
The following Motions and Documents were considered by the GFC Programs Committee at its Thursday, October 12, 2023 meeting:

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

- Augustana and Education
- Medicine and Dentistry
- Kinesiology, Sport, and Recreation
- Rehabilitation Medicine

CARRIED MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the attached submissions from the Faculties of Augustana and Education, Medicine and Dentistry, Kinesiology, Sport, and Recreation, and Rehabilitation Medicine.

FINAL Item 4

Agenda Title:

- A. Proposed New Course Designator, DA (Dental Assisting), and New Courses**
- B. Program and Regulation Calendar Language for the Certificate in Dental Assisting**

CARRIED MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, a new course designator (DA) for the new Dental Assisting Certificate and courses set forth in attachment 1, as submitted by the Faculty of Medicine and Dentistry's School of Dentistry.

CARRIED MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the proposed program and regulation calendar language for the Certificate in Dental Assisting, as presented by the Faculty of Medicine and Dentistry, for implementation in Winter 2024.

FINAL Item 5

Agenda Title: **Proposed New Bioprocessing & Biomanufacturing Option and Suspension of Biomedical Option for the BSc in Chemical Engineering**

CARRIED MOTION:

THAT the GFC Program Committee, with delegated authority from General Faculties Council, approve the proposed second-level specialization, Bioprocessing & Biomanufacturing Option, for the Bachelor of Science in Chemical Engineering for implementation July 2024.

CARRIED MOTION:

THAT the GFC Program Committee with delegated authority from General Faculties Council, approve the suspension of the second-level specialization, Biomedical Option for the Bachelor of Science in Chemical Engineering for implementation July, 2024.

FINAL Item 6

Agenda Title: **Time in Program While on Leave, Faculty of Graduate Studies and Research**

CARRIED MOTION:

THAT the GFC Programs Committee recommend that General Faculties Council approve the changes to regulations regarding Graduate Student time in program while on leave, for implementation upon final approval, and inclusion in the 2024-2025 Calendar.

FINAL Item 7



Decision Discussion Information

ITEM OBJECTIVE: To approve course, minor program, and minor regulations changes.

DATE	October 12, 2023
TO	GFC Programs Committee
RESPONSIBLE PORTFOLIO	Provost and Vice-President (Academic)

MOTION: THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the attached submissions from the Faculties of Augustana and Education, Medicine and Dentistry, Kinesiology, Sport, and Recreation, and Rehabilitation Medicine.

EXECUTIVE SUMMARY:

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.

See individual item for Faculty Council approval information.

Supporting Materials:

Attachments:

1. Augustana and Education
2. Medicine and Dentistry
3. Kinesiology, Sport, and Recreation
4. Rehabilitation Medicine

Faculty (& Department or Academic Unit):	Augustana Faculty/Faculty of Education
Contact Person:	
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 • Regulation
For which term is this intended to take effect?	Fall 2024, with admissions beginning in 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

Building on the existing Bachelor of Education (BEd) in Elementary Education degree offered at the University of Alberta, Augustana Faculty and the Faculty of Education propose to provide a new route for students to complete this degree by spending the first two years of their program at Augustana Campus and the final two years of their program on North Campus. Augustana has consistently had a number of students beginning their university studies in Camrose and then transferring into the Faculty of Education in Edmonton after one or two years to finish their BEd Elementary degree. We propose to formalize this arrangement by identifying a series of Augustana courses that would be regarded as equivalent to courses on North Campus and therefore satisfy the requirements of the first two years of the BEd Elementary program. Students accepted into this route would study in Year 1 and Year 2 at Augustana. If they meet the necessary transfer requirements, they would then study in Year 3 and Year 4 in the Faculty of Education in order to complete the BEd Elementary degree.

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New**Admission Requirements****Bachelor of Education in Elementary Education (Augustana/Education)****High School Applicants**

High school applicants will be considered for admission based on their average on five subjects noted below.

Subject Requirements

1. English Language Arts 30-1
2. Three subjects from Group A, and/or C.
3. One additional subject from Group A, B, C, or Physical Education 30 (5 credits), or 30-level CTS course (5 credits).
4. Mathematics 30-2 may be used for admission to the Bachelor of Education in Elementary Education (Augustana/Education) program

High school-level courses are based on the Alberta Education curriculum. Prospective students who completed high school education from outside Alberta should review the Admission Course Equivalents for acceptable high school courses in the three categories at www.admissions.ualberta.ca.

For general high school admission requirements refer to [High School Applicants](#).

Note: Proficiency in an Indigenous language recognized in Canada (e.g., Cree, Slavey, etc.) will be accepted to meet a Group A admission requirement. Proficiency is measured either by a test, administered by the University if such can be arranged, or by boards of examiners appointed by the University. Candidates having passed the required test of an Indigenous language have their averages calculated on the remaining four matriculation subjects.

Postsecondary Transfer Applicants**General Requirements:**

- a. Applicants must present successful completion of at least 24 units transferable course weight applicable to the specific

degree program for which they have applied. Those applicants who do not present at least 24 units of course weight, are considered as high school applicants. See [High School Applicants](#) for admission information.

- b. Satisfactory standing in the Faculty or postsecondary institution from which they wish to transfer.
- c. An AGPA of at least 2.0. (See [Transfer from a Postsecondary Institution](#) for information about the calculation of the AGPA.)

Notes

1. **Recommended Courses for the first year(s) of study:** Applicants should present those postsecondary courses relevant to the Bachelor of Education in Elementary Education (Augustana/Education) program.
2. **Admission with Transfer Credit:** A maximum of 30 units of course weight obtained at another postsecondary institution may be granted as transfer credit toward the Bachelor of Education in Elementary Education (Augustana/Education) program. The year of program to which an applicant is admitted depends on the number of transferable credits applicable to the BEd program for which they have applied. Year 2: 24-30 units of course weight.
3. Students who are granted transfer credit should be aware that receiving transfer credit toward a BEd program does not guarantee that all of the courses will be counted toward their placement on the teacher salary grid by the Teacher Qualifications Service (TQS). The TQS is a provincial agency that has the sole authority for evaluating courses for teacher salary purposes.

After-Degree Applicants

General Requirements

All applicants must present the following:

A three- or four-year degree from an accredited postsecondary institution.

An Admission GPA (AGPA) of at least 2.0, or equivalent, based on the most recent graded and transferable 24 units of course weight.

Note: Bed programs in the Elementary Route vary in length (see [BEd](#) and [BEd \(After Degree\)](#)). The length of the program will depend on the courses that a student presents at the time of admission. The Elementary After Degree program is normally two years in length.

Students whose BEd After Degree program consists of fewer than 60 units of course weight may need additional postsecondary courses in order to receive two full years of credit toward their placement on the teacher salary grid when they are evaluated by the Teacher Qualifications Service (TQS). The TQS is a provincial agency that has the sole authority for evaluating post-secondary studies for teacher salary purposes.

Nonmatriculated Applicants

General Requirements

1. English Language Arts 30-1 or 6 units in transferable English at the 100-level
2. Another 30-level subject from Group A, B, or C (or equivalent).
3. Presentation of Faculty minimum average on (1) and (2), and a competitive AGPA if any postsecondary-level coursework is presented.
4. Presentation of no more than 21 units of course weight of graded and transferable postsecondary-level coursework.

Note: Any applicant who has successfully completed 24 units of course weight of graded and transferable postsecondary-level coursework or more at the postsecondary level will be considered a transfer applicant (see [Transfer from a Postsecondary Institution](#) and [High School Applicants](#)).

Admission of Indigenous Applicants

The Augustana Faculty encourages Indigenous students' study toward the Bachelor of Education degree. The Faculty recognizes that Indigenous applicants (including status and non-status Indians, Inuit, and Métis) have traditionally been under-represented in the teaching field. To assist more Indigenous students to achieve education degrees, the Admissions Committee will consider additional qualified applicants over and above the Indigenous

students who may be admitted in the regular competition for places in the Faculty. Until the Indigenous enrolment of the Faculty reaches 10% of total enrolment, up to 5% of admissions to the Faculty will be allocated to Indigenous applicants. Indigenous students who wish to be considered for these places must attain the minimum admission requirements of their chosen route. Also see [Admission of Indigenous Applicants](#).

Readmission After an Absence of 12 Months or Longer

A candidate returning to the Augustana Faculty after a break of 12 months or longer must apply and compete for readmission unless prior approval to stop out was granted, in which case only application for readmission is necessary.

Special Students

See [Special Students](#).

To be considered for admission as a Special Student in the Faculty of Education, applicants must normally

1. Possess a Bachelor of Education degree from an accredited postsecondary institution;
2. Present a minimum AGPA of 2.0;
3. Be in satisfactory standing in their previous postsecondary institution;
4. Meet the English Language proficiency requirements as specified in [Language Proficiency Requirements](#).

In certain circumstances, practising teachers from outside Alberta may be admitted as Special Students to meet the certification requirements specified by Alberta Education. Students in these cases must be recommended by the Teacher Certification and Development Branch of Alberta Education.

Priority in admissions is given to applicants to degree programs.

Priority in course registrations is given to students who have been admitted to degree programs.

	<p>Visiting Students</p> <p>Students from other postsecondary institutions are eligible to be considered for admission to the Faculty of Education as Visiting Students if</p> <ul style="list-style-type: none"> They are registered in an Education degree/transfer program at their home institution; They have completed a minimum of 24 units of course weight at their home institution; They present a minimum AGPA of 2.0; Their academic record shows satisfactory standing; Their home institution provides a letter of permission. <p>Notes</p> <p>Normally, Visiting Students are not permitted to register for Field Experience courses. To arrange for a school placement, students must ask their home institution to contact the Assistant Dean, Field Experiences, before they apply.</p> <p>A Visiting Student applicant who has had two or more unsuccessful attempts in any previous Field Experience course(s), at any institution(s), will not be allowed to register in EDFX courses.</p> <p>Applicants Who Have Previously Been Required to Withdraw</p> <p>Applicants who have been twice required to withdraw from any postsecondary program(s) or institution(s) will not <i>normally</i> be considered for admission or readmission to the Augustana Faculty.</p>
<p>New</p>	<p>Bachelor of Education in Elementary Education (Augustana/Education)</p> <p>General Information Underlying Principles</p> <p>The following principles underlie all teacher preparation programs:</p> <ol style="list-style-type: none"> 1. The education of a teacher is a continuous, life-long process. In addition to emphasizing basic or fundamental preparation, the initial pre-service experience should aid the development of attitudes that encourage self-

evaluation and improvement, and the acquisition of knowledge and skills that facilitate life-long learning.

2. All teacher preparation degree programs provide intending teachers with essential practical skills, a knowledge of theory and its relationship to practice, liberal studies, and subject-matter competence.
3. Augustana Faculty and the Faculty of Education are committed to providing quality teacher preparation programs; both faculties recognize the importance of continuously monitoring, evaluating and refining its offerings to adequately reflect changes in society and advances in knowledge.
4. The Bachelor of Education degree consists of a minimum of 120 units.

