptiles
- ZOOL 407 - Biology of Birds
- ZOOL 408 - Biology of Mammals

EE&E List B - Biological Processes:

- BIOL 310 - Biology of Aging
- BIOL 495 - Special Topics in Biology (if appropriate topic)
- BOT 303 - Plant Development
- BOT 308 - Plant Anatomy
- BOT 340 - Plant Physiology
- GENET 270 - Foundations of Molecular Genetics
- GENET 305 - Genetic Analysis
- GENET 364 - Plant Genetics
- IMIN 200 - Infection and Immunity
- IMIN 324 - Basic Virology
- MA SC 415 - Structure and Function in Animals
- MICRB 311 - Microbial Physiology
- ZOOL 241 - Animal Physiology I: Homeostasis
- ZOOL 242 - Animal Physiology II: Intercellular Communication
- ZOOL 303 - Animal Developmental Biology
- ZOOL 340 - Comparative Environmental Physiology
- ZOOL 452 - Topics in Parasitology

EE&E List C - Ecology and Environmental Biology:

- BIOL 331 - Population Ecology
- BIOL 332 - Community Ecology
- BIOL 333 - Wetland Science and Management
- BIOL 340 - Global Biogeochemistry

- BIOL 341 - Ecotoxicology
- BIOL 361 - Marine Science
- BIOL 364 - Freshwater Ecology
- BIOL 366 - Northern Ecology
- BIOL 367 - Conservation Biology
- BIOL 381 - A Planet in Crisis
- BIOL 384 - Global Change and Ecosystems
- BIOL 433 - Plant-Animal Interactions
- BIOL 434 - Chemical Ecology
- BIOL 440 - Watershed Ecohydrology
- BIOL 468 - Problems in Conservation Biology
- BIOL 471 - Landscape Ecology
- BIOL 495 - Special Topics in Biology (if appropriate topic)
- BOT 330 - Biodiversity and Ecosystem Function of Algae
- BOT 332 - Plant Ecology
- MA SC 401 - Special Topics in Marine Biology (if appropriate topic)
- MA SC 402 - Special Topics in Marine Biology (if appropriate topic)
- MA SC 425 - Ecological Adaptations of Seaweeds
- MA SC 430 - Marine Ecology
- MA SC 437 - Marine Population Ecology and Dynamics
- MICRB 320 - Microbial Ecology
- MICRB 423 - Extreme Microbiology
- MICRB 491 - Environmental Microbiology
- ZOOL 371 - Behavioral Ecology

EE&E List D - Evolution and Systematics:

- BIOL 322 - Diversity and Evolution of Microbial Life
- BIOL 335 - Principles of Systematics
- BIOL 380 - Genetic Analysis of Populations
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 495 - Special Topics in Biology (if appropriate topic)
- ENT 327 - Terrestrial Arthropod Diversity
- MA SC 402 - Special Topics in Marine Biology (if appropriate topic)
- PALEO 414 - Paleontology
- PALEO 418 - Paleobiology of the Vertebrates I
- PALEO 419 - Paleobiology of the Vertebrates II
- ZOOL 325 - Comparative Anatomy of the Vertebrates
- ZOOL 350 - Biology and Evolution of Invertebrates

EE&E List E - Scientific Methodology:

- BIOIN 301 - Bioinformatics I
- BIOIN 401 - Bioinformatics II
- BIOL 330 - Introduction to Biological Data

- BIOL 335 - Principles of Systematics (if appropriate topic)
- BIOL 392 - Laboratory Techniques in Molecular Ecology and Systematics
- BIOL 395 - Field Course in Biology
- BIOL 421 - Molecular Evolution and Systematics
- BIOL 430 - Statistical Design and Analysis in Biology
- ENT 327 - Terrestrial Arthropod Diversity
- IMIN 410 - Bioinformatics for Molecular Biologists
- MA SC 402 - Special Topics in Marine Biology (if appropriate topic)
- MICRB 315 - Applied Microbiology and Biotechnology
- MICRB 392 - Environmental Microbiology Laboratory
- PALEO 400 - Paleontology Field School
- ZOOL 350 - Biology and Evolution of Invertebrates
- ZOOL 351 - Freshwater Invertebrate Diversity

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

These proposed changes accompany the BSc Renewal Project, which focuses on updating and revamping the way programs and degrees are structured in the Faculty of Science. The main result of the BSc Renewal project is the shift from three program levels (General, Specialization and Honors) to two program levels (Major and Honors), which will address many of the structural and procedural issues that have developed over the past 25 years or so. It benefits all Science students and departments by providing a more coherent and logical degree framework. The associated processes, policies, requirements, and regulations have also been reviewed and updated to maximize clarity and consistency, as well as reduce administrative overhead. These changes must appear in the 2023-2024 calendar year in order to inform applicants of the new admission requirements in effect for Fall 2024.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): https://calendar.ualberta.ca/content.php?catoid=36&navoid=11306	
Current Faculty of Science Admission Requirements	Proposed Faculty of Science Admission Requirements Note: Starting Fall 2024, students admitted into the Faculty of Science are subject to the requirements and regulations associated with the new Major/Honors degree structure (see Bachelor of Science (Major and Honors) - Effective Fall 2024 for more information).

Admission to the Faculty of Science is competitive. Presentation of the minimum admission requirements and average does not guarantee admission to any given subject area (see [Undergraduate Admission, Admission Decision Process](#)). Applicants will be assessed on the basis of their academic records as described below.

- [BSc General Admission Requirements](#)
- [BSc General – Minor in Business](#)
- [BSc Honors and BSc Specialization Admission Requirements](#)
- [BSc/BEd – Bachelor of Science \(Specialization in Science and Education\) and Bachelor of Education \(Secondary\) Combined Degrees](#)
- [Postsecondary Transfer Students](#)
- [Indigenous Applicants](#)
- [Visiting Students](#)
- [Special Students](#)

Admission to the Faculty of Science is competitive. The number of high school and transfer admissions or readmissions to the Faculty is limited. Presentation of the minimum admission requirements and average does not guarantee admission. (See [Undergraduate Admission, Admission Decision Process](#)) Applicants will be assessed on the basis of their academic records as described below.

Grade 12 courses listed below are based on the Alberta Education curriculum.

Required Grade 12 Admission Subjects

1. English Language Arts 30-1.
2. Mathematics 30-1.
3. Two of Biology 30; Chemistry 30; Mathematics 31; Physics 30; Computing Science (CSE) Advanced Level Career and Technology Studies (CTS).
4. Subject from Group A, B, or C

Note: Only 5-credit courses will be used for admission purposes.

Applicants to the BSc (Specialization in Science and Education) and BEd (Secondary) Combined Degree must present Biology 30 and Chemistry 30.

Note: Applicants should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see the [Bachelor of Science Course Pre-requisites webpage](#) for more information.

- [Bachelor of Science \(Major and Honors\)](#)
- [Bachelor of Science \(Specialization in Science and Education\) and Bachelor of Education \(Secondary\) Combined Degrees](#)
- [Indigenous Applicants](#)
- [Visiting Students](#)
- [Special Students](#)

BSe General Admission Requirements

High School Applicants

High school applicants will be considered for admission based on their average on the required five admission subjects outlined [above](#). See [High School Applicants](#) for minimum grade and admission average requirements.

Bachelor of Science (Major and Honors)

The Bachelor of Science degree is designed to provide students with a diversified education and specialization in at least one subject area. Students in the Bachelor of Science degree must declare a Major subject area, and may declare a Minor subject area. Students in certain subject areas may declare a second Major subject area (from a list of eligible subject areas).

Alternatively, students may choose to complete a Bachelor of Science with Honors degree, which provides a challenging and rewarding learning experience within a subject area. It offers a greater depth of engagement, including a research or capstone experience, and demands a higher standard of performance. Students following this degree must declare an Honors subject area. They may declare a Minor subject area; they may not declare a second Major or Honors subject area.

Notes:

1. Certain subject areas are under enrolment management and therefore are competitive. Presentation of the minimum GPAs does not guarantee admission into these subject areas.
2. For information on transfer credit and credit by special assessment, see the corresponding section under [Faculty of Science Regulations](#).
3. Albertan applicants may be given preference for admission to the Planning subject area (Major and Honors).
4. For admission into BA or BA (Honors) in Mathematics or Psychology please see [Bachelor of Arts](#) or [Bachelor of Arts Honors](#), respectively.

- [High School Applicants](#)
- [Postsecondary Transfer Applicants](#)
- [After Degree Applicants](#)

High School Applicants

High school applicants will be considered for admission based on their average on the required five admission subjects outlined [below](#). See [High School Applicants](#) for minimum grade and admission average requirements. Grade 12 courses listed below are based on the Alberta Education curriculum.

Required Grade 12 Admission Subjects for Bachelor of Science:

1. English Language Arts 30-1

2. Mathematics 30-1
3. Two of Biology 30; Chemistry 30; Mathematics 31; Physics 30; Computing Science (CSE) Advanced Level-Career and Technology Studies (CTS)
4. Subject from Group A, B, or C

Notes:

1. Only 5-credit courses will be used for admission purposes.
2. High school applicants should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see the [Bachelor of Science Course Pre-requisites webpage](#) for more information.
3. Consideration for the Bachelor of Science with Honors degree requires a minimum application average of 80% on the required five admission subjects outlined above. Students need not apply to the Honors program in the first year and may instead apply to the corresponding Major. Students may then apply in any subsequent year to switch into an Honors program by submitting a Statement of Major/Minor/Honors form to the Faculty of Science by the application deadline.

This section is being deleted (we are no longer considering nonmatriculated applicants differently from high school applicants)

Nonmatriculated Applicants

Nonmatriculated applicants are considered for admission based on their average on the three admission subjects noted below:

Required Admission Subjects

1. Mathematics 30-1;
2. Two of Biology 30; Chemistry 30; Mathematics 31; Physics 30; Computing Science (CSE) Advanced Level-Career and Technology Studies (CTS);
3. Presentation of Faculty competitive average on (1) and (2);
4. Presentation of no more than 6 units of postsecondary level course work. Any applicant who has completed more than 6 units of postsecondary level course work will be considered a transfer applicant.
5. Presentation of minimum competitive AGPA on any postsecondary level course work presented:

Note: Only 5 credit courses will be used for admission purposes.

Other Requirements

1. A minimum passing grade in each admission subject is required.
2. See also general nonmatriculated requirements [Nonmatriculated Applicants](#).

Note: Nonmatriculated applicants are only eligible for consideration to the BSc-General program. Successful applicants may apply to transfer to other programs after completion of at least one Fall/Winter in the BSc-General program.

Postsecondary Transfer Applicants

A transfer applicant is any applicant who has ever registered at any postsecondary institution.

See [Postsecondary Transfer Students](#) for information pertaining to the admission and readmission of postsecondary transfer applicants.

Postsecondary Transfer Applicants

This section applies to applicants with previous postsecondary education who are not currently registered in the Faculty of Science. Students currently registered in the Faculty of Science should see [Faculty of Science Regulations - Internal Changes to Program and/or Subject Area](#).

Applicants must meet the admission subject requirements as outlined in [Required Grade 12 Admission Subjects](#) to be eligible for consideration.

Applicants with 6 units or less of transferable postsecondary work will be considered for admission as a High School Applicant (see [High School Applicants](#)).

Applicants who have successfully completed more than 6 units and less than 24 units of course weight transferable to the University of Alberta will be considered for admission on the basis of both their high school average (see [High School Applicants](#)) and their postsecondary Grade Point Averages as outlined in [Minimum Grade Point Averages and Additional Criteria](#).

Applicants with satisfactory standing in the Faculty of Science who discontinued their postsecondary education for at least one year will be readmitted.

Applicants with marginal standing in the Faculty of Science who discontinued their postsecondary education for at least one year will be readmitted to a Major program on academic warning (see Academic Standing).

Applicants who have never been required to withdraw (or equivalent by the standards of the Faculty of Science) in their postsecondary education and who have successfully

completed 24 units of course weight or more transferable to the University of Alberta may be considered for (re)admission on the basis of their postsecondary Grade Point Averages as outlined in [Minimum Grade Point Averages and Additional Criteria](#).

Applicants with one previous requirement to withdraw from the Faculty of Science who have discontinued their postsecondary education for at least one year will be readmitted to a Major program on probation, subject to terms specified by the Associate Dean, Undergraduate.

Applicants with one previous requirement to withdraw (or the equivalent by the standards of the Faculty of Science) in their postsecondary education and who have chosen to requalify for admission by taking further postsecondary work (including the Fresh Start Program) may be considered for Fall admission or readmission. Subsequent to having been required to withdraw, such applicants must present 24 units of course weight transferable to the University of Alberta. Consideration for (re)admission will be on the basis of their postsecondary Grade Point Averages as outlined in [Minimum Grade Point Averages and Additional Criteria](#).

Applicants who have been required to withdraw two times (or the equivalent by the standards of the Faculty of Science) are ineligible for (re)admission to the Faculty of Science, except when the second requirement to withdraw was issued by the Faculty of Science (see Academic Standing).

Applicants who have been required to withdraw three times (or the equivalent by the standards of the Faculty of Science) are ineligible for (re)admission to the Faculty of Science.

Applicants who have been expelled from any postsecondary institution are ineligible for admission to the Faculty of Science.

Minimum Grade Point Averages and Additional Criteria

Major - all subject areas except Mathematics and Finance:

1. A minimum 2.0 AGPA and
2. A minimum 2.3 GPA on 200 level or higher [Subject Area Courses](#) or their equivalents (if 9 units or more at the 200 level or higher in the subject area have been successfully completed). For applicants seeking to complete a double major, a minimum 2.3 GPA is required for each subject area.

Major - Mathematics and Finance subject area:

1. For Year 2 entry, a minimum 2.7 AGPA and a minimum 2.7 GPA on the following courses (or their equivalents):

- ECON 101
- ECON 102
- MATH 125
- MATH 154
- MATH 156
- STAT 161
- 6 units in ENGL or WRS

2. For Year 3 entry, a minimum 2.7 AGPA, completion of 60 units, and a minimum 2.7 GPA on the following courses (or their equivalents):

- ECON 101
- ECON 102
- ECON 281
- MATH 125
- MATH 154
- MATH 156
- MATH 214
- MATH 215
- MATH 225
- MATH 253
- STAT 161
- STAT 265
- STAT 266
- 6 units in ENGL or WRS

Honors - all subject areas except Mathematics and Finance, Neuroscience, Planning, and Psychology:

1. A minimum 3.0 AGPA and
2. A minimum 3.0 GPA on 200 level or higher [Subject Area Courses](#) or their equivalents (if 9 units or more at the 200 level or higher in the subject area have been successfully completed).

Honors - Mathematics and Finance:

1. For Year 2 entry, a minimum 3.0 AGPA and a minimum 3.0 GPA on the following courses (or their equivalents):

- ECON 101
- ECON 102
- MATH 117
- MATH 118
- MATH 127
- STAT 161
- 6 units in ENGL or WRS

2. For Year 3 entry, a minimum 3.0 AGPA, completion of 60 units, and a minimum 3.0 GPA on the following courses (or their equivalents):

- ECON 101
- ECON 102
- ECON 281

<p>After Degree Applicants</p> <p>After Degree applicants must declare a major and minor on application to the program (see Science After Degrees).</p>	<p>MATH 117 MATH 118 MATH 127 MATH 217 MATH 227 MATH 253 MATH 317 STAT 161 STAT 265 STAT 266 6 units in ENGL or WRS</p> <p>Notes:</p> <ul style="list-style-type: none"> • MATH 154 and MATH 156 can be substituted for MATH 117 and MATH 118, respectively. In such cases, applicants should present MATH 216. • MATH 125 can serve as a substitute for MATH 127. • MATH 225 can serve as a substitute for MATH 227. Applicants presenting MATH 225 will need to include MATH 325 in the degree. <p>Honors - Planning subject area: Admission into the Honors Planning program is permitted after completion of a minimum of 48 units of course weight. Students must complete EAS 100 and HGEO 100 (or their equivalents). Admission is contingent upon securing a research supervisor by June 15. Students planning to apply for admission should contact the Department of Earth and Atmospheric Sciences.</p> <p>Honors - Psychology subject area: Admission into the Honors Psychology program is permitted after completion of a minimum of 48 units of course weight. Students must complete PSYCH 104 and PSYCH 105 (or their equivalents). Admission is contingent upon securing a research supervisor by June 15. Students planning to apply for admission should contact the Department of Psychology.</p> <p>Honors - Neuroscience subject area: 1. A minimum 3.3 AGPA and 2. A minimum 3.3 GPA on 200 level or higher Subject Area Courses or their equivalents (if 9 units or more at the 200 level or higher in the subject area have been successfully completed).</p> <p>After Degree Applicants</p> <p>The Bachelor of Science and Bachelor of Science with Honors degrees are available as After Degrees (restricted</p>
---	---

to individuals holding one or more undergraduate degrees from recognized postsecondary institutions).

All After Degree applicants must meet the admission subject requirements as outlined in [Required Grade 12 Admission Subjects](#) to be eligible for consideration. They must provide a written letter of intent by the application deadline and present competitive grade point averages as outlined in [Minimum Grade Point Averages](#).

Notes:

1. There may be a limit on the number of After Degree students admitted each year because the Faculty of Science is under enrolment management. Admission priority will be given to students applying for their first After Degree from the Faculty of Science.
2. After Degree applicants must select their Major or Honors subject area(s) and any Minor upon application; they may not select Undeclared.
3. An After Degree may not duplicate the degree(s) previously completed. The Minor/Major/Honors subject area may not be the same as any previous Minor/Major/Honors subject area, respectively. Students may upgrade a Minor subject area to a Major or Honors subject area, or a Major subject area to an Honors subject area.
4. For additional regulations governing Science After Degrees, please see [Faculty of Science Regulations](#).

BSe General—Minor in Business

Admission of BSe General program students to the minor in Business is competitive. As described below, admission to the minor is normally by application at the end of Year 1.

Admission Requirements

1. Present an AGPA of at least 2.3 [the AGPA is calculated as defined in [Admission Grade Point Average \(AGPA\) Calculation](#) and
2. Present an average of at least 2.3 on the following courses which must have been successfully completed:
 - a. 6 units in junior ENGL or 3 units in junior ENGL and 3 units in junior WRS
 - b. ECON 101 and ECON 102
 - c. One of MATH 113, MATH 114 or MATH 117
 - d. 3 units in additional in Mathematical Sciences (Mathematics, Computing Science, or Statistics)

e. 6 units chosen from Biological Sciences, Chemistry, Earth Sciences, Physics or Science Psychology.

In ranking applicants for admission to the quota, 40% weight is given to the applicant's AGPA and 60% weight to the applicant's average on the required courses listed above. If an applicant has repeated a course, the first passing grade is used to calculate the applicant's ranking. Admission to the minor in Business is normally at the end of Year 1, and preference is given to students who apply at that point in their program. With the exception of EGON 101, applicants who do not have all the required prerequisites noted, but who have a competitive GPA are encouraged to apply. If admitted, such students will make up any course deficiencies during the first Fall/Winter in the Business Minor program.

BSc Honors and BSc Specialization Admission Requirements

Consideration for the first year of an Honors program requires a minimum application average of 80%, or 75% for Specialization, on the required five admission subjects outlined in [Required Grade 12 Admission Subjects](#) above.

Students need not apply to Honors or Specialization in the first year and may instead apply to the BSc (General) program and take 18-30 units of course weight (in each Fall/Winter) with an appropriate selection of courses. Students may then apply in any subsequent year for transfer into an Honors or Specialization program by submitting an Application for Readmission and Internal Transfer to the Office of the Registrar by the application deadline. Admission beyond first year requires the minimum competitive GPA and course load in each of the preceding Fall/Winters (refer to [Admissions Chart 7: Science Specialization and Honors Requirements](#) for specific details for each program). Delete Admissions Chart 7: Science Specialization and Honors Requirements (no longer needed)

BSe/BEd—BSe (Specialization in Science and Education) and BEd (Secondary) Combined Degree

Bachelor of Science (Specialization in Science and Education) and Bachelor of Education (Secondary) Combined Degrees

High School Applicants

High school applicants will be considered for admission based on the average on the required five admission subjects outlined in [Required Grade 12 Admission Subjects](#).

Spoken English Requirement: Applicants must also meet a Spoken English requirement (see [Spoken English Proficiency](#)).

Remove next paragraph from Admission Requirements page because this duplicates information already existing on the BSc/Ed Program Requirements page

All qualified Year 2 BSc students in this program will be promoted to Year 3 in the Faculty of Education provided that

The Faculties of Science and Education offer a combined degrees program that is more highly structured than a BSc followed by a BEd After Degree. It provides less flexibility in course choice and scheduling than taking the degrees sequentially because it is designed to meet the minimum requirements of both degrees in less time.

- [High School Applicants](#)
- [Postsecondary Transfer Applicants](#)

High School Applicants

High school applicants will be considered for admission based on the average on the required five admission subjects outlined below. See [High School Applicants](#) for minimum grade and admission average requirements. Grade 12 courses listed below are based on the Alberta Education curriculum.

Required Grade 12 Admission Subjects for Bachelor of Science and Bachelor of Education Combined Degrees:

1. English Language Arts 30-1
2. Mathematics 30-1
3. Biology 30
4. Chemistry 30
5. Subject from Group A, B, or C

Spoken English Requirement:

Applicants must also meet a Spoken English requirement (see [Spoken English Proficiency](#)).

Notes:

1. Only 5-credit courses will be used for admission purposes.
2. High school applicants should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see the [Bachelor of Science Course Pre-requisites webpage](#) for more information.
3. For information on transfer credit and credit by special assessment, see the corresponding section under [Faculty of Science Regulations](#).

1. A minimum Fall/Winter GPA of 2.3 is presented,
2. A 2.3 GPA in the declared Major is achieved and
3. A minimum of 51 units of course weight applicable to the BSc (Specialization in Science and Education)/BEd (Secondary) program has been successfully completed [see [BSc \(Specialization in Science and Education\)/BEd \(Secondary\) Combined Degrees Program \[Science\]](#)].

Postsecondary Transfer Applicants

Transfer into the BSc (Specialization in Science and Education)/BEd (Secondary) program: A student in an undergraduate program may transfer into the combined degrees program after the first year if all course and academic standing requirements of the BSc (Specialization in Science and Education)/BEd (Secondary) program and all admission requirements have been met at the time of transfer. Transfer will normally not be possible after the completion of two years (60 units of course weight). Such applicants should apply for admission to either the BEd or BSc program and on completion apply to an After Degree program in Science or Education.

A student transferring into the combined degree program with transfer credit normally will be required to complete at least 90 units of course weight (normally the last 90 units of course weight) while registered in the combined program.

Postsecondary Transfer Students

All postsecondary transfer applicants must meet the admission subject requirements as outlined in [Required Grade 12 Admission Subjects](#) to be eligible for consideration. They must be in satisfactory standing by the standards of the Faculty of Science (see [Academic Standing](#)) and present a competitive Admission-Grade Point Average (AGPA). Applicants who have been required to withdraw from the Faculty of Science at the University of Alberta and have discontinued studies as outlined in [Academic Standing](#) are also eligible for consideration.

Postsecondary Transfer Applicants

A student in an undergraduate program may transfer into this combined degrees program after the first year if all course and academic standing requirements of the Bachelor of Science (Specialization in Science and Education) and Bachelor of Education (Secondary) combined degrees program have been met at the time of transfer. Applicants must also meet the admission subject requirements as outlined in [Required Grade 12 Admission Subjects](#) and the [Spoken English Requirement](#). Transfer will normally not be possible after the completion of two years (60 units of course weight). Such applicants should apply for admission to either the Bachelor of Education or Bachelor of Science program and on completion apply to an After Degree program in Science or Education.

A student transferring into this combined degrees program with transfer credit normally will be required to complete at least 90 units of course weight (normally the last 90 units of course weight) while registered in the combined program.

For information on transfer credit and credit by special assessment, see the corresponding section under [Faculty of Science Regulations](#).

In determining the AGPA of any applicant, all attempted courses are deemed 'transferable' if they are transferable to the University of Alberta.

This paragraph is moving to Faculty Regulations page
Transfer credit will be given for university transferable coursework with a minimum grade of C- as applicable to the applicant's degree program in the Faculty of Science. If an applicant has repeated a course in which they previously obtained a passing grade at any institution, the repeated instance is not considered for transfer credit.

Applicants who have never been required to withdraw (or equivalent by the standards of the Faculty of Science) in their postsecondary education and who have successfully completed 24 units of course weight or more transferable to the University of Alberta may be considered for admission or readmission on the basis of their AGPA and any other admission requirements applicable to the program that they are seeking.