In addition, the Bachelor of Education in Elementary Education (Augustana/Education) program particularly seeks to support students graduating from high school in rural regions and to encourage students in the program to find placements in rural areas

Program Planning

The Faculties of Augustana and Education provide students with an official program outline when they are admitted. Using this, students are expected to be able to identify remaining course requirements for their particular degree program.

Students are responsible for being acquainted with all applicable regulations and meeting the requirements for the degree as outlined. Any exceptions to the requirements must be approved in writing by the Augustana Associate Dean (Academic) or the Associate Dean (Education Student Services), with one copy to be placed in the student's file and one to be given to the student.

Elementary Education

Elementary Education prepares teachers to teach all subjects and to facilitate the learning of all children at the elementary school level within our multicultural society. Teaching proficiency depends on knowledge of subject matter, pedagogy, critical thinking and problem-solving skills, professional ethics, sensitivity to and respect for children and the sociocultural contexts in which they live, and an understanding of schooling in their social/political/economic

environment. Developing attributes, fostering a sense of community, and developing a strong professional commitment reflected in a personal philosophy of education are the intent of Elementary Education.

Components of the Program

All students in the Elementary Route are enrolled in a generalist program that prepares prospective teachers in the required elementary school subjects. This degree consists of 120 units. Students should consult the program sheet provided at the time of their admission and seek advice from the Augustana Student Academic Services Office or the Faculty of Education Student Services Office.

Note: No more than 6 units in junior English, or equivalent, may be taken for credit in a Bachelor of Education degree program.

Program Requirements (120 units)

Years 1 and 2 (Augustana Faculty)

Introductory Education Courses (6 units)

- AUEDC 210 - Introduction to Educational Technology
- AUEFX 200 - Introduction to the Profession of Teaching

Generalist Elements Courses (42 units)

a. Aboriginal and Indigenous Histories and Culture (3 units)

3 units chosen from

- AUIND 101 - Introduction to Indigenous Studies
- AUIND 300 - Selected Topics in Indigenous Studies
- AUSOC 101 - Introducing Sociology: Principles and Practice
- AUSOC 103 - Introducing Sociology: Institutions and Insight
- AUHIS 369 - History of Canada's Indigenous Peoples

b. Fine Arts (6 units)

6 units chosen from

- Any AUART
- Any AUDRA
- Any AUMUS

c. Language/Literature (9 units)

3 units chosen from

- AUENG 102
- 6 units chosen from:
 - Any AUENG 200-level or higher
 - AULAN 101 - Introduction to Linguistic Analysis

d. Mathematics (6 units)

6 units chosen from

- AUMAT 107 - Higher Arithmetic
- AUMAT 116 - Calculus Concepts and Modeling
- AUMAT 120 - Linear Algebra I
- AUSTA 153 - Introductory Applied Statistics or AUSTA 215 - Statistical Methods for the Natural Science
- Any AUMAT 200-level or higher

e. Natural Science (6 units)

A minimum of 3 units chosen from

- Any AUBIO
- Any AUCHE
- Any AUENV
- Any AUPHY
- AUPED 112 - Structural Human Anatomy
- AUPED 215 - Introduction to Human Physiology I
- AUPED 216 - Introduction to Human Physiology II
- AUPED 344 - Introduction to Human Nutrition

3 units chosen from list e. above or from

- AUPHI 350 - Philosophy of Science

f. Physical and Health Education (6 units)

3 units chosen from

- Any AUPAC
- Any AUPED (AUPED 222 - Introduction to Movement Activities of Youth [Ages 5-12] is recommended)

3 units chosen from

- AUPED 241 - Lifetime Fitness and Wellness
- AUSOC 271 - The Family

g. Social Science (6 units)

3 units in Canadian history chosen from:

- AUHIS 260 - An Introduction to the Study of Canadian History to 1867

- AUHIS 261 - An Introduction to the Study of Canadian History, 1867 to the Present
- AUHIS 271 The History of Women in Canadian Society
- AUHIS 375 - Introduction to Canadian Environmental History
- AUHIS 360/361 - Selected Topics in Canadian History

3 units chosen from:

- AUCLA 100 - Greek Civilization
- AUCRI 200 - Young Offenders and the law
- AUCRI 353 - Law, Politics, and the Judicial System
- AUECO 101 - Introduction to Microeconomics
- AUECO 102 - Introduction to Macroeconomics
- AUENV 324 - Resource and Environmental Management
- Any AUHIS additional to the Canadian History requirement completed above
- AUIDS 230 - Introduction to Gender and Women's Studies
- AUIDS 302 - Exploring Body Issues
- AUIND 101 - Introduction to Indigenous Studies
- AUIND 367 - The Fur Trade
- AUIND 370 - Oral History
- AUPHI 101 - Introduction to Western Philosophy I: Ancient and Medieval Philosophy
- AUPHI 102 - Introduction to Western Philosophy II: Modern Philosophy
- AUPHI 210 - Epistemology: Theories of Knowledge
- AUPHI 240 - Ancient Political Philosophy
- AUPHI 241 - Modern Political Philosophy
- AUPHI 340 - Contemporary Social and Political Philosophy
- AUPHI 355 - Philosophy and the Environment
- AUPHI 357 - Philosophy of Religion I
- AUPHI 358 - Philosophy of Religion II
- Any AUPOL
- AUREL 100 - Introduction to Religion
- AUREL 250 - Theories of Religion
- AUREL 263 - Spritiulization and Globalization
- AUSOC 101 - Introducing Sociology: Principles and Practice
- AUSOC 103 - Introducing Sociology: Institutions and Insight
- AUSOC 105 - Social Anthropology

- AUSOC 377 - Theoretical Approaches to Gender

Augustana Core Foundation Courses (6 units)

- AUIDS 101 - First Year Seminar
- AUIDS 201 - Collaborative Learning

Open Options or Education Elective (6 units)

Students may take the following two recommended courses to fulfill the Education Elective requirement and 3 units of options. Alternatively, students may complete 6 units of Open Options and complete the Education Elective requirement in Year 3 or 4.

- AUPSY 103 - Introduction to Psychology
- AUEPS 258 - Educational Psychology for Teaching (see note 1).

Notes:

1. AUEPS 258 is considered an equivalent to Education Elective EDPY 302.
2. Options may be taken in Years 1 to 4 and can be used to further develop generalist teaching interests and/or create areas of specialization.

Years 3 and 4 (Faculty of Education)

Students should see Note 1 below for information about proceeding into Year 3 of the degree program.

Introductory Education Courses (3 units)

- EDU 211 - Aboriginal Education and Context for Professional and Personal Engagement

Senior Education Courses (30 units)

- EDEL 305 - Language Arts in the Elementary School
- EDEL 316 - Communication Through Mathematics Education
- EDEL 330 - Curriculum and Pedagogy in Elementary School Science
- EDEL 335 - Curriculum and Pedagogy in Elementary School Social Studies
- EDPY 301 - Introduction to Inclusive Education: Adapting Classroom Instruction for Students with Special Needs
- EDPY 302 - Learning and Development in Childhood
- EDPY 303 - Educational Assessment
- EDPS 410 - Ethics and Law in Teaching

6 units chosen from

- EDEL 302 - Curriculum and Pedagogy in Elementary School Art
- EDEL 321 - Introduction to Curriculum and Pedagogy in Elementary School Physical Education
- EDEL 325 - Curriculum and Pedagogy in Elementary School Music
- EDEL 345 - Introduction to Curriculum and Pedagogy in Elementary School Health Education

Field Placements (15 units)

- EDFX 325 - Elementary Route: Introductory Field Experience
- EDFX 425 - Elementary Route: Advanced Field Experience

Options (12 units)

- 3 units in EDEL (400-Level) Option
- 0 - 3 units in Education Elective
- 6 - 9 units in Open Options

Notes

1. The requirement to proceed from Augustana to the Faculty of Education in Year 3 will be a 2.0 GPA. Augustana students who are part of this program will not enter into the general competitive pool for Year 3 transfer students into the Faculty of Education.
2. EDEL 305 and EDEL 316 must be taken in Year 3 as pre/co-requisites to EDFX 325.
3. The Introductory Professional Term is normally offered in Year 3 Winter Term only and consists of EDFX 325, 6 units EDEL courses, and EDPY 303.
4. The Advanced Professional Term is normally offered in Year 4 Fall Term only and consists of EDFX 425, 3 units EDEL, and EDPY 301.
5. Not all courses are offered each term or in a 13-week or condensed format.
6. Students should be aware of course prerequisites and refer to their individual program sheets for the proper sequencing of courses.

<p>New [for inclusion under 'Faculty of Education - Programs' section of the Calendar]</p>	<p>Bachelor of Education in Elementary Education (Augustana/Education)</p> <p>The Faculty of Education and the Augustana Faculty offer a version of the Bachelor of Education in Elementary Education degree program that is designed to allow students to complete the degree by spending the first two years of their program in the Augustana Faculty and the final two years of their program in the Faculty of Education.</p> <p>The degree program is structured to identify 60 units of Augustana courses that satisfy the requirements of the first two years of a University of Alberta Bachelor of Education in Elementary Education, with students then proceeding to the Faculty of Education to complete the final 60 units.</p> <p>For more information, including program requirements, see [link to above Bachelor of Education in Elementary Education (Augustana/Education) information on the 'Augustana Faculty - Programs' page in the Calendar]</p>
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Reviewed/Approved by:

<p>REQUIRED: Augustana Faculty Council - August 16, 2023 Education Faculty Council's UAAC (delegated approver) - September 21, 2023</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):	FoMD - Department of Dentistry	
Contact Person:	Deniz Ozgan dentgrad@ualberta.ca	
Level of change (choose one only)	<input type="radio"/>	Undergraduate
	<input type="radio"/>	Graduate
Type of change request (check all that apply)	<input type="radio"/>	Program
	<input type="radio"/>	Regulation
For which term is this intended to take effect?	Winter 2024	
Does this proposal have corresponding course changes? (Should be submitted at the same time)		

Rationale

Updates made to application deadline information to align with other programs across Canada.

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=42483&returnto=11393

Current	Proposed
<p>Master of Science in Medical Sciences - Periodontology</p> <hr/> <p>The Department of Dentistry offers a thesis-based MSc degree in Medical Sciences - Periodontology. Through a combination of didactic and clinical courses, the program is structured to prepare the dental graduate for Periodontology practice and/or an educational academic appointment. This is a thesis-based program. In addition the clinical requirements involve successful completion of selected teaching cases. (See Medical Sciences).</p> <p>Entrance Requirements</p> <hr/> <p>The Department's minimum admission requirements are a Doctor of Dental Surgery (DDS) or equivalent</p>	<p>Master of Science in Medical Sciences - Periodontology</p> <hr/> <p>The Department of Dentistry offers a thesis-based MSc degree in Medical Sciences - Periodontology. Through a combination of didactic and clinical courses, the program is structured to prepare the dental graduate for Periodontology practice and/or an educational academic appointment. This is a thesis-based program. In addition the clinical requirements involve successful completion of selected teaching cases. (See Medical Sciences).</p> <p>Entrance Requirements</p> <hr/> <p>The Department's minimum admission requirements are a Doctor of Dental Surgery (DDS) or equivalent</p>

with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution (see: [Academic Requirements](#) for details on Graduate GPA calculation).