Applicants who have never been required to withdraw (or equivalent by the standards of the Faculty of Science) in their postsecondary education and who have successfully completed more than 6 units and less than 24 units of course weight transferable to the University of Alberta may be considered for admission on the basis of both their high school average on the five required courses and their postsecondary AGPA. In order to be considered, both the high school average and the postsecondary AGPA must meet the competitive averages required for the program. Applicants with 6 units or less of transferable postsecondary work may be considered for admission using only their high school average on the five required courses.

Applicants with one previous requirement to withdraw (or equivalent by the standards of the Faculty of Science) in their postsecondary education and who have chosen to requalify for admission by taking further postsecondary work may be considered for admission or readmission. Subsequent to having been required to withdraw, such applicants must present 24 units of course weight transferable to the University of Alberta with a competitive AGPA.

Applicants with one previous requirement to withdraw from the Faculty of Science who have discontinued studies for at least one year may be considered for Fall readmission to the BSc-General program on probation, subject to terms specified by the Associate Dean, Undergraduate. For students who have chosen to discontinue studies, if any coursework was attempted at

any institution during this period, the grades may be taken into consideration for readmission purposes, but transfer credit will not be granted.

Applicants who have failed Probation in the Faculty of Science or have been twice required to withdraw (or equivalent by the standards of the Faculty of Science) in their postsecondary education may seek consideration for readmission after a minimum five year period by submitting a written petition for readmission to the Associate Dean, Undergraduate. A formal application for readmission to the University of Alberta must be made by the appropriate deadline. If admission is offered, it will be on probation, subject to conditions specified by the Associate Dean, Undergraduate.

Applicants who have been required to withdraw three times (or the equivalent by the standards of the Faculty of Science) are ineligible for readmission to the Faculty of Science.

Applicants who have been expelled from any postsecondary institution are ineligible for admission to the Faculty of Science.

Moved to Faculty Regulations page Credit by special assessment: A student who has completed systematic studies equivalent to a 100- or 200-level course that would be eligible for credit in the Faculty of Science may apply for credit by special assessment. Certain IB and AP courses or completion of online courses, for instance, may qualify a student for consideration for credit by special assessment. The application process is initiated through the department offering the course. The department may require the student to write a regular final examination covering the material of the course being assessed. With the exception of students who are eligible for consideration as a result of having completed IB and AP courses [see [Applicants from International Baccalaureate \(IB\) Curriculum](#) and [Applicants from Advanced Placement \(AP\) Curriculum](#)], credit by special assessment is normally not available in laboratory courses. A fee for credit by special assessment will be levied by the Office of the Registrar except in the case of IB and AP courses. Credit by Special Assessment is not offered in courses in which a student has previously received a failing grade. See [Credit by Special Assessment](#) for further information.

Indigenous Applicants

Please refer to [Admission of Indigenous Applicants](#) for regulations and requirements.

Indigenous Applicants

Please refer to [Admission of Indigenous Applicants](#) for regulations and requirements.

Visiting Students

Students from other **universities or colleges** are eligible to be considered for admission to the Faculty of Science as visiting students if

1. They are degree program students at their home institution;
2. Their home institution provides a letter of permission;
3. They have completed a minimum of 24 units of course weight at the home institution;
4. Their academic record shows satisfactory standing.

Priority for visiting student status is given to students who are applying under the auspices of a formal exchange program. Visiting student status is granted for one academic year. Visiting students must reapply each year and present a new letter of permission from their home institution. As all admissions to the Faculty of Science are subject to enrollment management, visiting student admissions may be restricted.

Special Students

Special students are those who have been permitted to register over a one year period in one or more courses which are not being taken for credit toward a degree program. To be considered for admission as a special student, applicants must normally have received a university degree in science from an accredited postsecondary institution, must present a competitive AGPA, must meet English language proficiency requirements specified in [Language Proficiency Requirements](#) and must provide a written letter of intent to the Faculty of Science Student Services Office by the application deadline. Priority in admission is given to applicants to degree programs and to applicants who have not previously attended as special students. There may be a limit on the number of special students admitted each year because the Faculty of Science is under enrolment management. Special students may not have access to all courses offered by Science departments.

Visiting Students

Students from other **postsecondary institutions** are eligible to be considered for admission to the Faculty of Science as visiting students if:

1. They are degree program students at their home institution;
2. Their home institution provides a letter of permission;
3. They have completed a minimum of 24 units of course weight at the home institution;
4. Their academic record shows satisfactory standing.

Priority for visiting student status is given to students who are applying under the auspices of a formal exchange program. Visiting student status is granted for one academic year. Visiting students must reapply each year and present a new letter of permission from their home institution. As all admissions to the Faculty of Science are subject to enrollment management, visiting student admissions may be restricted.

Special Students

Special students are those who have been permitted to register over a one year period in one or more courses which are not being taken for credit toward a degree program. To be considered for admission as a special student, applicants must normally have received a university degree in science from an accredited postsecondary institution, must present a competitive AGPA, must meet English language proficiency requirements specified in [Language Proficiency Requirements](#) and must provide a written letter of intent to the Faculty of Science Student Services Office by the application deadline. Priority in admission is given to applicants to degree programs and to applicants who have not previously attended as special students. There may be a limit on the number of special students admitted each year because the Faculty of Science is under enrolment management. Special students may not have access to all courses offered by Science departments.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
 Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Dr. Gerda de Vries (Associate Dean, Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input checked="" type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Please add the following as a new page in the 2023-2024 calendar. These are the lists that comprise the Subject Area Courses needed to calculate one of the associated minimum grade point averages for transfer into the Bachelor or Science as described on the new "[Faculty of Science Admission Requirements](#)" page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

Proposed

Subject Area Courses for Bachelor of Science (Major and Honors)

Return to [Faculty of Science Admission Requirements](#)

Subject area courses for the Bachelor of Science are 200 level and higher courses that either explicitly satisfy the Major or Honors program requirements or potentially could satisfy the Major or Honors program requirements. Honors subject area courses include all Major subject area courses plus any additional courses as listed below.

Subject Area	Major	Honors <i>All Major subject area courses plus:</i>

Applied Mathematics	CMPUT 274 CMPUT 275 STAT 265 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • MATH • MA PH 	
Astrophysics	MATH 214 MATH 217 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • ASTRO • BIOPH • GEOPH • MA PH • PHYS 	
Biochemistry	BIOL 201 CELL 201 CHEM 261 CHEM 263 Any BIOCH courses at the 200 level or higher	CHEM 211 CHEM 213
Biological Sciences	Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • BIOCH • BIOIN • BIOL • BOT • CELL • ENT • GENET • IMIN • MA SC • MICRB • MMI • NEURO • PALEO • PHYSL • PMCOL • ZOOL 	
Cell Biology	BIOL 201 BIOL 207 CHEM 261 CHEM 263 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • BIOCH • CELL • GENET • IMIN • MICRB • NEURO • ONCOL • PHYSL 	

	<ul style="list-style-type: none"> ● PMCOL Any of the following courses at the 300 level or higher: <ul style="list-style-type: none"> ● MMI Any of the following courses at the 400 level: <ul style="list-style-type: none"> ● ANAT 	
Chemistry	Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> ● BIOCH ● CHEM 	
Computing Science	STAT 235 STAT 252 STAT 265 STAT 266 Any CMPUT courses at the 200 level or higher	
Computing Science - Software Practice	STAT 235 STAT 252 STAT 265 STAT 266 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> ● ACCTG ● BUS ● BUEC ● B LAW ● BTM ● CMPUT ● FIN ● MGTSC ● MARK ● OM ● SEM 	
Earth Sciences	Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> ● EAS ● HGEO ● PALEO ● PLAN 	
Ecology, Evolution and Environmental Biology	CHEM 261 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> ● BIOIN ● BIOL ● BOT ● ENT ● GENET ● IMIN ● MA SC ● MICRB ● PALEO ● ZOOL 	
Environmental Earth	BIOL 208	

Sciences	GEOPH 223 HGEO 250 Any EAS course at the 200 level or higher	
Geology	GEOPH 210 GEOPH 223 GEOPH 224 Any EAS course at the 200 level or higher	
Geophysics	AREC 313 AREC 365 ASTRO 429 CH E 243 CIV E 250 CIV E 381 CMPUT 267 CMPUT 466 CMPUT 481 ECE 209 MATH 214 MATH 217 MIN E 295 MIN E 323 PET E 365 STAT 235 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • EAS • GEOPH • MA PH • PHYS 	
Immunology and Infection	BIOCH 200 BIOCH 320 BIOCH 330 BIOCH 430 BIOCH 450 BIOL 201 BIOL 207 BIOL 208 BIOL 391 BIOL 409 CELL 201 CELL 300 CHEM 261 CHEM 263 ENT 378 GENET 270 GENET 304 MICRB 265 MICRB 316 PHYSL 210 PHYSL 212 PHYSL 214	BIOL 499

	<p>ZOOL 241 ZOOL 242 ZOOL 352 ZOOL 452 Any of the following courses at the 200 level or higher:</p> <ul style="list-style-type: none"> • IMIN • MMI 	
Integrative Physiology	<p>BIOCH 200 CHEM 261 ENT 220 MA SC 415 MICRB 265 MICRB 311 PMCOL 371 Any of the following courses at the 200 level or higher:</p> <ul style="list-style-type: none"> • BIOL • BOT • CELL • GENET • IMIN • NEURO • PHYSL • ZOOL 	
Mathematical Physics	<p>MATH 214 MATH 217 Any of the following courses at the 200 level or higher:</p> <ul style="list-style-type: none"> • ASTRO • BIOPH • GEOPH • MA PH • PHYS 	
Mathematics	<p>CMPUT 274 COMPUT 275 STAT 265 Any of the following courses at the 200 level or higher:</p> <ul style="list-style-type: none"> • MATH • MA PH 	
Mathematics and Economics	<p>CMPUT 274 COMPUT 275 Any of the following courses at the 200 level or higher:</p> <ul style="list-style-type: none"> • ECON • MATH • STAT 	
Mathematics and Finance	<p>CMPUT 274 COMPUT 275 ECON 281 ECON 399 STAT 265</p>	STAT 499

	STAT 266 STAT 371 STAT 378 STAT 471 Any MATH course at the 200 level or higher Any of the following courses at the 300 level or higher: <ul style="list-style-type: none"> • ACCTG • FIN • MGTSC • OM 	
Molecular, Cellular and Developmental Biology	BIOCH 200 BIOIN 301 BIOIN 401 BIOL 201 BIOL 207 BIOL 208 BIOL 221 BIOL 343 BIOL 391 BIOL 398 BIOL 399 BIOL 498 BOT 205 BOT 303 BOT 380 BOT 382 BOT 445 BOT 464 CELL 201 CHEM 261 IMIN 200 IMIN 372 IMIN 405 IMIN 410 IMIN 452 MICRB 265 MICRB 311 MICRB 315 MICRB 316 ZOOL 303 any GENET course at the 200 level or higher	BIOL 499
Neuroscience	BIOCH 200 BIOL 207 BME 510 BME 520 CHEM 261 CHEM 263 GENET 270 GENET 390 KIN 497 PHYSL 210	

	<p>PHYSL 212 PHYSL 214 PHYSL 372 PHYSL 403 PHYSL 405 PHYSL 444 PMCOL 371 PMCOL 412 PMCOL 475 PMCOL 512 PSYCH 275 PSYCH 371 PSYCH 375 PSYCH 377 PSYCH 471 PSYCH 478 PSYCI 511 ZOOL 342 ZOOL 344 any NEURO course at the 200 level or higher</p>	
Paleontology	<p>BIOL 207 BIOL 208 BIOL 221 BIOL 315 BIOL 335 BIOL 361 BIOL 364 BIOL 398 BIOL 399 BIOL 421 BIOL 498 BOT 205 BOT 308 BOT 321 CHEM 261 ENT 220 ENT 327 MA SC 410 MA SC 412 ZOOL 224 ZOOL 242 ZOOL 250 ZOOL 325 ZOOL 405 ZOOL 406 ZOOL 407 ZOOL 408 Any of the following courses at the 200 level or higher: • EAS • PALEO</p>	BIOL 499
Pharmacology	BIOCH 200	

	<p>BIOCH 320 CHEM 261 CHEM 263 PHYSL 210 PHYSL 212 PHYSL 214 Any PMCOL course at the 200 level or higher</p>	
<p>Physiology</p>	<p>ANAT 200 ANAT 305 BIOCH 200 BIOCH 320 BIOCH 330 BIOL 201 BIOL 207 BIOL 310 BIOL 330 BIOL 380 BIOL 430 BIOL 445 BME 320 BME 321 CHEM 261 CHEM 263 LABMP 400 ONCOL 320 ONCOL 425 PMCOL 200 PMCOL 303 PMCOL 305 PMCOL 371 PMCOL 412 PMCOL 415 PMCOL 416 PMCOL 475 PSYCH 351 PSYCH 354 PSYCH 356 PSYCH 367 PSYCH 372 PSYCH 375 PSYCH 377 PSYCH 381 PSYCH 403 PSYCH 413 PSYCH 471 PSYCH 473 PSYCH 478 ZOOL 342 Any of the following courses at the 200 level or higher: • CELL • PHYSL Any of the following courses at the 400 level or higher:</p>	

	<ul style="list-style-type: none"> • ANAT • BME • NEURO 	
Physics	MATH 214 MATH 217 Any of the following courses at the 200 level or higher: <ul style="list-style-type: none"> • ASTRO • BIOPH • GEOPH • MA PH • PHYS 	
Planning	BIOL 208 BIOL 299 BIOL 330 BIOL 331 BIOL 332 BIOL 333 BIOL 364 BIOL 365 BIOL 366 BIOL 381 BIOL 464 BIOL 470 EAS 221 EAS 225 EAS 250 EAS 323 EAS 324 EAS 327 EAS 351 EAS 401 EAS 425 EAS 427 EAS 428 EAS 451 EAS 452 EAS 457 EAS 458 HGEO 240 HGEO 250 HGEO 381 Any PLAN course at the 200 level or higher	HGEO 496 HGEO 497
Psychology	STAT 252 Any PSYCH course at the 200 level or higher	
Statistics	CMPUT 274 CMPUT 275 MATH 214 MATH 216 MATH 217	MATH 417

	MATH 225 MATH 227 MATH 317 Any STAT course at the 200 level or higher	
--	--	--

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty of Science: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty of Science Admission Requirements page points to Admission Chart 7: Science Specialization and Honors Requirements; however, this chart is no longer needed as we are adjusting the specific Faculty of Science admission requirements relative to the changes being proposed under the BSc Renewal Project. Namely, the BSc with Specialization degree program is being suspended and the admission requirements for the BSc with Honors degree program are being standardized. Therefore, we ask that Admission Chart 7 be deleted. We have highlighted **(in red)** the few pertinent passages that are being moved to the updated [Faculty of Science Admission Requirements](#) page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11292>

Current

~~Admissions Chart 7: Science Specialization and Honors Requirements~~

~~Postsecondary Transfer Students must meet the minimum competitive AGPA and the specific requirements for each program as outlined below.~~

~~**Note:** Students should be aware that their chosen program may contain courses for which there are specific Grade 12 prerequisites that must be met in addition to the subjects used for admission. Please see www.uofa.ualberta.ca/science/programs/undergraduate/admission-to-science for more information.~~

Program	Honors Required Average	Specialization Required Average	Admission Requirements
Applied Mathematics	High School—minimum 80% Transfer—a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors).	No Specialization program offered.	

Calendar Change Request Form for Program and Regulation Changes

Applied Mathematics—Minor in Computing Science	High School —minimum 80% Transfer —a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Applied Mathematics—Minor in Statistics	High School —minimum 80% Transfer —a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Astrophysics	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Honors in Atmospheric Sciences	Note: Effective September 2019, there will be no further admissions into BSc Specialization in Atmospheric Sciences	
Biochemistry	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.7 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Biological Sciences Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics. Note: Effective September 2017, there will be no further admissions to BSc Honors or BSc Specialization in Animal Biology, Evolutionary Biology, Microbiology and Plant Biology	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Cell Biology	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Chemistry	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA on all Chemistry courses and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Computing Science	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter and a minimum 3.0 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	

Calendar Change Request Form for Program and Regulation Changes

Computing Science– Business Minor	No Honors program offered.	High School —no Year 1 entry Transfer —Admission will be competitive and will require a minimum 2.3 GPA in each preceding Fall/Winter, a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer, and completion of <u>CMPUT 174</u> , <u>CMPUT 175</u> , <u>MATH 114</u> , <u>MATH 115</u> , 6 units in junior English, 6 units in Science, 6 units in an approved option, which may include <u>CMPUT 272</u> . For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Computing Science Specialization in Software Practice	No Honors program offered.	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter and a minimum 2.3 GPA on all CMPUT courses completed and eligible for transfer. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Computing Science Specialization Stream in Bioinformatics	Note: Effective September 2016, there will be no further admissions to BSc Honors or BSc Specialization in Bioinformatics.		
Environmental Earth Sciences	Admission to this program is subject to enrolment management and is therefore competitive. High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Course requirements: Of the required first-year courses for the program, successful completion of at least: <u>EAS 100</u> and <u>EAS 105</u> <u>CHEM 101</u> <u>MATH 113</u> or <u>MATH 114</u> <u>PHYS 124</u> or <u>PHYS 144</u>
Geology	Admission to this program is subject to enrolment management and is therefore competitive. High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.	Admission to this program is subject to enrolment management and is therefore competitive. High School —minimum 75% Transfer —a minimum cumulative average 2.3 GPA over all courses completed and completion of the course requirements outlined at right.	Course requirements: Of the required first-year courses for the program, successful completion of at least: <u>EAS 100</u> and <u>EAS 105</u> <u>CHEM 101</u> <u>MATH 113</u> or <u>MATH 114</u> <u>PHYS 124</u> or <u>PHYS 144</u>
Geophysics (Department of Physics)	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u> .	
Immunology and Infection	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	High School —minimum 75% Transfer —a minimum 2.3 GPA in each preceding Fall/Winter.	
Mathematical Physics (Department of Physics)	High School —minimum 80% Transfer —a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSc (Honors)</u> .	No Specialization program offered.	

Calendar Change Request Form for Program and Regulation Changes

Mathematics	High School —minimum 80% Transfer —a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSe (Honors)</u>	High School —minimum 75% Transfer —a minimum 2.3 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u>	
Mathematics—Minor in Computing Science	High School —minimum 80% Transfer —a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Mathematics—Minor in Statistics	High School —minimum 80% Transfer —a minimum 3.0 GPA on all Mathematics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter.	No Specialization program offered.	
Mathematics—Computational Science (Department of Mathematical and Statistical Sciences)	No Honors program offered.	High School —minimum 75% Transfer —a minimum 2.3 GPA on the aggregate of all Mathematics, Statistics and Computing Science courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u>	
Mathematics and Economics	High School —minimum 80% Transfer —a minimum 3.0 GPA on the aggregate of all Mathematics, Economics, and Statistics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see <u>BSe (Honors)</u>	High School —minimum 75% Transfer —a minimum 2.3 GPA on the aggregate of all Mathematics, Economics, and Statistics courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see <u>Bachelor of Science (Specialization)</u>	
Mathematics and Finance	High School —No Year 1 entry Transfer —Admission to this program is subject to enrolment management and is therefore competitive. For Year 2 entry —Students must have completed: 1- the preceding Fall/Winter with a minimum 3.0 GPA, and 2- Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a minimum 3.0 GPA. For Year 3 Entry —Students must have completed: 1- each preceding Fall/ Winter with a minimum 3.0 GPA, and 2- 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a minimum 3.0 GPA.	High School —No Year 1 entry Transfer —Admission to this program is subject to enrolment management and is therefore competitive. For Year 2 entry —Students must have completed: 1- the preceding Fall/Winter with a minimum 2.7 GPA, and 2- Requirements 1-5 (inclusive) for Year 2 entry (see requirements at right) with a minimum 2.7 GPA. For Year 3 Entry —Students must have completed: 1- each preceding Fall/ Winter with a minimum 2.7 GPA, and 2- 60 units of course weight applicable including the required courses for Year 3 entry (see requirements at right) with a minimum 2.7 GPA.	Specialization Mathematics and Finance Course requirements for Year 2 entry: 1- <u>MATH 151, MATH 156</u> 2- <u>MATH 125</u> 3- <u>STAT 163</u> 4- <u>ECON 101, ECON 102</u> 5- 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS Course Requirements for Year 3 entry: 1-5- Above 6- <u>MATH 214, MATH 215</u> 7- <u>MATH 225</u> 8- <u>MATH 253</u> 9- <u>STAT 265, STAT 266</u> 10- <u>ECON 281</u> Honors Mathematics and

Calendar Change Request Form for Program and Regulation Changes

			<p>Finance</p> <p>Course requirements for Year 2 entry:</p> <ol style="list-style-type: none"> 1- MATH 117, MATH 118 2- MATH 124 3- STAT 161 4- ECON 101, ECON 102 5- 6 units in junior English, OR 3 units in junior ENGL and 3 units in junior WRS <p>Notes:</p> <ol style="list-style-type: none"> 1- MATH 154 and MATH 156 can be substituted for MATH 117 and MATH 118, respectively. In such cases, applicants should present MATH 216. 2- MATH 125 can serve as a substitute for MATH 127. <p>Course Requirements for Year 3 entry:</p> <ol style="list-style-type: none"> 1-5- Above 6- MATH 217, MATH 217 7- MATH 227 8- MATH 253 9- STAT 265, STAT 266 10- ECON 281 <p>Notes:</p> <ol style="list-style-type: none"> 1- MATH 225 can serve as a substitute for MATH 227. Applicants presenting MATH 225 will need to include MATH 225 in the degree.
<p>Neuroscience (Faculty of Science and the Division of Neuroscience, Faculty of Medicine and Dentistry)</p>	<p>High School – minimum 80% Transfer – a minimum 3.3 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)</p>	<p>No Specialization program offered.</p>	
<p>Paleontology</p>	<p>Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>High School – minimum 80% Transfer – a minimum 3.0 GPA in each preceding Fall/Winter and completion of the course requirements outlined at right.</p>	<p>Admission to this program is subject to enrolment management and is therefore competitive.</p> <p>High School – minimum 75% Transfer – a minimum cumulative average 2.3 GPA over all courses completed and completion of the course requirements outlined at right.</p>	<p>Course requirements:</p> <p>Of the required first year courses for the program, successful completion of at least:</p> <p>BIOL 107 and BIOL 108</p> <p>CHEM 101 or CHEM 164</p> <p>EAS 100 and EAS 105</p> <p>MATH 113 or MATH 114, or MATH 125 or MATH 134</p>
<p>Pharmacology</p>	<p>High School – minimum 80% Transfer – a minimum 3.0 GPA on all science courses taken in each preceding Fall/Winter, a minimum 3.0 GPA in each</p>	<p>High School – minimum 75% Transfer – a minimum 2.7 GPA on all science courses taken in each preceding Fall/Winter, a minimum 2.7 GPA in each</p>	

Calendar Change Request Form for Program and Regulation Changes

	preceding Fall/Winter, and a minimum grade of B- in each Department of Pharmacology course. For admission requirements, see BSc (Honors)	preceding Fall/Winter, and a minimum 2.7 GPA in Department of Pharmacology courses for each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Physics	High School – minimum 80% Transfer – a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School – minimum 75% Transfer – a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Physiology	High School – minimum 80% Transfer – a minimum 3.0 GPA in each preceding Fall/Winter and a minimum grade of B in PHYSL 212 and PHYSL 214 or a minimum grade of A- in PHYSL 210 . For admission requirements, see BSc (Honors)	No Specialization program offered.	
Planning	No Honors program offered.	Admission to this program is subject to enrolment management and is therefore competitive. Alberta students may be given preference. High School – minimum 75% Transfer – a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Psychology (See also BA Honors for BA admission requirements)	High School – No Year 1 entry Transfer – a minimum 3.0 GPA in each preceding Fall/Winter. Admission into the Honors program is permitted after completion of a minimum of 48 units of course work. Students must complete PSYCH 105 and PSYCH 104 or SCI 100 . Acceptance is conditional on obtaining approval from a potential research supervisor. Students planning to apply for admission should consult the Departmental Honors Advisor	High School – minimum 75% Transfer – a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Bachelor of Science (Specialization)	
Statistics	High School – minimum 80% Transfer – a minimum 3.0 GPA on all Mathematics and Statistics courses taken which are eligible to be credited to the degree and a minimum 3.0 GPA in each preceding Fall/Winter. For admission requirements, see BSc (Honors)	High School – minimum 75% Transfer – a minimum 2.3 GPA on all Mathematics and Statistics courses taken which are eligible to be credited to the degree and a minimum 2.3 GPA in each preceding Fall/Winter. For admission requirements, see Faculty of Science	

Note: Each Fall/Winter GPA will be calculated on all courses completed in the Fall/Winter Session.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