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

- TOEFL (internet-based) minimum score 95 and the following minimum score on each of the individual skill areas: Listening 22, Reading 22, Speaking 26, and Writing 24.
 - CAEL minimum score of 80 with at least 70 on each subtest;
 - or an IELTS (Academic) minimum score of 7.5 with at least 7 on each band.
- All applicants are also required to submit the following:
 - a current curriculum vitae
 - a statement of intent
 - three letters of recommendation (two must be professional)
 - An official letter from the Dean of the Dental School stating that the applicant had no professional conduct issues.
 - Applicants that are not licensed by Alberta Dental Association and College (ADA&C), need to be registered on the Education and Research Register from the ADA&C by August 1 prior to starting the program.
 - Applicants who are not licensed but in a Canada/USA accredited GPR program are required to obtain a letter from the Program Director stating they are in good standing with no professional conduct issues.
 - A personal interview is required for

with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution (see: [Academic Requirements](#) for details on Graduate GPA calculation).

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

- TOEFL (internet-based) minimum score 95 and the following minimum score on each of the individual skill areas: Listening 22, Reading 22, Speaking 26, and Writing 24.
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- All applicants are also required to submit the following:
 - a current curriculum vitae
 - a statement of intent
 - three letters of recommendation (two must be professional)
 - An official letter from the Dean of the Dental School stating that the applicant had no professional conduct issues.
 - Applicants that are not licensed by Alberta Dental Association and College (ADA&C), need to be registered on the Education and Research Register from the ADA&C by August 1 prior to starting the program.
 - Applicants who are not licensed but in a Canada/USA accredited GPR program are required to obtain a letter from the Program Director stating they are in good standing with no professional conduct issues.
 - A personal interview is required for

<p>short-listed applicants. These applicants will be advised of the arranged interview date by e-mail.</p> <p>Admission is dependent upon the approval of the Graduate Periodontology Selection Committee, the Department of Dentistry's Graduate Studies Committee and the Medical Sciences Graduate Program Committee.</p> <p>For the MSc in Periodontics the application deadline is September 1 for the following September admission.</p> <p>[...]</p>	<p>short-listed applicants. These applicants will be advised of the arranged interview date by e-mail.</p> <p>Admission is dependent upon the approval of the Graduate Periodontology Selection Committee, the Department of Dentistry's Graduate Studies Committee and the Medical Sciences Graduate Program Committee.</p> <p>For the MSc in Periodontics the application deadline is June 1 for the following September admission.</p> <p>[...]</p>
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Reviewed/Approved by:

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – April 27, 2023</p>
<p>Internal Approvals:</p> <p>Dentistry Graduate Studies Committee – May 31, 2022 Dentistry Department Council – May 31, 2022 FoMD Graduate Programs Committee – April 19, 2023</p> <p>Graduate Program Support Team - June 5, 2023</p> <p>FGSR Council - September 13, 2023</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 - Department of Dentistry	
Contact Person:	Deniz Ozgan dentgrad@ualberta.ca	
Level of change (choose one only)	<input type="radio"/>	Undergraduate
	<input checked="" type="radio"/>	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?	Winter 2024	
Does this proposal have corresponding course changes? (Should be submitted at the same time)		

Rationale

Updates made to application deadline information to align with other programs across Canada.

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=42483&returnto=11393	
<p>Current</p> <p>Doctor of Philosophy in Medical Sciences - Periodontology</p> <hr/> <p>The Department of Dentistry offers the degree of PhD in Medical Sciences - Periodontology. It is a full-time research training program with clinical training integrated into it.</p> <p>Entrance Requirements</p> <hr/> <p>The Department's minimum admission requirements are a Doctor of Dental Surgery (DDS) or equivalent and a Master's degree (except in exceptional cases,</p>	<p>Proposed</p> <p>Doctor of Philosophy in Medical Sciences - Periodontology</p> <hr/> <p>The Department of Dentistry offers the degree of PhD in Medical Sciences - Periodontology. It is a full-time research training program with clinical training integrated into it.</p> <p>Entrance Requirements</p> <hr/> <p>The Department's minimum admission requirements are a Doctor of Dental Surgery (DDS) or equivalent and a Master's degree (except in exceptional cases,</p>

which will be considered on a case-by-case basis) with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution, (see: [Academic Requirements](#) for details on Graduate GPA calculation).

The Master's Bypass allows for outstanding Master's Candidates to request a change of program category to the PhD program without completing the Master's degree. Additional research experience may be required within the PhD program for students selecting this option. See the [Graduate Program Manual 7.2 Change of Category](#). Additional information on the process and timelines is available on the School of Dentistry Graduate Program Manual.

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

- TOEFL (internet-based) minimum score 95 and the following minimum score on each of the individual skill areas: Listening 22, Reading 22, Speaking 26, and Writing 24.
- CAEL minimum score of 80 with at least 70 on each subtest;
- or an IELTS (Academic) minimum score of 7.5 with at least 7 on each band.

All applicants are also required to submit the following:

- a current curriculum vitae
- a statement of intent
- three letters of recommendation (two must be professional)
- Formal commitment from a full-time orthodontic supervisor is required.
- An official letter from the Dean of the Dental School stating that the applicant had no professional conduct issues.

which will be considered on a case-by-case basis) with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution, (see: [Academic Requirements](#) for details on Graduate GPA calculation).

The Master's Bypass allows for outstanding Master's Candidates to request a change of program category to the PhD program without completing the Master's degree. Additional research experience may be required within the PhD program for students selecting this option. See the [Graduate Program Manual 7.2 Change of Category](#). Additional information on the process and timelines is available on the School of Dentistry Graduate Program Manual.

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

- TOEFL (internet-based) minimum score 95 and the following minimum score on each of the individual skill areas: Listening 22, Reading 22, Speaking 26, and Writing 24.
- CAEL minimum score of 80 with at least 70 on each subtest;
- or an IELTS (Academic) minimum score of 7.5 with at least 7 on each band.

All applicants are also required to submit the following:

- a current curriculum vitae
- a statement of intent
- three letters of recommendation (two must be professional)
- Formal commitment from a full-time orthodontic supervisor is required.
- An official letter from the Dean of the Dental School stating that the applicant had no professional conduct issues.

<ul style="list-style-type: none"> ● Applicants who are not licensed but in a Canada/USA accredited GPR program are required to obtain a letter from the Program Director stating they are in good standing with no professional conduct issues. ● Applicants that are not licensed by Alberta Dental Association and College (ADA&C), need to be registered on the Education and Research Register from the ADA&C by August 1 prior to starting the program. ● A personal interview is required for short-listed applicants. These applicants will be advised of the arranged interview date by e-mail. <p>Admission is dependent upon the approval of the Graduate Periodontology Admissions SubCommittee, the Department of Dentistry's Graduate Studies Committee and the Medical Sciences Graduate Program Committee.</p> <p>For the PhD in Periodontics the application deadline is September 1 for the following September admission.</p> <p>[...]</p>	<ul style="list-style-type: none"> ● Applicants who are not licensed but in a Canada/USA accredited GPR program are required to obtain a letter from the Program Director stating they are in good standing with no professional conduct issues. ● Applicants that are not licensed by Alberta Dental Association and College (ADA&C), need to be registered on the Education and Research Register from the ADA&C by August 1 prior to starting the program. ● A personal interview is required for short-listed applicants. These applicants will be advised of the arranged interview date by e-mail. <p>Admission is dependent upon the approval of the Graduate Periodontology Admissions SubCommittee, the Department of Dentistry's Graduate Studies Committee and the Medical Sciences Graduate Program Committee.</p> <p>For the PhD in Periodontics the application deadline is June 1 for the following September admission.</p> <p>[...]</p>
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Reviewed/Approved by:

<p>FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – April 27, 2023</p>
<p>Internal Approvals:</p> <p>Dentistry Graduate Studies Committee – May 31, 2022 Dentistry Department Council – May 31, 2022 FoMD Graduate Programs Committee – April 19, 2023</p> <p>Graduate Program Support Team - June 5, 2023</p> <p>FGSR Council - September 13, 2023</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:	Normand Boulé, PhD - Professor & Associate Dean Graduate
Level of change (choose one only) [?]	<ul style="list-style-type: none"> Graduate
Type of change request (check all that apply) [?]	<ul style="list-style-type: none"> Program
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

After our annual review of the calendar we noticed some discrepancies and omissions. These are mostly editorial in nature. For example:

- The term “credits” was replaced in two places by “units” for consistency
- Our recently approved (2022-23) Graduate Certificate in Coaching was missing in the laddering section.
- The terminology for the Ethics and Academic Citizenship Requirement was updated and the specific INT D course requirements were added for the various degrees.
- For some programs we added that “A degree in Kinesiology or related field is considered an asset but not required.” or “A minimum of two years of professional experience is also recommended.” but no longer required to better reflect our current admission practices.
- A few other minor editorial changes

The most substantive change is the removal of the formal residency requirement for our thesis-based degrees. This change felt appropriate due to a combination of factors:

- FGSR no longer has a formal residency requirement
- The COVID-19 pandemic showed us that it is sometimes necessary and possible to have flexibility with the residency requirement
- The availability of new technologies can facilitate some activities that no longer require a presence on campus.

However, we recognize that a presence on campus may be required for some students to complete some of their requirements. For example, some courses will not be offered online or, in some fields, on campus research activities may be required. Therefore, we have replaced the residency requirement with the following “Although there is no formal residency requirement, some courses, research, teaching, funding, or supervisors may require an in-person presence on a University of Alberta campus or other related site.”