The Faculty of Science Admission Deadlines table is being updated to reflect the new degree framework associated with the proposed BSc Renewal changes.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):
<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11325>

Current						Proposed					
Faculty of Science Admission Deadlines						Faculty of Science Admission Deadlines					
	Admission		Readmission		Other Requirements		Admission		Readmission		Other Requirements
	Application	Documents	Application	Documents			Application	Documents	Application	Documents	
BSc General, Specialization, Honors						BSc (Major and Honors)					
Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	For After Degree Students , letter of intent - March 1.	Fall Term	March 1	Postsecondary transfer applicant - March 15 (See Note 1) June 15 (See Note 2)	March 1	March 15 (See Note 1) June 15 (See Note 2)	For After Degree applicants , letter of intent - March 1. For Honors Planning and Honors Psycholog

					letter of intent - July 1.						letter of intent - July 1.
Winter Term	No admission or readmission					Winter Term	No admission or readmission				
Spring/Summer	No admission or readmission					Spring/Summer	No admission or readmission				

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
 Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

Information regarding the After Degree in the Faculty of Science does not belong here. Accordingly, the information will be split between the new [Faculty of Science Admission Requirements](#) page (being introduced as part of the overall BSc Renewal changes) and the [Faculty of Science Regulations](#) page.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11308>

Current

Faculty of Science General Information

Return to: [Faculty of Science](#)

- [Members of the Faculty](#)
- [Certificates](#)
- [Geophysics](#)
- [Professional Association](#)
- [Marine Science](#)
- [Northern Studies](#)
- [Professional Registration](#)
- [Science After Degrees](#)

Members of the Faculty

Listings of the members of the Faculty can be found in the

Proposed

Faculty of Science General Information

Return to: [Faculty of Science](#)

- [Members of the Faculty](#)
- [Certificates](#)
- [Geophysics](#)
- [Professional Association](#)
- [Marine Science](#)
- [Northern Studies](#)
- [Professional Registration](#)

Members of the Faculty

Listings of the members of the Faculty can be found in the

[Faculty of Science Directory.](#)

Certificates

The Faculty of Science offers certificates to graduating students which formally acknowledge that students have studied particular themes. These themes can be concentrations within a discipline, or subjects that cross interdisciplinary boundaries.

Normally the requirements for the certificates can be completed as part of the requirements for the degree; however, in some cases, a student may need to take more than the minimum required for their degree program in order to qualify for both the degree and the certificate. The following certificates are available:

- [Research Certificate in Science \(Biological Sciences\)](#)
- [Research Certificate in Science \(Psychology\)](#)

Certificate in Computer Game Development:

The Certificate in Computer Game Development is a joint certificate offered by the Faculties of Arts and Science and is open to any undergraduate student at the University of Alberta. The certificate complements discipline-specific studies with courses that provide opportunities to work in multidisciplinary teams, build complete small and medium-scale games, and interact with industry.

Details of the courses and other requirements for the certificate can be found in [Certificate in Computer Game Development](#) of the University Calendar in the Faculty of Arts Programs.

Certificate in Engaged Leadership and Citizenship in Arts and Science

Effective September 2022, there will be no further admission to this embedded certificate. Students who declared the certificate prior to September 2027 must complete all certificate requirements by April 30, 2027. The last Certificate in Engaged Leadership and Citizenship in Arts and Science will be granted at Spring Convocation 2027. Continuing students must refer to the Calendar in effect when they declared the certificate for program requirements.

The Certificate in Engaged Leadership and Citizenship in Arts and Science is a joint certificate offered by the Faculties of Arts and Science and is open to any

[Faculty of Science Directory.](#)

Certificates

The Faculty of Science offers certificates to graduating students which formally acknowledge that students have studied particular themes. These themes can be concentrations within a discipline, or subjects that cross interdisciplinary boundaries.

Normally the requirements for the certificates can be completed as part of the requirements for the degree; however, in some cases, a student may need to take more than the minimum required for their degree program in order to qualify for both the degree and the certificate. The following certificates are available:

- [Research Certificate in Science \(Biological Sciences\)](#)
- [Research Certificate in Science \(Psychology\)](#)

Certificate in Computer Game Development:

The Certificate in Computer Game Development is a joint certificate offered by the Faculties of Arts and Science and is open to any undergraduate student at the University of Alberta. The certificate complements discipline-specific studies with courses that provide opportunities to work in multidisciplinary teams, build complete small and medium-scale games, and interact with industry.

Details of the courses and other requirements for the certificate can be found in [Certificate in Computer Game Development](#) of the University Calendar in the Faculty of Arts Programs.

Certificate in Engaged Leadership and Citizenship in Arts and Science:

Effective September 2022, there will be no further admission to this embedded certificate. Students who declared the certificate prior to September 2027 must complete all certificate requirements by April 30, 2027. The last Certificate in Engaged Leadership and Citizenship in Arts and Science will be granted at Spring Convocation 2027. Continuing students must refer to the Calendar in effect when they declared the certificate for program requirements.

The Certificate in Engaged Leadership and Citizenship in Arts and Science is a joint certificate offered by the Faculties of Arts and Science and is open to any

undergraduate student at the University of Alberta.

Students wishing to pursue the Certificate in Engaged Leadership and Citizenship in Arts and Science must apply through Undergraduate Student Services in the Faculty of Arts or through Undergraduate Student Services in the Faculty of Science by the application deadline for convocation (see [Academic Schedule](#)).

Details of the courses and other requirements for the certificate can be found in [Certificate in Engaged Leadership and Citizenship in Arts and Science \[Arts\]](#) of the University Calendar in the Faculty of Arts Programs.

Geophysics

The Department of Physics offers two programs dealing with solid earth physics. The Honors in Geophysics program (see [Honors in Geophysics](#)) prepares students for graduate work in geophysics. The [Specialization in Geophysics](#) program prepares students with the conceptual and laboratory background required for employment at the BSc level in industry, government and technical schools. Also see [Physics Honors Programs](#) and [Physics Specialization Programs](#) (Physics).

Professional Association

The practice of geophysics in Alberta is regulated by the Association of Professional Engineers and Geoscientists of Alberta (APEGA).

The right to practise geophysics in Alberta and accept professional responsibility for such work as well as the right to use the geophysicist title is limited to those registered with APEGA.

Members of the Geophysics Student Society are automatically student members of APEGA. Graduates are encouraged to join APEGA as Geophysicists-in-training. Acceptable experience following graduation is necessary for registration as a Professional Geophysicist, the APEGA membership category which confers the right to accept responsibility for geophysical work. Contact the APEGA office for more information.

Marine Science

Excellent opportunities for the study of marine biology and related subjects exist at Bamfield Marine Sciences Centre (BMSC) on Vancouver Island, BC. An academic program operates at the station, with summer and fall programs

undergraduate student at the University of Alberta.

Students wishing to pursue the Certificate in Engaged Leadership and Citizenship in Arts and Science must apply through Undergraduate Student Services in the Faculty of Arts or through Undergraduate Student Services in the Faculty of Science by the application deadline for convocation (see [Academic Schedule](#)).

Details of the courses and other requirements for the certificate can be found in [Certificate in Engaged Leadership and Citizenship in Arts and Science \[Arts\]](#) of the University Calendar in the Faculty of Arts Programs.

Geophysics

The Department of Physics offers two programs dealing with solid earth physics. The Honors in Geophysics program (see [Honors in Geophysics](#)) prepares students for graduate work in geophysics. The [Specialization in Geophysics](#) program prepares students with the conceptual and laboratory background required for employment at the BSc level in industry, government and technical schools. Also see [Physics Honors Programs](#) and [Physics Specialization Programs](#) (Physics).

Professional Association

The practice of geophysics in Alberta is regulated by the Association of Professional Engineers and Geoscientists of Alberta (APEGA).

The right to practise geophysics in Alberta and accept professional responsibility for such work as well as the right to use the geophysicist title is limited to those registered with APEGA.

Members of the Geophysics Student Society are automatically student members of APEGA. Graduates are encouraged to join APEGA as Geophysicists-in-training. Acceptable experience following graduation is necessary for registration as a Professional Geophysicist, the APEGA membership category which confers the right to accept responsibility for geophysical work. Contact the APEGA office for more information.

Marine Science

Excellent opportunities for the study of marine biology and related subjects exist at Bamfield Marine Sciences Centre (BMSC) on Vancouver Island, BC. An academic program operates at the station, with summer and fall programs

providing credit toward degrees in Science.

Prerequisite for all the MA SC courses is consent of the Department of Biological Sciences.

Students are expected to take a full course load of 15 units of course weight during the Fall Term. Courses run Monday to Saturday.

In addition to tuition paid to the University there are room and board fees payable to BMSC. Information concerning course prerequisites and application procedures for Marine Science may be obtained from BMSC, the Department of Biological Sciences or the Office of the Dean of Science. Permission to register in these courses is available from the University Programs Coordinator of the Bamfield Marine Sciences Centre, to whom application should be made. See BMSC website www.bamfieldmsc.com.

See [Course Listings](#) for descriptions of available Marine Science courses.

See also BMSC website www.bamfieldmsc.com for courses offered in the current year.

Northern Studies

Students interested in Canada's North and especially those planning a career in northern Canada should include within their curriculum some of the following: ANTHR 246, 340, 355, 445, and 446; [BIOL 366](#); CANST 302 and 408; EAS 453 and 455; ENCS 201; INT D 443; POL S 432. These courses may be taken within the framework of existing General, Specialization, or Honors programs in the Faculty of Science. Students interested in Northern Studies should mention this to their faculty advisor.

Professional Registration

Graduates of EAS programs may qualify for registration as professional geologists (P. Geol.). The practice of geology in Alberta is governed by provincial law in the interest of public protection against unskilled practice. The right to practice independently (meaning that you are legally able to accept responsibility for your work and sign for it), and the right to use the title of professional geologist (P. Geol.), are restricted to individuals registered by the Association of Professional Engineers and Geoscientists of Alberta (APEGA). Members of the PS Warren student society are automatically student members of APEGA and as such are introduced to the professional association.

Individuals who are planning to meet the knowledge requirements for P. Geol. while also completing their

providing credit toward degrees in Science.

Prerequisite for all the MA SC courses is consent of the Department of Biological Sciences.

Students are expected to take a full course load of 15 units of course weight during the Fall Term. Courses run Monday to Saturday.

In addition to tuition paid to the University there are room and board fees payable to BMSC. Information concerning course prerequisites and application procedures for Marine Science may be obtained from BMSC, the Department of Biological Sciences or the Office of the Dean of Science. Permission to register in these courses is available from the University Programs Coordinator of the Bamfield Marine Sciences Centre, to whom application should be made. See BMSC website www.bamfieldmsc.com.

See [Course Listings](#) for descriptions of available Marine Science courses.

See also BMSC website www.bamfieldmsc.com for courses offered in the current year.

Northern Studies

Students interested in Canada's North and especially those planning a career in northern Canada should include within their curriculum some of the following: ANTHR 246, 340, 355, 445, and 446; [BIOL 366](#); CANST 302 and 408; EAS 453 and 455; ENCS 201; INT D 443; POL S 432. These courses may be taken within the framework of existing General, Specialization, or Honors programs in the Faculty of Science. Students interested in Northern Studies should mention this to their faculty advisor.

Professional Registration

Graduates of EAS programs may qualify for registration as professional geologists (P. Geol.). The practice of geology in Alberta is governed by provincial law in the interest of public protection against unskilled practice. The right to practice independently (meaning that you are legally able to accept responsibility for your work and sign for it), and the right to use the title of professional geologist (P. Geol.), are restricted to individuals registered by the Association of Professional Engineers and Geoscientists of Alberta (APEGA). Members of the PS Warren student society are automatically student members of APEGA and as such are introduced to the professional association.

Individuals who are planning to meet the knowledge requirements for P. Geol. while also completing their

degree at the University of Alberta should plan their program course selection carefully. Attention is drawn in particular to the science subject requirements, additional to calculus, physics and chemistry. APEGA verifies that specific knowledge requirements are met, by reviewing academic credentials course-by-course. Holders of degrees that do not cover the APEGA syllabus may be assessed examinations in missing subjects by the APEGA Board of Examiners before being accepted for registration. Current syllabus and registration information is available at the Departmental Office or from APEGA. Full information is available at www.apega.ca

Specific questions about programs of study or individual courses applicable to professional registration can also be directed to the Departmental APEGA Liaison.

Science After Degrees

An individual holding one or more undergraduate degrees from recognized postsecondary institutions may earn an additional undergraduate degree (After Degree) from the Faculty of Science. The After Degree may be a [Bachelor of Science General](#), a [Bachelor of Science Specialization](#) or a [Bachelor of Science Honors](#). The BSc Specialization in Science and Education degree is not available as an After Degree. There may be a limit on the number of After Degree students admitted each year because the Faculty of Science is under enrolment management. Admission priority will be given to students applying for their first after degree from the Faculty of Science.

Note: For success in your chosen program, ensure you have satisfied the pre/corequisite requirements for all courses. Departments have the right to remove students from courses for failing to present a passing grade (or higher, where stipulated) in the prerequisite course(s) and/or for failing to be enrolled in the corequisite course(s). Please see www.uofa.ualberta.ca/science/programs/undergraduate/admission-to-science for more information.

1. All of the admission, program, academic standing and graduation standards that apply to a regular degree also apply to After Degree programs, except as noted in [Graduation Year](#). Admission to a BSc Specialization or BSc Honors After Degree program requires the approval of the appropriate Department and the Faculty office. Please refer to [Faculty of Science Admission Requirements](#) for program admission requirements in the Faculty of Science.
2. An After Degree may not duplicate the degree(s) previously completed. The major or minor of a BSc

degree at the University of Alberta should plan their program course selection carefully. Attention is drawn in particular to the science subject requirements, additional to calculus, physics and chemistry. APEGA verifies that specific knowledge requirements are met, by reviewing academic credentials course-by-course. Holders of degrees that do not cover the APEGA syllabus may be assessed examinations in missing subjects by the APEGA Board of Examiners before being accepted for registration. Current syllabus and registration information is available at the Departmental Office or from APEGA. Full information is available at www.apega.ca

Specific questions about programs of study or individual courses applicable to professional registration can also be directed to the Departmental APEGA Liaison.

General After Degree may not be the same as the major or minor of the previous degree(s). The only exception is that students who wish to upgrade a previous Science minor to be the major in the After Degree may do so provided their new minor does not overlap with either the major or minor of the previous degree(s). In the case of BSc Specialization and BSc Honors programs, the area of concentration may not be the same as that of the previous degree(s). However, qualified students holding a BSc General degree from this institution or its equivalent from another institution may use the After Degree to upgrade their previous major to a BSc Specialization or BSc Honors program.

3. If applying to a BSc General After Degree program, a major and a minor must be declared upon application.

4. All students in After Degree programs must follow the program to which they have been admitted and must demonstrate progress towards completion of the degree in each Fall/Winter (see [Graduation Year](#)).

5. To complete an After Degree, a minimum 30 units of course weight will be required if the student holds a BSc degree from the Faculty of Science at the University of Alberta, and a minimum of 60 units of course weight will be required if the student holds an undergraduate degree from another Faculty or University. The actual number of credits required to complete an After Degree is dependent on the coursework that was completed prior to the After Degree program and will be determined at the time of admission.

6. In a BSc General After Degree program, students with a previous BSc General degree from the Faculty of Science at the University of Alberta must complete a minimum of 9 senior units of course weight in their major and a minimum of 6 senior units of course weight in their minor while registered in the After Degree program. Students holding a degree from outside the Faculty of Science at the University of Alberta must complete a minimum of 18 senior units of course weight in their major and a minimum of 12 senior units of course weight in their minor while registered in the After Degree program.

7. In a BSc Specialization or BSc Honors After Degree program, students with a previous undergraduate degree from the Faculty of Science at the University of Alberta must complete a minimum of 15 senior units of course weight in the area of concentration of the new degree while registered in the After Degree program. Students holding a degree from outside the Faculty of Science at the University of Alberta must complete a minimum of 24 units of course weight in the area of concentration of the new degree while registered in the After Degree program.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.

Calendar Change Request Form for Program and Regulation Changes

See the [Calendar Guide](#) for tips on how to complete this form.

Faculty (& Department or Academic Unit):	Faculty of Science	
Contact Person:	Gerda de Vries, Associate Dean (Undergraduate)	
Level of change (choose one only)	<input checked="" type="checkbox"/>	Undergraduate
	<input type="checkbox"/>	Graduate
Type of change request (check all that apply)	<input type="checkbox"/>	Program
	<input checked="" type="checkbox"/>	Regulation
For which term is this intended to take effect?	Fall 2023	
Does this proposal have corresponding course changes? (Should be submitted at the same time)	No	

Rationale

This document presents three key changes to the Faculty of Science Regulations page. These changes stem from other changes being made relative to the BSc Renewal Project.

1. Transfer Credit and Credit by Special Assessment

Sections regarding Transfer Credit and Credit by Special Assessment were previously found on the Faculty of Science Admission Requirements page. These sections are regulatory in nature and apply across the Faculty to all BSc programs, and therefore moved here.

2. Internal Changes to Program and/or Subject Area

This is a new regulations section being proposed in conjunction with the BSc Renewal Project (so it is provided here for information purposes for the 2023-24 academic year, but won't actually come into effect until Fall 2024). These regulations will pertain to students currently registered in the Faculty of Science who are looking to change from a Major program to an Honors program (or vice versa), declare or change their Major/Honors subject area, or declare, change or undeclare their Minor subject area.

3. Science After Degrees

Information regarding the After Degree in the Faculty of Science was previously found on the General Information page (which was not the correct place for it). The text in the original section has been split between the [Faculty of Science Admission Requirements](#) page and this page. That is, the text associated with admissions has been moved to the Admission Requirements page and the text associated with regulations has been moved here.

Calendar Copy

URL in current Calendar (or leave blank if it is a new page):

<https://calendar.ualberta.ca/content.php?catoid=36&navoid=11200>

<p>Current</p> <p>Faculty of Science Regulations</p> <p>Return to: Faculty of Science</p> <ul style="list-style-type: none"> • Faculty Overview • Degrees • Admission • Definitions • Academic Standing • Courses • Graduation • Appeals and Grievances • Visiting Student Status • Study Abroad • Science Internship Program <p>Faculty Overview</p> <p>The Faculty of Science offers degrees in Applied Mathematics, Astrophysics, Biochemistry, Biological Sciences (Ecology, Evolution and Environmental Biology; Integrative Physiology; and Molecular, Cellular and Developmental Biology), Chemistry, Cell Biology, Computing Science, Computing Science with Business Minor, Environmental Earth Sciences, Geology, Geophysics, Immunology and Infection, Mathematical Physics, Mathematics, Mathematics (Computational Science) Mathematics and Economics, Mathematics and Finance, Neuroscience, Paleontology, Pharmacology, Physics, Physiology, Psychology, and Statistics.</p> <p>A Business Minor, an Arts Minor and an Agricultural, Life and Environmental Sciences minor are available in the BSc General program.</p> <p>A Science Internship Program (SIP) is available to Faculty of Science BSc students to enhance their studies and provide relevant work experience. Students must complete an 8-, 12- or 16- month work experience term at the end of their third year to receive SIP designation on their degree parchment. For more details, please see Science Internship Program.</p> <p>Degrees</p> <p>The Faculty offers three programs leading to the Bachelor of Science (BSc) degree: Honors, Specialization, and General.</p> <p>The Faculty also offers a Bachelor of Science with Specialization in Science Education which is part of a five year BSc/BEd combined degrees program.</p>	<p>Proposed</p> <p>Faculty of Science Regulations</p> <p>Return to: Faculty of Science</p> <ul style="list-style-type: none"> • Faculty Overview • Degrees • Admission • Transfer Credit • Credit by Special Assessment • Definitions • Academic Standing • Courses • Internal Changes to Program and/or Subject Area • Graduation • Appeals and Grievances • Visiting Student Status • Study Abroad • Science Internship Program • Science After Degrees <p>Faculty Overview</p> <p>The Faculty of Science offers degrees in Applied Mathematics, Astrophysics, Biochemistry, Biological Sciences (Ecology, Evolution and Environmental Biology; Integrative Physiology; and Molecular, Cellular and Developmental Biology), Chemistry, Cell Biology, Computing Science, Computing Science with Business Minor, Environmental Earth Sciences, Geology, Geophysics, Immunology and Infection, Mathematical Physics, Mathematics, Mathematics (Computational Science) Mathematics and Economics, Mathematics and Finance, Neuroscience, Paleontology, Pharmacology, Physics, Physiology, Psychology, and Statistics.</p> <p>A Business Minor, an Arts Minor, a Native Studies Minor, and an Agricultural, Life and Environmental Sciences minor are available in the BSc General program.</p> <p>A Science Internship Program (SIP) is available to Faculty of Science BSc students to enhance their studies and provide relevant work experience. Students must complete an 8-, 12- or 16- month work experience term at the end of their third year to receive SIP designation on their degree parchment. For more details, please see Science Internship Program.</p> <p>Degrees</p> <p>The Faculty offers three programs leading to the Bachelor of Science (BSc) degree: Honors, Specialization, and General.</p> <p>The Faculty also offers a Bachelor of Science with Specialization in Science Education which is part of a five year BSc/BEd combined degrees program.</p>
--	---

The four-year Honors programs are primarily for students who seek careers in scientific research. In addition, they prepare students for admission to graduate school, leading to a Master of Science (MSc) or a Doctor of Philosophy (PhD) degree.

The four-year Specialization programs do not concentrate on one subject to the same extent as the Honors programs. This allows students to choose from a broader range of courses and to take a greater number of courses in a secondary area of interest. They can provide the background necessary for admission to graduate schools, in some cases, and permit attainment of professional status in others.

The four-year General program provides a general education with a scientific emphasis for students who seek careers in business, teaching, medicine, dentistry, etc.

In many cases, transfer from one degree program to another can be easily arranged to suit students' changing ambitions, needs, or academic qualifications.

Regulations governing the Honors, Specialization, and General degree programs are found in [Programs](#), followed by descriptions of each degree program under the subject headings.

Admission

General admission requirements for the University are set out in [Programs of Study](#) and [General Undergraduate Admission Requirements](#). Specific admission information for the Faculty of Science is detailed in [Faculty of Science Admission Requirements](#).

The four-year Honors programs are primarily for students who seek careers in scientific research. In addition, they prepare students for admission to graduate school, leading to a Master of Science (MSc) or a Doctor of Philosophy (PhD) degree.

The four-year Specialization programs do not concentrate on one subject to the same extent as the Honors programs. This allows students to choose from a broader range of courses and to take a greater number of courses in a secondary area of interest. They can provide the background necessary for admission to graduate schools, in some cases, and permit attainment of professional status in others.

The four-year General program provides a general education with a scientific emphasis for students who seek careers in business, teaching, medicine, dentistry, etc.

In many cases, transfer from one degree program to another can be easily arranged to suit students' changing ambitions, needs, or academic qualifications.

Regulations governing the Honors, Specialization, and General degree programs are found in [Programs](#), followed by descriptions of each degree program under the subject headings.

Admission

General admission requirements for the University are set out in [Programs of Study](#) and [General Undergraduate Admission Requirements](#). Specific admission information for the Faculty of Science is detailed in [Faculty of Science Admission Requirements](#).

Note: The Bachelor of Science degree framework has undergone a major renewal. Starting Fall 2024 students will choose from two pathways, BSc (Major) versus BSc (Honors). Admission to the General and Specialization programs will be suspended effective Fall 2024. Please see [Faculty of Science Admission Requirements](#) for information regarding admission into the new Bachelor of Science degree program.

Transfer Credit

In determining the AGPA of any applicant, all attempted courses are deemed 'transferable' if they are transferable to the University of Alberta.

Transfer credit will be given for university transferable coursework with a minimum grade of C- as applicable to the applicant's degree program in the Faculty of Science. If an applicant has repeated a course in which they previously obtained a passing grade at any institution, the repeated instance is not considered for transfer credit.

Credit by Special Assessment

A student who has completed systematic studies equivalent to a 100- or 200-level course that would be eligible for credit in the Faculty of Science may apply for credit by special assessment. Certain IB and AP courses or completion of online courses, for instance, may qualify a student for consideration for credit by special assessment. The application process is initiated through the department offering the course. The department may require the student to write a regular final examination covering the material of the course being assessed. With the exception of students who are eligible for consideration as a result of having completed IB and AP courses [see [Applicants from International Baccalaureate \(IB\) Curriculum](#) and [Applicants from Advanced Placement \(AP\) Curriculum](#)], credit by special assessment is normally not available in laboratory courses. A fee for credit by special assessment will be levied by the Office of the Registrar except in the case of IB and AP courses. Credit by Special Assessment is not offered in courses in which a student has previously received a failing grade. See [Credit by Special Assessment](#) for further information.