Calendar Copy

URL in current Calendar (or leave blank if it is a new page): [Program: Graduate Programs in Kinesiology, Sport, and Recreation - University of Alberta - Acalog ACMS™ \(ualberta.ca\)](#)

Current	Proposed
<p>Graduate Program Requirements</p> <hr/>	<p>Graduate Program Requirements</p> <hr/>
<p>Master's Programs</p>	<p>Master's Programs</p>
<ul style="list-style-type: none"> ● <u>Master of Arts (Kinesiology, Sport, and Recreation)</u> Master of Arts (Kinesiology, Sport, and Recreation) 	<ul style="list-style-type: none"> ● <u>Master of Arts (Kinesiology, Sport, and Recreation)</u> Master of Arts (Kinesiology, Sport, and Recreation)
<p>Both a thesis-based and a course-based option are available in the Master of Arts (MA) degree program. While both are research-oriented programs, the thesis program requires fewer courses and places more emphasis on the development of research skills.</p>	<p>Both a thesis-based and a course-based option are available in the Master of Arts (MA) degree program. While both are research-oriented programs, the thesis program requires fewer courses and places more emphasis on the development of research skills.</p>
<p>Program Requirements</p> <hr/>	<p>Program Requirements</p> <hr/>
<p>The minimum requirements for the thesis-based MA are the completion of 12 units in addition to the thesis. All students must successfully complete either KSR 580 or KSR 581.</p>	<p>The minimum requirements for the thesis-based MA are the completion of 12 units in addition to the thesis. All students must successfully complete either KSR 580 or KSR 581.</p>
<p>The minimum period of residence is two four month terms of full time attendance at the University of Alberta.</p>	
<p>Students enrolled in the course-based MA degree program must complete as a minimum, the equivalent of 30 units. Students must successfully complete at least one of KSR 580 or KSR 581 (each 3 units). In addition, students must successfully complete a capping exercise (6 units). This will take the form of a completed research project, or successful completion of a comprehensive examination.</p>	<p>Students enrolled in the course-based MA degree program must complete as a minimum, the equivalent of 30 units. Students must successfully complete at least one of KSR 580 or KSR 581 (each 3 units). In addition, students must successfully complete a capping exercise (6 units). This will take the form of a completed research project, or successful completion of a comprehensive examination.</p>
<p>There is no residency requirement for the course-based degree program.</p>	<p>Although there is no formal residency requirement, some courses, research, teaching, funding, or supervisors may require an in-person presence on a University of Alberta campus or other related site.</p>
<p>Both thesis-based and course-based MA students are required to complete the ethics and academic integrity training requirement (8 hours), and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).</p>	<p>Both thesis-based and course-based MA students are required to complete the Ethics and Academic Citizenship Requirement (INT D 710), and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).</p>
<p>Length of Program</p> <hr/>	<p>Length of Program</p> <hr/>

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Thesis-based master's candidates must complete all the requirements within four years of the term in which they first register. Course-based master's candidates must complete all the requirements within six years of the term in which they first register.

Laddering into the course-based MA/MARLS In Kinesiology, Sport, and Recreation

Students who complete the [Graduate Certificate in Adapted Physical Activity](#), [Graduate Certificate in Indigenous Sport and Recreation](#), and/or [Graduate Certificate in Sport and Recreation Management](#) in good standing may be able to use the courses from these certificates to receive advanced standing in either MA program. 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](#).

- [Master of Arts in Recreation and Leisure Studies \(Kinesiology, Sport, and Recreation\)](#)
Master of Arts in Recreation and Leisure Studies (Kinesiology, Sport, and Recreation)
-

Both thesis-based and course-based options are available in the Master of Arts in Recreation and Leisure Studies [MA(RLS)] program. While both are research-oriented programs, the thesis program requires fewer courses and places more emphasis on the development of research skills.

Program Requirements

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Thesis-based master's candidates must complete all the requirements within four years of the term in which they first register. Course-based master's candidates must complete all the requirements within six years of the term in which they first register.

Laddering into the course-based MA/MARLS In Kinesiology, Sport, and Recreation

Students who complete the [Graduate Certificate in Adapted Physical Activity](#), [Graduate Certificate in Indigenous Sport and Recreation](#), [Graduate Certificate in Sport and Recreation Management](#) and/or [Graduate Certificate in Coaching](#) in good standing may be able to use the courses from these certificates to receive advanced standing in either MA program. 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](#).

- [Master of Arts in Recreation and Leisure Studies \(Kinesiology, Sport, and Recreation\)](#)
Master of Arts in Recreation and Leisure Studies (Kinesiology, Sport, and Recreation)
-

Both thesis-based and course-based options are available in the Master of Arts in Recreation and Leisure Studies [MA(RLS)] program. While both are research-oriented programs, the thesis program requires fewer courses and places more emphasis on the development of research skills.

Program Requirements

The minimum requirements for the thesis-based MA(RLS) are the completion of 12 units in addition to the thesis. All students must successfully complete [KSR 500](#) and a graduate level research course, [KSR 580](#) or [KSR 581](#) is required.

~~Students must complete a residence requirement of two four-month terms of full-time attendance at the University of Alberta.~~

Students enrolled in the course-based MA(RLS) degree program must complete as a minimum, the equivalent of 30 units. All students must successfully complete [KSR 500](#) and at least one of [KSR 580](#) or [KSR 581](#). In addition, students must successfully complete a capping exercise (6 units). This will take the form of a completed research project or successful completion of a comprehensive examination.

~~There is no residency requirement for the course-based degree program.~~

Both thesis-based and course-based MA(RLS) students are required to complete the ~~ethics and academic integrity training requirement (8 hours)~~, and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Thesis-based master's candidates must complete all the requirements within four years of the term in which they first register. Course-based master's candidates must complete all the requirements within six years of the term in which they first register.

- [Master of Science \(Kinesiology, Sport, and Recreation\)](#)
Master of Science (Kinesiology, Sport, and

The minimum requirements for the thesis-based MA(RLS) are the completion of 12 units in addition to the thesis. All students must successfully complete [KSR 500](#) and a graduate level research course, [KSR 580](#) or [KSR 581](#) is required.

Students enrolled in the course-based MA(RLS) degree program must complete as a minimum, the equivalent of 30 units. All students must successfully complete [KSR 500](#) and at least one of [KSR 580](#) or [KSR 581](#). In addition, students must successfully complete a capping exercise (6 units). This will take the form of a completed research project or successful completion of a comprehensive examination.

Although there is no formal residency requirement, some courses, research, teaching, funding, or supervisors may require an in-person presence on a University of Alberta campus or other related site.

Both thesis-based and course-based MA(RLS) students are required to complete the [Ethics and Academic Citizenship Requirement \(INT D 710\)](#), and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Thesis-based master's candidates must complete all the requirements within four years of the term in which they first register. Course-based master's candidates must complete all the requirements within six years of the term in which they first register.

- [Master of Science \(Kinesiology, Sport, and Recreation\)](#)
Master of Science (Kinesiology, Sport, and Recreation)

Recreation)

The Master of Science (MSc) degree is a thesis-based degree in which emphasis is placed on the development of research skills.

Program Requirements

The minimum requirements for the MSc degree are the completion of 12 units in addition to the thesis. As part of the degree requirements, students must successfully complete [KSR 580](#) or [KSR 581](#) (each 3 units).

~~The minimum period of residence is two four month terms of full time attendance at the University of Alberta.~~

MSc students are required to complete the **ethics and academic integrity training requirement (8 hours)**, and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Candidates must complete all the requirements within four years of the term in which they first register.

- [Master of Coaching \(Kinesiology, Sport, and Recreation\)](#)
Master of Coaching (Kinesiology, Sport, and Recreation)

The Master of Science (MSc) degree is a thesis-based degree in which emphasis is placed on the development of research skills.

Program Requirements

The minimum requirements for the MSc degree are the completion of 12 units in addition to the thesis. As part of the degree requirements, students must successfully complete [KSR 580](#) or [KSR 581](#) (each 3 units).

Although there is no formal residency requirement, some courses, research, teaching, funding, or supervisors may require an in-person presence on a University of Alberta campus or other related site.

MSc students are required to complete the **Ethics and Academic Citizenship Requirement (INT D 710)**, and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of two years is required to complete the program. Candidates must complete all the requirements within four years of the term in which they first register.

- [Master of Coaching \(Kinesiology, Sport, and Recreation\)](#)

Master of Coaching (Kinesiology, Sport, and Recreation)

The Master of Coaching degree is a course-based program which includes a practicum under the supervision of a mentor coach.

Program Requirements

Students enrolled in the MCoach degree program must complete as a minimum, the equivalent of 30 units. Students must successfully complete either [KSR 580](#) or [KSR 581](#) (each 3 units), [KSR 572](#) (6 units) and a capping exercise [KSR 900](#) (6 units). The capping exercise will be a significant piece of scholarly work in the field of coaching. Students are encouraged, but not required to select the remaining 15 units from the following list in consultation with the academic supervisor: [KSR 511](#), KIN 540, [KSR 541](#), [KSR 544](#), [KSR 575](#) or other relevant courses offered under the [KSR 582](#) designation. MCoach students may choose, as optional courses, relevant graduate courses offered by other Faculties. All optional courses must be approved by the academic supervisor.

There is no residency requirement for the MCoach degree program.

MCoach students are required to complete the ~~ethics and academic integrity training requirement (8 hours)~~, and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to factors such as the previous training of the applicant, the availability of courses and the nature of the project undertaken. Normally a minimum of two years is required to complete the program. MCoach candidates must complete all the requirements within six years of the term in which they first register.

The Master of Coaching degree is a course-based program which includes a practicum under the supervision of a mentor coach.

Program Requirements

Students enrolled in the MCoach degree program must complete as a minimum, the equivalent of 30 units. Students must successfully complete either [KSR 580](#) or [KSR 581](#) (each 3 units), [KSR 572](#) (6 units) and a capping exercise [KSR 900](#) (6 units). The capping exercise will be a significant piece of scholarly work in the field of coaching. Students are encouraged, but not required to select the remaining 15 units from the following list in consultation with the academic supervisor: [KSR 511](#), KIN 540, [KSR 541](#), [KSR 544](#), [KSR 575](#) or other relevant courses offered under the [KSR 582](#) designation. MCoach students may choose, as optional courses, relevant graduate courses offered by other Faculties. All optional courses must be approved by the academic supervisor.

There is no residency requirement for the MCoach degree program.

MCoach students are required to complete the **Ethics and Academic Citizenship Requirement (INT D 710)**, and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

Length of Program

The time required to complete the program will vary according to factors such as the previous training of the applicant, the availability of courses and the nature of the project undertaken. Normally a minimum of two years is required to complete the program. MCoach candidates must complete all the requirements within six years of the

Doctoral Programs

- [Doctor of Philosophy \(Kinesiology, Sport, and Recreation\)](#)
Doctor of Philosophy (Kinesiology, Sport, and Recreation)

Program Requirements

The PhD degree is a research degree; however, a number of specific courses may be required within the various areas of specialization. Please consult the staff within each specified area for further details. All courses must be approved by the Faculty of Kinesiology, Sport, and Recreation. Emphasis is on research leading to the dissertation rather than on coursework. All PhD students will complete [KSR 685](#) in the second year of their programs.

PhD students are required to complete the [ethics and academic integrity training requirement \(8 hours\)](#), and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

[The minimum period of residence is two academic years of full-time attendance at the University of Alberta.](#)

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of three years is required to complete the program. The maximum time permitted is six years from the date of the first registration.

term in which they first register.

Doctoral Programs

- [Doctor of Philosophy \(Kinesiology, Sport, and Recreation\)](#)
Doctor of Philosophy (Kinesiology, Sport, and Recreation)

Program Requirements

The PhD degree is a research degree; however, a number of specific courses may be required within the various areas of specialization. Please consult the staff within each specified area for further details. All courses must be approved by the Faculty of Kinesiology, Sport, and Recreation. Emphasis is on research leading to the dissertation rather than on coursework. All PhD students will complete [KSR 685](#) in the second year of their programs.

PhD students are required to complete the [Ethics and Academic Citizenship Requirement \(INT D 710 and INT D 720\)](#), and the professional development requirement (8 hours of professional development activities, and the Individual Development Plan).

[Although there is no formal residency requirement, some courses, research, teaching, funding, or supervisors may require an in-person presence on a University of Alberta campus or other related site.](#)

Length of Program

The time required to complete the program will vary according to the previous training of the applicant and the nature of the research undertaken. Normally a minimum of three years is required to complete the program. The maximum time permitted is six years from the date of the

Certificates

- [Graduate Certificate in Adapted Physical Activity](#)

Graduate Certificate in Adapted Physical Activity

The Graduate Certificate in Adapted Physical Activity is offered by the Faculty of Kinesiology, Sport, and Recreation. The focus of this certificate is using a disability-affirming approach to enhance skilled practice and reflexive learning. Focused on understanding disability within a larger context of equity, diversity, and inclusion (EDI), students in this graduate certificate program will advance critical thinking skills, reflect on taken for granted practices and assumptions, and explore practice oriented tools and knowledge. By fostering attitudes that are welcoming, affirming, and supporting, this **APA** Certificate is about reducing barriers, inhibitors, and constraints, and advocating access to active lifestyles and sport, by supporting facilitators and affordances that will promote innovative and cooperative service delivery, provide supports as needed, and empower individuals. The majority of course work will be delivered online; there will be an optional in-class component that will be held in partnership with the Steadward Centre for Personal & Physical Achievement.

Entrance Requirements

The Faculty's minimum admission requirements are an undergraduate degree with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution. The admission GPA will be calculated on the last 60 units of graded coursework completed, or on the equivalent of the last two years of full-time graded coursework.

The undergraduate degree can be in any discipline and some experience working in an adapted or recreation setting will be considered an asset.

A minimum 1 year of relevant work experience is also required. Note: relevant work experience includes but is not limited to individuals working in education, physical

first registration.

Certificates

- [Graduate Certificate in Adapted Physical Activity](#)

Graduate Certificate in Adapted Physical Activity

The Graduate Certificate in Adapted Physical Activity is offered by the Faculty of Kinesiology, Sport, and Recreation. The focus of this certificate is using a disability-affirming approach to enhance skilled practice and reflexive learning. Focused on understanding disability within a larger context of equity, diversity, and inclusion (EDI), students in this graduate certificate program will advance critical thinking skills, reflect on taken for granted practices and assumptions, and explore practice oriented tools and knowledge. By fostering attitudes that are welcoming, affirming, and supporting, this **Adapted Physical Activity** Certificate is about reducing barriers, inhibitors, and constraints, and advocating access to active lifestyles and sport, by supporting facilitators and affordances that will promote innovative and cooperative service delivery, provide supports as needed, and empower individuals. The majority of course work will be delivered online; there will be an optional in-class component that will be held in partnership with the Steadward Centre for Personal & Physical Achievement.

Entrance Requirements

The Faculty's minimum admission requirements are an undergraduate degree with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution. **A degree in Kinesiology or related field is considered an asset but not required.** The admission GPA will be calculated on the last 60 units of graded coursework completed, or on the equivalent of the last two years of full-time graded coursework.

The undergraduate degree can be in any discipline and some experience working in an adapted or recreation setting will be considered an asset.

education, allied health, sport, recreation, dance, fitness, creative arts, nutrition, medicine, rehabilitation (among other sectors).

Where applicable, applicants must meet the minimum [FGSR English Language Requirement](#).

Applicants are also required to submit the following:

- Current resume/curriculum vitae
- One professional letter of reference
- One letter of intent

Applicants who do not meet the minimum academic requirement but have considerable relevant professional experience may also be admissible. Individuals who feel that this situation applies to them are encouraged to contact the Manager, International and Community Education, Faculty of Kinesiology, Sport, and Recreation to discuss their status.

[...]

- [Graduate Certificate in Indigenous Sport and Recreation](#)

Graduate Certificate in Indigenous Sport and Recreation

The Certificate in Indigenous Sport and Recreation is a Graduate Certificate offered in partnership between the Faculty of Native Studies and the Faculty of Kinesiology, Sport, and Recreation. The **focus this** certificate is the health and well-being of Indigenous people through sport and recreation. The intended purpose is to serve a demonstrated need in the realm of community based Indigenous sport and recreation, establish a deep understanding of the cultural context of Indigenous communities and populations and to enhance leadership in the growing field of Indigenous sport and recreation. The program will be delivered in a blended format. Specifically, the curriculum will consist of three courses valued at four **credits** each (12 **credits** total), plus participation at a mandatory, one-week, in-class (i.e. face to face) experiential learning experience. This 10 month certificate is designed around a cohort model so students will work together in this innovative, blended program that can be completed with minimal travel and little disruption to their

A minimum 1 year of relevant work experience is also required. Note: relevant work experience includes but is not limited to individuals working in education, physical education, allied health, sport, recreation, dance, fitness, creative arts, nutrition, medicine, rehabilitation (among other sectors).

Where applicable, applicants must meet the minimum [FGSR English Language Requirement](#).

Applicants are also required to submit the following:

- Current resume/curriculum vitae
- One professional letter of reference
- One letter of intent

Applicants who do not meet the minimum academic requirement but have considerable relevant professional experience may also be admissible. Individuals who feel that this situation applies to them are encouraged to contact the Manager, International and Community Education, Faculty of Kinesiology, Sport, and Recreation to discuss their status.

[...]

- [Graduate Certificate in Indigenous Sport and Recreation](#)

Graduate Certificate in Indigenous Sport and Recreation

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work and family lives. The online portion of the program will use both synchronous and asynchronous teaching modalities to create interactive, dynamic, and supportive communities of learning whose members will become integral participants in this specific program researching Indigenous Peoples and Recreation best practices.

Entrance Requirements

The requirements for admission will include an undergraduate degree with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution. The admission GPA will be calculated on the last 60 units of graded coursework completed, or on the equivalent of the last two years of full-time graded coursework.

A minimum of two years of professional experience is also **required**.

Applicants who do not hold a baccalaureate degree but have considerable relevant professional experience may also be admissible. Individuals who feel that this situation applies to them are encouraged to contact admissions to discuss their status. There will be no other routes in which admission will be granted. There will be no opportunity for a residency.

[...]

- [Graduate Certificate in Sport and Recreation Management](#)

Graduate Certificate in Sport and Recreation Management

The Graduate Certificate in Sport and Recreation Management is offered by the Faculty of Kinesiology, Sport, and Recreation. The focus of this certificate is enhancing management and leadership skills in the fields of recreation, sport, and health programs, services, and facilities as well as increasing the organizational effectiveness of sport and recreational organizations or entities. The program is delivered 100% online. The online courses use both synchronous and asynchronous teaching modalities to create interactive, dynamic, and

is designed around a cohort model so students will work together in this innovative, blended program that can be completed with minimal travel and little disruption to their work and family lives. The online portion of the program will use both synchronous and asynchronous teaching modalities to create interactive, dynamic, and supportive communities of learning whose members will become integral participants in this specific program researching Indigenous Peoples and Recreation best practices.

Entrance Requirements

The requirements for admission will include an undergraduate degree with an admission GPA of at least 3.0 on the 4-point scale from the University of Alberta, or an equivalent qualification and standing from a recognized institution. The admission GPA will be calculated on the last 60 units of graded coursework completed, or on the equivalent of the last two years of full-time graded coursework.

A minimum of two years of professional experience is also **recommended**.

Applicants who do not hold a baccalaureate degree but have considerable relevant professional experience may also be admissible. Individuals who feel that this situation applies to them are encouraged to contact admissions to discuss their status. There will be no other routes in which admission will be granted. There will be no opportunity for a residency.

[...]

- [Graduate Certificate in Sport and Recreation Management](#)

Graduate Certificate in Sport and Recreation Management

The Graduate Certificate in Sport and Recreation Management is offered by the Faculty of Kinesiology, Sport, and Recreation. The focus of this certificate is enhancing management and leadership skills in the fields of recreation, sport, and health programs, services, and facilities as well as increasing the organizational effectiveness of sport and recreational organizations or

supportive communities of learning.

Laddering

Students who complete the certificate in good standing may be able to use the courses from the certificate to receive advanced standing in the course-based Master of Arts in the Faculty of Kinesiology, Sport, and Recreation. Completion of the certificate does not guarantee admission to a master degree program. The certificate may be used for both the basis of admission and advanced standing into the course-based master degree. Details can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.

Entrance Requirements

The requirements for admission will include a baccalaureate degree with a minimum AGPA of 3.0 along with a minimum of 1 year of professional work experience in a related area or field of work. Students are also required to submit a letter of intent, a curriculum vitae or resume and one professional reference.

Program Requirements

The curriculum will consist of four (4) courses valued at 3 units each for a total of 12 units.

Required Courses (12 units):

Choose four (4) courses from the following list:

- [KSR 711 - Organizational Analysis of Sport and Recreation](#)
- [KSR 712 - Sport and Recreation Organizations and the Public Sector](#)
- [KSR 713 - Financial Analysis and Management in Recreation and Sport Organizations](#)
- [KSR 714 - Marketing and Sponsorship in Sport and Recreation](#)
- [KSR 715 - Facilities and Event Management](#)
- [KSR 716 - Contemporary Issues in Sport and Recreation](#)

entities. The program is delivered 100% online. The online courses use both synchronous and asynchronous teaching modalities to create interactive, dynamic, and supportive communities of learning.

Laddering

Students who complete the certificate in good standing may be able to use the courses from the certificate to receive advanced standing in the course-based Master of Arts in the Faculty of Kinesiology, Sport, and Recreation. Completion of the certificate does not guarantee admission to a master degree program. The certificate may be used for both the basis of admission and advanced standing into the course-based master degree. Details can be found in the Calendar under Regulations of the Faculty of Graduate Studies and Research.

Entrance Requirements

The requirements for admission will include a baccalaureate degree with a minimum AGPA of 3.0 along with a minimum of 1 year of professional work experience in a related area or field of work. Students are also required to submit a letter of intent, a curriculum vitae or resume and one professional reference.

Program Requirements

The curriculum will consist of four (4) courses valued at 3 units each for a total of 12 units.