Definitions

The following terms, definitions, and abbreviations are used throughout this section of the Calendar. Also see the Calendar's [Glossary](#).

1. **Approved Option**

In the Faculty of Science section, the term "approved option" appears only within the description of Honors and Specialization programs. For students registered in an Honors or Specialization BSc program, an "approved option" is a course (from Arts, Science, or another Faculty) approved in writing by the department directing the student's program.

General program students interested in taking courses from Faculties other than Arts or Science should see [Selection of Courses](#).

Definitions

The following terms, definitions, and abbreviations are used throughout this section of the Calendar. Also see the Calendar's [Glossary](#).

1. **Approved Option**

In the Faculty of Science section, the term "approved option" appears only within the description of Honors and Specialization programs. For students registered in an Honors or Specialization BSc program, an "approved option" is a course (from Arts, Science, or another Faculty) approved in writing by the department directing the student's program.

General program students interested in taking courses from Faculties other than Arts or Science should see [Selection of Courses](#).

<p>2. Arts Option Those courses offered by the Faculty of Arts for which the student is eligible, Christian Theology courses and Native Studies courses listed in Course Listings. Note: Students registered in the Faculty of Science may not take SOC 210, SOC 315 for degree credit.</p> <p>3. Courses Attempted Refers to university or university transfer courses completed with a final grade and excludes courses from which a student has withdrawn with permission.</p> <p>4. Courses Successfully Completed Refers to university courses with a final grade of D or higher.</p> <p>5. Course Weight A unit of course weight indicates the instructional credit assigned to a course. Units of course weight form a part of the degree requirements and are also used to calculate a student's Grade Point Average (GPA).</p> <p>6. Fall/Winter The instructional period of September to April.</p> <p>7. Two-term Course A two-term course is a single course worth 6 units of course weight.</p> <p>8. Term The instructional periods from September to December (Fall) and January to April (Winter). In Spring/Summer, the instructional periods of May/June (Spring) and July/August (Summer).</p> <p>9. Single-term Course A single-term course is a single course worth 3 units of course weight.</p> <p>10. Junior Courses Those courses numbered 199 or lower.</p> <p>11. Normal Course Load A normal, full academic course load is 30 units of course weight during Fall/Winter.</p> <p>12. Option The term "option" where it appears in programs means a course chosen by the student from offerings by the Faculties of Arts or Science if the necessary prerequisites have been met.</p> <p>13. Outside Option Those courses offered by Faculties not including the Faculty of Science or the Faculty of Arts.</p> <p>14. Science Option Those courses offered by the Faculty of Science for which the student is eligible. Note: Not all courses offered by the Faculty of Science are available to students registered in the Faculty of Science.</p> <p>15. Spring/Summer</p>	<p>2. Arts Option Those courses offered by the Faculty of Arts for which the student is eligible, Christian Theology courses and Native Studies courses listed in Course Listings. Note: Students registered in the Faculty of Science may not take SOC 210, SOC 315 for degree credit.</p> <p>3. Courses Attempted Refers to university or university transfer courses completed with a final grade and excludes courses from which a student has withdrawn with permission.</p> <p>4. Courses Successfully Completed Refers to university courses with a final grade of D or higher.</p> <p>5. Course Weight A unit of course weight indicates the instructional credit assigned to a course. Units of course weight form a part of the degree requirements and are also used to calculate a student's Grade Point Average (GPA).</p> <p>6. Fall/Winter The instructional period of September to April.</p> <p>7. Two-term Course A two-term course is a single course worth 6 units of course weight.</p> <p>8. Term The instructional periods from September to December (Fall) and January to April (Winter). In Spring/Summer, the instructional periods of May/June (Spring) and July/August (Summer).</p> <p>9. Single-term Course A single-term course is a single course worth 3 units of course weight.</p> <p>10. Junior Courses Those courses numbered 199 or lower.</p> <p>11. Normal Course Load A normal, full academic course load is 30 units of course weight during Fall/Winter.</p> <p>12. Option The term "option" where it appears in programs means a course chosen by the student from offerings by the Faculties of Arts or Science if the necessary prerequisites have been met.</p> <p>13. Outside Option Those courses offered by Faculties not including the Faculty of Science or the Faculty of Arts.</p> <p>14. Science Option Those courses offered by the Faculty of Science for which the student is eligible. Note: Not all courses offered by the Faculty of Science are available to students registered in the Faculty of Science.</p> <p>15. Spring/Summer</p>
---	---

The instructional periods of May/June (Spring Term) and July/August (Summer Term).

16. Year of Program

Year of program, as referred to throughout the Science section, is defined below. Students who are applying to, or continuing in, the Faculty of Science are considered to be in

- a. Year 1 if they have successfully completed up to 29 units of course weight of their degree program;
- b. Year 2 if they have successfully completed between 30 and 59 units of course weight of their degree program;
- c. Year 3 if they have successfully completed between 60 and 89 units of course weight of their degree program;
- d. Year 4 if they have successfully completed at least 90 units of course weight of their degree program.

-
-
-

Courses

1. Selection of Courses

Students are responsible for familiarizing themselves with program requirements and limitations as specified in the Calendar, for ensuring their programs are properly planned in accordance with degree specifications, and for the completeness and accuracy of their registration. Please read the Calendar carefully before registering in courses, and if you are in doubt about any regulations pertaining to your program, consult the Faculty of Science Office (1-001 CCIS) for clarification.

Students registered in the Faculty of Science must complete Science courses and Arts courses as specified by their program. Students may also take courses from other Faculties, but must adhere to the program-imposed limits for such Outside options.

Note: Anatomy courses are offered by the Faculty of Medicine and Dentistry and are considered Outside options.

2. Selection of First-Year Courses

Beginning first-year students who have completed no credits toward their programs normally restrict their registration to junior courses. First year students contemplating taking senior level courses should be

The instructional periods of May/June (Spring Term) and July/August (Summer Term).

16. Year of Program

Year of program, as referred to throughout the Science section, is defined below. Students who are applying to, or continuing in, the Faculty of Science are considered to be in

- a. Year 1 if they have successfully completed up to 29 units of course weight of their degree program;
- b. Year 2 if they have successfully completed between 30 and 59 units of course weight of their degree program;
- c. Year 3 if they have successfully completed between 60 and 89 units of course weight of their degree program;
- d. Year 4 if they have successfully completed at least 90 units of course weight of their degree program.

-
-
-

Courses

1. Selection of Courses

Students are responsible for familiarizing themselves with program requirements and limitations as specified in the Calendar, for ensuring their programs are properly planned in accordance with degree specifications, and for the completeness and accuracy of their registration. Please read the Calendar carefully before registering in courses, and if you are in doubt about any regulations pertaining to your program, consult the Faculty of Science Office (1-001 CCIS) for clarification.

Students registered in the Faculty of Science must complete Science courses and Arts courses as specified by their program. Students may also take courses from other Faculties, but must adhere to the program-imposed limits for such Outside options.

Note: Anatomy courses are offered by the Faculty of Medicine and Dentistry and are considered Outside options.

2. Selection of First-Year Courses

Beginning first-year students who have completed no credits toward their programs normally restrict their registration to junior courses. First year students contemplating taking senior level courses should be

<p>careful to ensure that they have completed any prerequisites.</p> <p>3. Withdrawal from Courses Courses from which the student withdraws up to and including the last day for registration in the Fall and Winter Terms will not appear on the student’s record. Courses from which the student withdraws after the last day of registration and up to the withdrawal deadline will appear with a grade of “W” (Withdrew with permission) on the transcript. Deadlines for withdrawing from courses are listed in Academic Schedule.</p> <p>4. Prerequisites Courses with prerequisites may only be used for degree credit if the prerequisite requirements are met. A grade of D is the minimum grade acceptable in a course which is to be used as a prerequisite. Where a prerequisite is stated, it is understood that equivalent courses may be used to satisfy the requirement. In addition, the department offering a course with prerequisite requirements may waive the prerequisite in writing. (Prerequisite waiver forms are available from the Faculty of Science office and the Department offices). Students who are unsure if they meet the prerequisite requirements in a course, or who wish to obtain permission to have a prerequisite waived, should consult the department offering the course.</p> <p>5. Repeating Courses No student will be permitted to repeat any University course, whether a failed course or a course having a grade of W, more than once except for reasons deemed sufficient by the Council of the Faculty in which the student is enrolled. For Science students, the Faculty will withhold credit or indicate the course is extra to degree on any course that contravenes this regulation. Normally, a student will not be permitted to repeat a course in which a grade of D or more has been received. Only two exceptions are permitted, and each requires written approval of the Dean or designee:</p> <ol style="list-style-type: none"> When a higher grade is necessary for a course that is required in the student’s current degree program. When a student in Satisfactory Standing in the last year of a degree program repeats one course to raise the GPA to the level required by the degree program <p>A student who repeats a course in which a grade of D or more has been received, without written permission of the Faculty of Science, will have the grade attained on the initial passing of the course used for the purpose of meeting degree</p>	<p>careful to ensure that they have completed any prerequisites.</p> <p>3. Withdrawal from Courses Courses from which the student withdraws up to and including the last day for registration in the Fall and Winter Terms will not appear on the student’s record. Courses from which the student withdraws after the last day of registration and up to the withdrawal deadline will appear with a grade of “W” (Withdrew with permission) on the transcript. Deadlines for withdrawing from courses are listed in Academic Schedule.</p> <p>4. Prerequisites Courses with prerequisites may only be used for degree credit if the prerequisite requirements are met. A grade of D is the minimum grade acceptable in a course which is to be used as a prerequisite. Where a prerequisite is stated, it is understood that equivalent courses may be used to satisfy the requirement. In addition, the department offering a course with prerequisite requirements may waive the prerequisite in writing. (Prerequisite waiver forms are available from the Faculty of Science office and the Department offices). Students who are unsure if they meet the prerequisite requirements in a course, or who wish to obtain permission to have a prerequisite waived, should consult the department offering the course.</p> <p>5. Repeating Courses No student will be permitted to repeat any University course, whether a failed course or a course having a grade of W, more than once except for reasons deemed sufficient by the Council of the Faculty in which the student is enrolled. For Science students, the Faculty will withhold credit or indicate the course is extra to degree on any course that contravenes this regulation. Normally, a student will not be permitted to repeat a course in which a grade of D or more has been received. Only two exceptions are permitted, and each requires written approval of the Dean or designee:</p> <ol style="list-style-type: none"> When a higher grade is necessary for a course that is required in the student’s current degree program. When a student in Satisfactory Standing in the last year of a degree program repeats one course to raise the GPA to the level required by the degree program <p>A student who repeats a course in which a grade of D or more has been received, without written permission of the Faculty of Science, will have the grade attained on the initial passing of the course used for the purpose of meeting degree</p>
---	---

requirements, and no credit will be assigned to the repeated course.

6. Course Load Limits

Students are limited to 15 units per Fall/Winter and 6 units per Spring/Summer. When a student wishes to go beyond these limits, written approval is required from the Faculty of Science. Approval will not be granted to first-year students. Approval for other students is contingent on having obtained a GPA of at least 3.0 on a course load of 30 units in the previous F/W at the University of Alberta.

requirements, and no credit will be assigned to the repeated course.

6. Course Load Limits

Students are limited to 15 units per Fall/Winter and 6 units per Spring/Summer. When a student wishes to go beyond these limits, written approval is required from the Faculty of Science. Approval will not be granted to first-year students. Approval for other students is contingent on having obtained a GPA of at least 3.0 on a course load of 30 units in the previous F/W at the University of Alberta.

Internal Changes to Program and/or Subject Area

Note: This section pertains only to the new Bachelor of Science degree programs coming into effect Fall 2024. To preview the new program requirements, please see [Bachelor of Science \(Major and Honors\) - Effective Fall 2024](#).

This section applies to students currently registered in the Faculty of Science. Students not currently registered in the Faculty of Science should see [Faculty of Science Admission Requirements](#).

Declaration of and changes to a student's Major, Honors and/or Minor subject area are considered once a year. Students must submit a Statement of Major/Honors/Minor Form via [SciForms](#) by March 1. If approved, the change in program/subject area will come into effect the Fall term of the same calendar year.

Declaring/Changing Major/Honors Subject Area

Students whose Major/Honors subject area is Undeclared must declare their Major/Honors subject area prior to accumulating 60 units towards their program. However, it is to a student's advantage to declare their subject area as soon as possible.

Changing a Major subject area or an Honors subject area, or changing from a Major subject area to an Honors subject area (or vice versa), is not normally permitted once 90 units have been accumulated toward the degree program.