Required Courses (12 units):

Choose four (4) courses from the following list:

- [KSR 711 - Organizational Analysis of Sport and Recreation](#)
- [KSR 712 - Sport and Recreation Organizations and the Public Sector](#)
- [KSR 713 - Financial Analysis and Management in Recreation and Sport Organizations](#)
- [KSR 714 - Marketing and Sponsorship in Sport and Recreation](#)

<p>Length of Program</p> <hr/> <p>All components of the certificate must be completed with within 4 years from first registration for the certificate.</p> <hr/>	<ul style="list-style-type: none">· <u>KSR 715 - Facilities and Event Management</u>· <u>KSR 716 - Contemporary Issues in Sport and Recreation</u> <p>Length of Program</p> <hr/> <p>All components of the certificate must be completed within 4 years from first registration for the certificate.</p> <hr/>
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Reviewed/Approved by:

REQUIRED: KSR Faculty Council approval February 1, 2023

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

Faculty (& Department or Academic Unit):	Kinesiology, Sport, and Recreation (KSR)
Contact Person:	Normand Boule, PhD – Professor & Associate Dean, Graduate Jill Cameron, Manager, International & Community Education
Level of change: (choose one only) [?]	<ul style="list-style-type: none"> • Graduate
	<ul style="list-style-type: none"> • Calendar
For which term will this change take effect?	Fall 2024

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

Course outline and description updated to include more accurate description of content after development.
500 level for Graduate Students.

Course Template

Current: Removed language	Proposed: New language
<p>KSR 538</p> <p>Trauma Informed Practice (★3)</p> <p>Course Career Units Approved Hours = 3-0-0 Fee index: 6 Faculty: KSR Department: N/A Typically Offered: Either</p> <p>Description Linking trauma-informed pedagogy with strength-based instructional approaches promotes a safer and more relational instructional context – one that minimizes actions that may trigger or retraumatize learners. With the aim of acknowledging and supporting learner resilience, choice, control over one’s body and mind, and autonomy, course participants will learn the meaning and applications of trauma-informed pedagogy and practice, using instructional strategies typical of adapted physical activity as points for critical reflexion.</p>	<p>KSR 538</p> <p>Trauma Informed Practice (★3)</p> <p>Course Career Units Approved Hours =3-0-0 Fee index: 6 Faculty: KSR Department: N/A Typically Offered: Either</p> <p>Description This course will incorporate a diverse set of theories and approaches to cultivating relationships, activities, and environments that work to acknowledge trauma and minimize retraumatization. The focus will be on trauma-informed practice within adapted physical activity, therapeutic recreation, sport, and movement cultures more broadly. This course prioritizes critical disability studies, mad studies, and justice-oriented approaches to trauma-informed practice. Students will be supported to craft their own trauma-informed practice approach to pedagogy, coaching, research, sport, organizing, or other engagements with movement cultures.</p>

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Reviewed/Approved by:

REQUIRED: Graduate Programs Committee: January 12th, 2023 - Approved
KSR Faculty Council: February 1st, 2023 – Approved
FGSR Faculty Council:

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

Faculty (& Department or Academic Unit):	Kinesiology, Sport, and Recreation (KSR)
Contact Person:	Normand Boule, PhD – Professor & Associate Dean, Graduate Jill Cameron, Manager, International & Community Education
Level of change: (choose one only) [?]	<ul style="list-style-type: none"> • Graduate
	<ul style="list-style-type: none"> • Calendar
For which term will this change take effect?	Fall 2024

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

Course outline and description updated to include more accurate description of content after development.
700 level for Graduate Certificate students.

Course Template

Current: Removed language	Proposed: New language
<p>KSR 724</p> <p>Trauma Informed Practice (★3)</p> <p>Course Career Units Approved Hours = 3-0-0 Fee index: 6 Faculty: KSR Department: N/A Typically Offered: Either</p> <p>Description Linking trauma-informed pedagogy with strength-based instructional approaches promotes a safer and more relational instructional context – one that minimizes actions that may trigger or retraumatize learners. With the aim of acknowledging and supporting learner resilience, choice, control over one’s body and mind, and autonomy, course participants will learn the meaning and applications of trauma-informed pedagogy and practice, using instructional strategies typical of adapted physical activity as points for critical reflexion.</p>	<p>KSR 724</p> <p>Trauma Informed Practice (★3)</p> <p>Course Career Units Approved Hours =3-0-0 Fee index: 6 Faculty: KSR Department: N/A Typically Offered: Either</p> <p>Description This course will incorporate a diverse set of theories and approaches to cultivating relationships, activities, and environments that work to acknowledge trauma and minimize retraumatization. The focus will be on trauma-informed practice within adapted physical activity, therapeutic recreation, sport, and movement cultures more broadly. This course prioritizes critical disability studies, mad studies, and justice-oriented approaches to trauma-informed practice. Students will be supported to craft their own trauma-informed practice approach to pedagogy, coaching, research, sport, organizing, or other engagements with movement cultures.</p>

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Reviewed/Approved by:

REQUIRED: Graduate Programs Committee: January 12th, 2023 - Approved
KSR Faculty Council: February 1st, 2023 – Approved
FGSR Faculty Council:

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

Faculty (& Department or Academic Unit):	Rehabilitation Medicine, Occupational Therapy
Contact Person:	Amy Peters/Shaniff Esmail
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 2024
Does this proposal have corresponding course changes? (Should be submitted at the same time)	yes

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 changes below reflect the specific course calendar and credit changes.

The proposed calendar changes align our occupational therapy program with the latest Canadian Competencies for Occupational Therapists (2021) and our newly designed curriculum educational framework, "Education for Capabilities". These changes ensure our students receive an up-to-date, evidence-based education, preparing them to meet current and future demands in the field.

Calendar Copy

URL in current Calendar (or "New page") https://calendar.ualberta.ca/preview_program.php?catoid=39&pooid=47734&hl=%22occupational+therapy%22&returnto=search	
Current Copy: Removed language MSc course-based entry-level stream <hr/> Students are required to complete a total of 90 units in coursework, including 3 units of approved interprofessional coursework, field placements, and a 6 -unit final project. Orientation Program: The program requires that each student, after acceptance into the program, attend a department orientation program immediately before the beginning of the first term. Dates are confirmed on admission. Attendance at the orientation program is a prerequisite for first year courses. N ormally students must	Proposed Copy: New language Students beginning the program in 2024 are required to complete a total of 90 units in including approved coursework, fieldwork placements, 3 units of interprofessional coursework, and a 3-unit final capstone project. Orientation Program: The program requires that each student, after acceptance into the program, attend a department orientation program immediately before the beginning of the first term. Dates are confirmed on

<p>complete all previous term/year courses to be eligible to proceed to the subsequent term/year.</p> <p>It is imperative that registered students attend all listed hours of instruction. Students with absences will receive a grade of NC (failure, no grade point value assigned).</p>	<p>admission. Attendance at the orientation program is a prerequisite for first year courses.</p> <p>Progression through the program: Normally students must complete all previous term/year courses to be eligible to proceed to the subsequent term/year.</p>
<p>Student-selected Modules (3 units)</p> <p>All students must complete and pass either a minimum of three distinct OGCTH 543 modules or one 3-unit Individual Study (OCCTH 599 or equivalent). The modules are designed to be intensive and interactive.</p>	<p>Student-selected Modules (4 units)</p> <p>Students are required to complete a minimum of two OCCTH modules or their equivalent (eg. an Independent Study OCCTH 599 or another department-approved external equivalent course). In addition, they must complete two modules from among those specified by the department.</p>
<p align="center">Capping Exercise (6 units)</p> <hr/> <ul style="list-style-type: none"> ● OCCTH 906 – Directed Final Project Program Design and Evaluation 	<p align="center">Capping Project (3 units)</p> <hr/> <p>OCCTH 903 - Occupational Therapy Capstone Project</p>

Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date.</p>
<p>OPTIONAL:</p> <ul style="list-style-type: none"> ● Occupational Therapy Department Committee (June 7, 2023) ● Occupational Therapy Department Council (September 5, 2023) ● FRM Executive Committee (August 23, 2023) ● FRM Faculty Council (September 13, 2023)

Faculty (& Department or Academic Unit):	Rehabilitation Medicine/Occupational Therapy
Contact Person:	Amy Peters/Shaniff Esmail
Level of change: (choose one only) [?]	<input type="checkbox"/> Undergraduate
	<input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2024

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 proposed calendar changes align our occupational therapy program with the latest Canadian Competencies for Occupational Therapists (2021) and our newly designed curriculum educational framework, "Education for Capabilities". These changes ensure our students receive an up-to-date, evidence-based education, preparing them to meet current and future demands in the field.

Course Template

Current: Removed language	Proposed: New language
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<p>Subject & Number OCCTH 510</p> <p>Title Occupational Therapy Process and Practice: Application</p> <p>Course Career Graduate</p> <p>Units 2</p> <p>Approved Hours 0-2S-0</p> <p>Fee index 4</p> <p>Faculty Rehabilitation Medicine</p> <p>Department Occupational Therapy</p> <p>Typically Offered either term</p> <p>Description Application of occupational therapy principles and skills, supported by evidence-based practice, in physical and mental health, functioning, participation and activities.</p>	<p>Subject & Number OCCTH 510</p> <p>Title Occupational Therapy Process and Practice: Application</p> <p>Course Career Graduate</p> <p>Units 2</p> <p>Approved Hours 0-2S-0</p> <p>Fee index</p> <p>Faculty Rehabilitation Medicine</p> <p>Department Occupational Therapy</p> <p>Typically Offered either term</p> <p>Description Apply the occupational therapy process using practice reasoning in clinical scenarios. Demonstrate collaborative relationship building.</p>
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<p>Subject & Number OCCTH 517</p> <p>Title Foundations of Psychiatry and Mental Health Practice for Occupational Therapists</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Foundational knowledge of the description, mechanism and classification of psychiatric phenomenon required for the provision of client centered, evidence-informed occupational therapy with persons experiencing chronic and acute mental illness.</p>	<p>Subject & Number OCCTH 517</p> <p>Title Mental Health and Psychosocial Foundations in Occupational Therapy</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students explore foundational knowledge of mental health and psychosocial considerations related to evidence-informed occupational therapy. This course emphasizes competencies involved in contextually sensitive case formulation.</p>
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<p>Subject & Number OCCTH 583</p> <p>Title Influences on Occupational Performance: Human Systems I: Structure, Function and Conditions</p> <p>Course Career Graduate Units 4 Approved Hours 4-0-1 Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description The study of: (a) physical human systems, nervous system and occupational performance deficits resulting from illness, injury, and disease; and (b) the concurrent development of related assessment skills and occupational therapy interventions.</p>	<p>Subject & Number OCCTH 583</p> <p>Title Foundations of Physical Health in Occupational Participation</p> <p>Course Career Graduate Units 4 Approved Hours 4-0-2 Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description This course provides an in-depth study of physical health systems, including the nervous system, and how illness, injury, and disease in interaction with social and environmental contexts influence occupational participation. Students will simultaneously build capabilities in occupational therapy assessment and intervention.</p>
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Reviewed/Approved by:

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

OPTIONAL:

- Occupational Therapy Department Committee (June 7, 2023)
- Occupational Therapy Department Council (September 5, 2023)
- FRM Executive Committee (August 23, 2023)
- FRM Faculty Council (September 14, 2023)

Faculty (& Department or Academic Unit):	Occupational Therapy, Rehabilitation Medicine
Contact Person:	Amy Peters/Shaniff Esmail
Level of change: (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2024

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 proposed calendar changes align our occupational therapy program with the latest Canadian Competencies for Occupational Therapists (2021) and our newly designed curriculum educational framework, "Education for Capabilities". These changes ensure our students receive an up-to-date, evidence-based education, preparing them to meet current and future demands in the field.

Course Template

Current: Removed language	Proposed: New language
	<p>Subject & Number OCCTH 504</p> <p>Title Foundations of Occupation-Focused Practice, Professionalism and Practice Process: I</p> <p>Course Career Graduate</p> <p>Units 4</p> <p>Approved Hours 4-0-0</p> <p>Fee index 8</p> <p>Faculty Rehabilitation Medicine</p> <p>Department Occupational Therapy</p> <p>Typically Offered either term</p> <p>Description Introduction to professionalism, collaborative approaches, theoretical practice models and frameworks in the OT context. Exploration of communication and therapeutic relationships. Initiation of clinical reasoning in the analysis of occupational participation. Students complete a one-week introductory fieldwork placement.</p>

Subject & Number OCCTH 505

Title Foundations of Occupation-Focused Practice, Professionalism and Practice Process: II

Course Career Graduate

Units 2

Approved Hours 2-0-0

Fee index 4

Faculty Rehabilitation Medicine

Department Occupational Therapy

Typically Offered either term

Description

Understand professional responsibilities, ethical approaches, regulation and supervision. Application and evaluation of practice processes and clinical reasoning in the analysis of occupational participation.

Subject & Number OCCTH 506

Title Introduction to Human Occupation

Course Career Graduate

Units 3

Approved Hours 3-0-0

Fee index 6

Faculty Rehabilitation Medicine

Department Occupational Therapy

Typically Offered either term

Description

Students are introduced to philosophical and scientific foundations of human occupation. Through the application of theory and analysis of occupations, students will understand the dynamic relationship between people, contexts, and the occupations. Exploring the relationship between occupation and health and well-being, this course offers principles for occupational therapy practice.

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Reviewed/Approved by:

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

OPTIONAL:

- Occupational Therapy Department Committee (June 7, 2023)
- Occupational Therapy Department Council (September 5, 2023)
- FRM Executive Committee (August 23, 2023)
- FRM Faculty Council (September 14, 2023)

Faculty (& Department or Academic Unit):	Rehabilitation Medicine/Occupational Therapy
Contact Person:	Amy Peters/Shaniff Esmail
Level of change: (choose one only) [?]	<input type="checkbox"/> Undergraduate
	<input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2024

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 proposed calendar changes align our occupational therapy program with the latest Canadian Competencies for Occupational Therapists (2021) and our newly designed curriculum educational framework, "Education for Capabilities". These changes ensure our students receive an up-to-date, evidence-based education, preparing them to meet current and future demands in the field.

Course Template

Current: Removed language	Proposed: New language
<p>Subject & Number OCCTH 518</p> <p>Title Assessment Interventions for Occupational Therapists in Mental Health Practice</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Occupational therapy theories, assessments, and intervention techniques aimed at mental health promotion, illness/injury prevention and facilitation of recovery and occupational performance across the lifespan and settings.</p>	<p>Subject & Number OCCTH 518</p> <p>Title Approaches to mental health assessment and intervention in Occupational Therapy</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students examine occupational therapy theories, modes of inquiry, and psychosocial interventions aimed at mental health promotion and facilitation of recovery and occupational participation across the lifespan.</p>

<p>Subject & Number OCCTH 522</p> <p>Title Enabling Occupation Through the Use of Assistive Technology</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-4 Fee index Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Theory and practice skills to ensure the correct interface between clients' needs, assistive technology, occupation, and context.</p>	<p>Subject & Number OCCTH 522</p> <p>Title Technology and Occupation</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-2 Fee index Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students use evidence-informed and inquiry-driven methods to analyze how technology impacts occupational performance, well-being, and functioning. Students will enhance their theoretical knowledge and practical skills of assistive, environmental and advanced technologies used in professional practice. Additionally, students will critically examine the ethics, inequities and barriers to access to technology</p>
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<p>Subject & Number OCCTH 530</p> <p>Title Occupational Therapy Process and Practice: Synthesis</p> <p>Course Career Graduate Units 2 Approved Hours 0-2S-0 Fee index 4 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description The use and design of interventions for physical and mental health, functioning, participation, and activities supported by the analysis and synthesis of occupational therapy principles.</p>	<p>Subject & Number OCCTH 530</p> <p>Title Occupational Therapy Process and Practice: Synthesis</p> <p>Course Career Graduate Units 2 Approved Hours 0-2S-0 Fee index 4 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Integrate and synthesize the occupational therapy practice process in a family-centred context. Demonstrate practice reasoning within micro, meso and macro level contexts to support occupational participation.</p>
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<p>Subject & Number OCCTH 555</p> <p>Title Enabling Occupation and Participation for Children and Youth</p> <p>Course Career Graduate Units 3 Approved Hours 3-0-1 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Application of occupational therapy principles with an emphasis on children, youth, and families; supported by evidence-based practice, and the incorporation of current theories, complex integrated case studies, and experiential learning.</p>	<p>Subject & Number OCCTH 555</p> <p>Title Occupation Across the Lifespan: Children</p> <p>Course Career Graduate Units 4 Approved Hours 4-0-1 Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students explore occupational participation for children and how it is influenced by developmental trajectories, life events and opportunities, family contexts, and broader environments. The occupational therapist's role in supporting children, families and communities is explored through family-centered and strengths-based perspectives.</p>
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<p>Subject & Number OCCTH 584</p> <p>Title Influences on Occupational Performance: Human Systems II: Conditions and Interventions</p> <p>Course Career Graduate Units 4 Approved Hours 4-0-4 Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Occupational performance deficits resulting from illness, injury, and disease and the application of related assessment skills and occupational therapy interventions.</p>	<p>Subject & Number OCCTH 584</p> <p>Title Physical Health Interventions for Occupational Participation</p> <p>Course Career Graduate Units 4 Approved Hours 4-0-2 Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Provides a comprehensive examination of various clinical conditions that impact occupational capability. Students will learn and apply evidence-informed occupational therapy assessments and interventions in practical, real-world scenarios. The course explores the interplay between individuals, their health, and the environment, promoting a comprehensive view of</p>
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	health and wellbeing and addressing occupational participation.
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<p>Subject & Number OCCTH 543</p> <p>Title Student Selected Modules</p> <p>Course Career Graduate Units 1 Approved Hours 13 hours Fee index 2 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students must successfully complete either a minimum of three distinct OCCTH modules or equivalent, which may include Independent study OCCTH 599 or an equivalent course as determined by the department. Note: Course title is variable; course may be repeated.</p>	<p>Subject & Number OCCTH 543</p> <p>Title Student Selected Module</p> <p>Course Career Graduate Units 1 Approved Hours 13 hours Fee index 2 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students are required to complete a minimum of two OCCTH modules or their equivalent (eg. an Independent Study OCCTH 599 or another department-approved external equivalent course). In addition, they must complete two modules from among those specified by the department. Note: Course title is variable; course may be repeated.</p>
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Reviewed/Approved by:

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

- OPTIONAL:
- Occupational Therapy Department Committee (June 7, 2023)
 - Occupational Therapy Department Council (September 5, 2023)
 - FRM Executive Committee (August 23, 2023)
 - FRM Faculty Council (September 14, 2023)

Faculty (& Department or Academic Unit):	Rehabilitation Medicine/Occupational Therapy
Contact Person:	Amy Peters/Shaniff Esmail
Level of change: (choose one only) [?]	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Graduate
For which term will this change take effect?	Fall 2024

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 proposed calendar changes align our occupational therapy program with the latest Canadian Competencies for Occupational Therapists (2021) and our newly designed curriculum educational framework, "Education for Capabilities". These changes ensure our students receive an up-to-date, evidence-based education, preparing them to meet current and future demands in the field.

Course Template

Current: Removed language	Proposed: New language
Subject & Number OCCTH 507 Title Occupation and Society: Theory and Practice Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term Description Theories and philosophies underpinning occupational therapy and occupational science.	Subject & Number OCCTH 507 Title Structural Inequality and Human Occupation Course Career Graduate Units 3 Approved Hours 3-0-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term Description Students will critically analyze structural inequality and human occupation. Students will explore occupational therapy as a political practice that has the potential to reproduce and mitigate oppressive social relations that shape the occupations of everyday life. Students will explore how intersectional oppressions (and related social issues) influence/shape human occupation; question underlying social norms, assumptions and values; and develop practices that affirm human diversity.

<p>Subject & Number OCCTH 520</p> <p>Title Occupational Therapy Process and Practice: Integration</p> <p>Course Career Graduate Units 2 Approved Hours 0-2S-0 Fee index 4 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Case based clinical reasoning to integrate occupational therapy theory and values in the selection of intervention media and modalities, for physical and mental health functioning, participation, and activities.</p>	<p>Subject & Number OCCTH 520</p> <p>Title Occupational Therapy Process and Practice: Integration</p> <p>Course Career Graduate Units 2 Approved Hours 0-2S-0 Fee index 4 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Apply and integrate the occupational therapy practice process in complex case-based scenarios. Demonstrate practice reasoning in the context of assessment and intervention planning to support occupational participation.</p>
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<p>Subject & Number OCCTH 566</p> <p>Title Research and Scholarly Practice 4</p> <p>Course Career Graduate Units 2 Approved Hours 4-1S-0 Fee index 4 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description The theory-research-practice nexus; skills for inquiry based learning and evidence based practice; acquiring, interpreting and applying best evidence for safe, ethical and effective occupational therapy practice.</p>	<p>Subject & Number OCCTH 566</p> <p>Title Research and Scholarly Practice</p> <p>Course Career Graduate Units 3 Approved Hours 2-1S-0 Fee index 6 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Students will explore the connection between theory, research, and practice, advancing their knowledge of a variety of research approaches. They also develop capabilities in critically evaluating and applying evidence to inform decision-making.</p>
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<p>Subject & Number OCCTH 525</p> <p>Title Fieldwork-Learning in a Practice Context</p> <p>Course Career Graduate Units 4 Approved Hours Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Practical experience in approved facilities and community agencies to apply and integrate the core knowledge and skills of occupational therapy.</p>	<p>Subject & Number OCCTH 525</p> <p>Title Fieldwork-Learning in a Practice Context</p> <p>Course Career Graduate Units 4 Approved Hours Fee index 8 Faculty Rehabilitation Medicine Department Occupational Therapy Typically Offered either term</p> <p>Description Practical experience providing service within diverse practice contexts to promote occupational participation through the application and integration of the core knowledge and skills of occupational therapy. Level 1/Novice.</p>
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Reviewed/Approved by:

<p>REQUIRED: Faculty Council (or delegate) and approval date.</p>
<p>OPTIONAL:</p> <ul style="list-style-type: none"> - Occupational Therapy Department Committee (June 7, 2023) - Occupational Therapy Department Council (September 5, 2023) - FRM Executive Committee (August 23, 2023) - FRM Faculty Council (September 14, 2023)



Decision Discussion Information

ITEM OBJECTIVE:

The proposal is before the committee to introduce a new course designator, DA, as an identifier for courses related to the Certificate in Dental Assisting program.