See [Minimum Grade Point Averages and Additional Criteria](#) for eligibility.

Notes:

1. Certain Major/Honors subject areas are under enrolment management and therefore are competitive. Presentation of the minimum GPA does not guarantee acceptance into these subject areas.
2. Acceptance to the Honors Planning or Honors Psychology subject area is contingent upon securing a research supervisor by June 15. Students planning to declare or change to the Honors Planning or Honors Psychology subject area should contact the respective department.

Declaring/Changing/Undeclaring Minor Subject Area

Students choosing to complete a Minor are not normally permitted to declare or change their Minor subject area after having accumulated 90 units towards their program. Students may undeclare their Minor prior to graduation.

a. Minor in Business

The Minor in Business requires at least one year of study and is competitive. To be considered for the Minor in Business, students must present:

- An AGPA of at least 2.3 and
- An average of at least 2.3 on the following courses, which must have been successfully completed:
 - 6 units in junior ENGL or 3 units in junior ENGL and 3 units in junior WRS
 - ECON 101 and ECON 102
 - One of MATH 117, MATH 134, MATH 144 or MATH 154
 - 3 units in additional Mathematical Sciences (Mathematics, Computing Science, or Statistics)
 - 6 units chosen from Biological Sciences, Chemistry, Earth and Atmospheric Sciences, Physics or Science Psychology.

In ranking students to meet the quota, 40% weight is given to the student's AGPA and 60% weight to the student's average on the required courses listed above. If a student has repeated a course, the first passing grade is used to calculate the student's ranking. This ranking is normally completed at the end of Year 1, and preference is given to students who request the Minor in Business at that point in their program. With the exception of ECON 101, students who do not have all the required prerequisites noted, but who have a competitive GPA, may make up any course deficiencies during the first Fall/Winter after being allowed into the Minor in Business.

Graduation

1. Application for Graduation

Students must be in satisfactory standing in their program (i.e., meet the continuation requirements in their final Fall/Winter) in order to graduate. Students who intend to receive a BSc (General, Specialization, or Honors) Degree must apply for the Degree on [Bear Tracks](#) by February 1 for Spring Convocation or by September 1 for Fall Convocation. If degree requirements have been met and the student has not applied to graduate, the Faculty may apply on their behalf. All official transcripts from other postsecondary institutions are due by May 1 for Spring Convocation or by October 1 for Fall Convocation. Students who intend to apply for admission to an alternate degree program in the Faculty of Science for convocation purposes only must meet all of the admission, continuation, residency and graduation criteria for that BSc program.

2. Degree Requirements

All BSc Degrees require a minimum of 120 units of course weight. Courses with weights of 0 units are offered for credit only, and, although they may be required in specific degree programs, cannot be used to meet the minimum units of course weight requirement in any degree program.

3. Convocation

All requirements for graduation at Spring Convocation must be met by the end of Fall/Winter. Those completing degree requirements during Spring/Summer will graduate at the Fall Convocation.

4. First-Class Honors

First-Class Honors Degrees are awarded to any student in an Honors program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree. If determination of the **last 60 units of course weight** requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

5. With Distinction

Degrees With Distinction are awarded to any student in a General or Specialization program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree.

If determination of the last 60 units of course weight requires consideration of one or more courses from a given term then all work from that term is included in

Graduation

1. Application for Graduation

Students must be in satisfactory standing in their program (i.e., meet the continuation requirements in their final Fall/Winter) in order to graduate. Students who intend to receive a BSc (General, Specialization, or Honors) Degree must apply for the Degree on [Bear Tracks](#) by February 1 for Spring Convocation or by September 1 for Fall Convocation. If degree requirements have been met and the student has not applied to graduate, the Faculty may apply on their behalf. All official transcripts from other postsecondary institutions are due by May 1 for Spring Convocation or by October 1 for Fall Convocation. Students who intend to apply for admission to an alternate degree program in the Faculty of Science for convocation purposes only must meet all of the admission, continuation, residency and graduation criteria for that BSc program.

2. Degree Requirements

All BSc Degrees require a minimum of 120 units of course weight. Courses with weights of 0 units are offered for credit only, and, although they may be required in specific degree programs, cannot be used to meet the minimum units of course weight requirement in any degree program.

3. Convocation

All requirements for graduation at Spring Convocation must be met by the end of Fall/Winter. Those completing degree requirements during Spring/Summer will graduate at the Fall Convocation.

4. First-Class Honors

First-Class Honors Degrees are awarded to any student in an Honors program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree. If determination of the **last 60 units of course weight** requires consideration of one or more courses from a given term then all work from that term is included in the calculation for the purposes of qualifying for First-Class Honors. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

5. With Distinction

Degrees With Distinction are awarded to any student in a General or Specialization program who obtained a GPA of at least 3.5 and no failing grades on the last 60 units of course weight, excluding courses declared extra-to-degree.

If determination of the last 60 units of course weight requires consideration of one or more courses from a given term then all work from that term is included in

the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are therefore given in [Programs](#) below. Regulations for Honors, Specialization, and General programs are found in [Faculty of Science](#).

-
-
-
-
-

Science Internship Program

The Science Internship Program (SIP) offers science undergraduate students work experience opportunities in addition to their academic courses.

To be eligible to register in this program a student must:

1. Have successfully completed a minimum of 48 units of course weight, and not more than 105 units of course weight, of a Science General, Honors or Specialization degree program with a declared major.
2. Be in good standing and have a minimum 2.3 GPA in the previous Fall/Winter Terms.

Students accepted into the program will receive access to approved position descriptions from employers wishing to hire SIP students. Employers are responsible for interviewing and selecting students for the positions. The internship may begin in May, September or January and must be of at least 8 months duration, but may extend to up to 16 months.

Students are limited to one 8 (may consist of two separate 4 month placements), 12 (continuous) or 16 (continuous) month internship placement during their undergraduate degree. Work during the internship period is full time, for which the student is paid by the employer at competitive

the calculation for the purposes of qualifying for With Distinction. Normally, only U of A courses will be used in the calculation of the GPA for the last 60 units of course weight of the program.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are therefore given in [Programs](#) below. Regulations for Honors, Specialization, and General programs are found in [Faculty of Science](#).

-
-
-
-
-

Science Internship Program

The Science Internship Program (SIP) offers science undergraduate students work experience opportunities in addition to their academic courses.

To be eligible to register in this program a student must:

1. Have successfully completed a minimum of 48 units of course weight, and not more than 105 units of course weight, of a Science General, Honors or Specialization degree program with a declared major.
2. Be in good standing and have a minimum 2.3 GPA in the previous Fall/Winter Terms.

Students accepted into the program will receive access to approved position descriptions from employers wishing to hire SIP students. Employers are responsible for interviewing and selecting students for the positions. The internship may begin in May, September or January and must be of at least 8 months duration, but may extend to up to 16 months.

Students are limited to one 8 (may consist of two separate 4 month placements), 12 (continuous) or 16 (continuous) month internship placement during their undergraduate degree. Work during the internship period is full time, for which the student is paid by the employer at competitive

rates. The student, employer and the Faculty must agree to terms of the internship. During the period of the internship, the student registers in a work experience (WKEXP) course each term and is considered a full-time student at the University of Alberta. All students must register in a minimum of two WKEXP courses that have associated fees.

To successfully complete the SIP, students must complete a minimum of eight months of the following WKEXP courses: [WKEXP 955](#), [WKEXP 956](#), [WKEXP 957](#) and [WKEXP 958](#). An eight month placement may be comprised of two four month placements. Students who have completed one four month WKEXP and are not able to secure a second will receive acknowledgment of one WKEXP course on their transcript but will not receive the SIP designation. The ultimate responsibility for securing work rests with the student and there is no guarantee that all qualified students will be placed.

Work experience courses are assigned no units of course weight and are graded credit/no credit. Grades are determined by the student's job performance as evaluated by the employer, and/or by the successful completion of assignments as assigned by the Faculty or designate.

The Science Internship Program Coordinator maintains contact at approximately four-month intervals with the student and the person designated by the employer to be responsible for the student's progress. During this time if the student's performance is not satisfactory as evaluated by the employer, the internship may be terminated and the student would then return to classes at the next available opportunity. Following completion of the work experience students return to the university to complete their degree program of studies.

Students should be aware that under the *Protection for Persons in Care Act*, all new employees, volunteers and other people engaged for services by designated agencies (hospitals, nursing homes, lodges, group homes, etc.) must complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. In addition, certain other agencies, organizations, and educational facilities may require students to present a Police Information Check prior to entering a practicum, work placement term, internship, or field experience placement. Students who have concerns related to their ability to provide a clear Police Information Check should consult with the Associate Dean, Undergraduate. Students will be informed of the need for a Police Information Check prior to specific practicum (field experience) placement. See Requirement for Police Information Checks for more information on the general requirements concerning Police

rates. The student, employer and the Faculty must agree to terms of the internship. During the period of the internship, the student registers in a work experience (WKEXP) course each term and is considered a full-time student at the University of Alberta. All students must register in a minimum of two WKEXP courses that have associated fees.

To successfully complete the SIP, students must complete a minimum of eight months of the following WKEXP courses: [WKEXP 955](#), [WKEXP 956](#), [WKEXP 957](#) and [WKEXP 958](#). An eight month placement may be comprised of two four month placements. Students who have completed one four month WKEXP and are not able to secure a second will receive acknowledgment of one WKEXP course on their transcript but will not receive the SIP designation. The ultimate responsibility for securing work rests with the student and there is no guarantee that all qualified students will be placed.

Work experience courses are assigned no units of course weight and are graded credit/no credit. Grades are determined by the student's job performance as evaluated by the employer, and/or by the successful completion of assignments as assigned by the Faculty or designate.

The Science Internship Program Coordinator maintains contact at approximately four-month intervals with the student and the person designated by the employer to be responsible for the student's progress. During this time if the student's performance is not satisfactory as evaluated by the employer, the internship may be terminated and the student would then return to classes at the next available opportunity. Following completion of the work experience students return to the university to complete their degree program of studies.

Students should be aware that under the *Protection for Persons in Care Act*, all new employees, volunteers and other people engaged for services by designated agencies (hospitals, nursing homes, lodges, group homes, etc.) must complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. In addition, certain other agencies, organizations, and educational facilities may require students to present a Police Information Check prior to entering a practicum, work placement term, internship, or field experience placement. Students who have concerns related to their ability to provide a clear Police Information Check should consult with the Associate Dean, Undergraduate. Students will be informed of the need for a Police Information Check prior to specific practicum (field experience) placement. See Requirement for Police Information Checks for more information on the general requirements concerning Police

Information Checks and the fees associated with them.

Detailed information about the Science Internship Program is available at uab.ca/ScienceInternship.

Information Checks and the fees associated with them.

Detailed information about the Science Internship Program is available at uab.ca/ScienceInternship.

Science After Degrees

1. All of the admission, program, academic standing and graduation standards that apply to a regular Bachelor of Science degree also apply to After Degree programs, except as noted in [Graduation Year](#).
2. All students in After Degree programs must follow the program to which they have been admitted and must demonstrate progress towards completion of the degree in each Fall/Winter (see [Graduation Year](#)).
3. To complete an After Degree, a minimum 30 units of course weight will be required if the student holds a BSc degree from the Faculty of Science at the University of Alberta, and a minimum of 60 units of course weight will be required if the student holds an undergraduate degree from another Faculty or University. The actual number of credits required to complete an After Degree is dependent on the coursework that was completed prior to the After Degree program and will be determined at the time of admission.
4. In a BSc General After Degree program, students with a previous BSc General degree from the Faculty of Science at the University of Alberta must complete a minimum of 9 senior units of course weight in their major and a minimum of 6 senior units of course weight in their minor while registered in the After Degree program. Students holding a degree from outside the Faculty of Science at the University of Alberta must complete a minimum of 18 senior units of course weight in their major and a minimum of 12 senior units of course weight in their minor while registered in the After Degree program.
5. In a BSc Specialization or BSc Honors After Degree program, students with a previous undergraduate degree from the Faculty of Science at the University of Alberta must complete a minimum of 15 senior units of course weight in the area of concentration of the new degree while registered in the After Degree program. Students holding a degree from outside the Faculty of Science at the University of Alberta must complete a minimum of 24 units of course weight in the area of concentration of the new degree while registered in the After Degree program.

Reviewed/Approved by:

REQUIRED: Faculty Council (or delegate) and approval date, including any partner faculties for combined programs.
Faculty Approval: October 28, 2022

Other consultation groups, departments, or internal faculty approving bodies and approval dates.