DATE	October 12, 2023
TO	Provost and Vice-President (Academic)
RESPONSIBLE PORTFOLIO	Brenda Hemmelgarn, Dean, Faculty of Medicine and Dentistry Paul Major, Chair, School of Dentistry, Faculty of Medicine and Dentistry Steven Patterson, Associate Chair, Academic, School of Dentistry, Faculty of Medicine and Dentistry

MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, a new course designator (DA) for the new Dental Assisting Certificate and courses set forth in attachment 1, as submitted by the Faculty of Medicine and Dentistry's School of Dentistry.

EXECUTIVE SUMMARY:

Background

The School of Dentistry received approval from the GFC Academic Planning Committee (May 18, 2022) to implement a new Certificate in Dental Assisting. Since that time, the School sought and received approval for this new certificate program from the National Dental Assisting Examining Board (January 18, 2023), the Ministry of Advanced Education (April 27, 2023) and the College of Alberta Dental Assistants (August 25, 2023).

At the time of the initial proposal being reviewed and approved at the Faculty and Governance levels, a course designator for the proposed Certificate courses had not yet been confirmed. This proposal seeks approval for the new course designator of DA, to identify courses related to the Certificate in Dental Assisting program, as shown in Attachment 1.

An accompanying proposal item includes new calendar language for the Certificate in Dental Assisting program and regulation information.

Supporting Materials:

Attachments

1. Calendar Change Request form for Course Changes (Dental Assisting)

SCHEDULE A:

GOVERNANCE OUTLINE

Engagement and Routing

Consultation and Stakeholder Participation / Approval Route (parties who have seen the proposal and in what capacity) <[Governance Resources Section Student Participation Protocol](#)>

Those who are actively participating:

- Senior Associate Dean, Dental Affairs and Chair, Department of Dentistry, Faculty of Medicine and Dentistry
- Associate Chair (Academic), School of Dentistry, Faculty of Medicine and Dentistry
- Director, Dental Assisting, School of Dentistry, Faculty of Medicine and Dentistry
- Manager, Curriculum & Programs, School of Dentistry, Faculty of Medicine and Dentistry
- Curriculum Delivery & Instructional Support Coordinator, School of Dentistry, Faculty of Medicine and Dentistry

Those who have been consulted:

- Faculty Council, Faculty of Medicine and Dentistry (March 15, 2022) Motion carried: Faculty Council supports the creation of a new Dental Assisting Certificate
- University of Alberta, Program Support Team - February 24, 2022 for discussion
- Faculty of Medicine and Dentistry, Indigenous Health Initiatives Program, February 11, 2022
- Office of the Registrar, Indigenous Recruitment - January 31, 2022
- School of Dentistry Department Council - January 27, 2022
- Faculty Learning Committee - FoMD - January 25, 2022
- Alberta Dental Association & College - August 16, 2021
- Provost and Vice-President (Academic)

Those who have been informed:

- Psychometric Strategies and Research, Inc. - September 13, 2021
- Commission on Dental Accreditation of Canada - August 30, 2021
- National Dental Assisting Examination Board - August 20, 2021
- Ministry of Advanced Education - August 9, 2021
- University of Saskatchewan College of Dentistry - July 12, 2021
- College of Alberta Dental Assistants - July 12, 2021, August 19, 2021

Approval Route:

- GFC Programs Committee - April 14, 2022
- Registrar's Advisory Committee on Program Budget and Fees - April 26, 2022
- GFC Academic Planning Committee - May 4, 2022
- Board Finance and Property Committee - May 31, 2022
- Board of Governors - June 17, 2022

Supplementary Notes / Context:

Additional Required Approval from Regulatory Bodies & Provincial Ministries for Dental Assisting Certificate Program:



National Dental Assisting Examining Board - January 18, 2023
Ministry of Advanced Education - April 27, 2023
College of Alberta Dental Assistants (includes consultation with the Minister of Health) - August
25, 2023

Faculty (& Department or Academic Unit):	Faculty of Medicine & Dentistry, Dental Assisting Program
Contact Person:	Meghan Rannells rannells@ualberta.ca Carla Clarke cclarke1@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?	Winter 2024

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

Course descriptors moved through GFC Programs Committee (April 14, 2022) alongside the recommendation to GFC Academic Planning Committee (APC) to approve the new program proposal for implementation, which was approved as of May 18, 2022, but a designator had not yet been determined at that time. After receiving Governance approval, course names changes have been approved, and must be reflected in the UA Calendar appropriately.

Course Template

Current: Removed language	Proposed: New language
Subject & Number Title Course Career Units Approved Hours Fee index Faculty Department Typically Offered Description	DA 101 Foundations of Dental Assisting Course Career Undergraduate Units 6 Approved Hours 6 WEEKS Fee index 12 Faculty Medicine and Dentistry Department Dentistry Typically Offered variable Description Foundations of Dental Assisting is the first course in a sequential structure of learning that introduces students to the dental profession and their role as a Dental Assistant. Foundational knowledge and skills will be developed in behavioral sciences, biomedical sciences, oral health sciences and dental assisting theory and practice streams. Students will be able to integrate learning from all four streams and understand the relevance of foundational learning to dental assisting. Students will be introduced to the Simulation Lab, Oral Health Clinic and have opportunities to apply their knowledge in both settings. Prerequisite: Consent of the Department. DA 102

Patient Assessment I

Course Career Undergraduate

Units 7

Approved Hours 9 WEEKS

Fee index 14

Faculty Medicine and Dentistry

Department Dentistry

Typically Offered variable

Description

Patient Assessment I is the second course in a sequential structure of learning. This course educates students on patient assessments, findings and related procedures. Students will be able to integrate learning from all four streams of foundational learning to dental assisting. Students will be able to apply their knowledge in various lab and pre-clinical settings to build on their foundational learning.

Prerequisites: DA 101 Foundations in Dental Assisting and Consent of the Department.

DA 103

Patient Assessment II

Course Career Undergraduate

Units 7

Approved Hours 10 WEEKS

Fee index 14

Faculty Medicine and Dentistry

Department Dentistry

Typically Offered variable

Description

Patient Assessment II is the third course in the sequential structure of learning. This course continues to build on the foundational knowledge of course 2 with the emphasis on patient care and clinical procedures.

Students will be able to integrate learning from all four streams and apply foundational concepts to dental assisting. Students will be able to apply their knowledge in a combination of lab, pre-clinical and clinical settings to build on their foundational learning.

Prerequisites: DA 102 Patient Assessment I and Consent of the Department.

DA 104

Clinical Practice I

Course Career Undergraduate

Units 7
Approved Hours 10 WEEKS
Fee index 14
Faculty Medicine and Dentistry
Department Dentistry
Typically Offered variable

Description
 Clinical Practice I is the fourth course in the sequential courses of the Dental Assisting Program, the emphasis of this course is for the students to continue to build on integrating all four streams and have a greater understanding of the relevance of foundational learning through the ability to assess, plan, implement and evaluate dental assisting procedures and patient care procedures. Students will continue to apply foundational knowledge through actively participating in assisting within the Oral Health clinic with fellow students and patients and perform their skills on peers in a clinical setting.
 Prerequisites: DA 103 Patient Assessment II and Consent of the Department.

DA 105
Clinical Practice II
Course Career Undergraduate
Units 6
Approved Hours 8 WEEKS
Fee index 12
Faculty Medicine and Dentistry
Department Dentistry
Typically Offered variable

Description
 This is the final course in the sequential courses of the Dental Assisting Program, the emphasis of this course is for students to apply behavioral, biomedical, oral health sciences and dental assisting theory and practice into clinical practice. Students will apply their knowledge in office administration, assisting with patients in the Oral Health Clinic, treating patients in the Dental Assisting Patient Care Clinic and participating in an external practicum in a private dental practice.
 Prerequisites: DA 104 Clinical Practice I and Consent of the Department.

Reviewed/Approved by:

FoMD Faculty Learning Committee (Faculty Council-delegated Approver) – April 8, 2022

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



Decision Discussion Information

ITEM OBJECTIVE:

The proposal is before the committee to request approval of the proposed program and regulation calendar language for the Certificate in Dental Assisting in the Faculty of Medicine & Dentistry.

DATE	October 12, 2023
TO	Provost and Vice-President (Academic)
RESPONSIBLE PORTFOLIO	Brenda Hemmelgarn, Dean, Faculty of Medicine and Dentistry Paul Major, Chair, School of Dentistry, Faculty of Medicine and Dentistry Steven Patterson, Associate Chair, Academic, School of Dentistry, Faculty of Medicine and Dentistry

MOTION:

THAT the GFC Programs Committee approve, with delegated authority from General Faculties Council, the proposed program and regulation calendar language for the Certificate in Dental Assisting, as presented by the Faculty of Medicine and Dentistry, for implementation in Winter 2024.

EXECUTIVE SUMMARY:

The School of Dentistry received approval from the GFC Academic Planning Committee on May 18, 2022 to implement a new Certificate in Dental Assisting. Since that time, the School also sought and received approval for this new certificate program from the National Dental Assisting Examining Board (January 18, 2023), the Ministry of Advanced Education (April 27, 2023) and the College of Alberta Dental Assistants (August 25, 2023).

Draft calendar language was included during the initial proposal that was reviewed at GFC Programs Committee in April 2022, and the attached program and regulation language is being submitted for approval and implementation in the 2024-2025 University Calendar.

Background

The Certificate program is anticipated to fulfill a clear need in the current labour market in Alberta for Dental Assistants by a Dental Assisting program with unique learning opportunities that will benefit the School of Dentistry's current dental students and the overall delivery of patient care in our student clinics.

The graduates of this certificate will have completed 5 sequential courses, over a 10-month timeframe for a total of 32 credits. The curriculum for this certificate will be delivered in a way that presents the material in a progression of sequential foundational knowledge and skills to work in a clinical environment. The curriculum will be aligned with the National Dental Assisting

GOVERNANCE OUTLINE



Examining Board as part of the initial program approval process and must be approved by the College of Dental Assistants of Alberta.

Students who are admitted to the Dental Assisting Certificate program will be required to meet all of the program completion requirements in order to graduate including both workplace learning placements. The learning opportunities students will have access to at the School of Dentistry at the University of Alberta will be unique and like no other in Alberta.

The Dental Assisting Certificate program will be funded through student tuition with no government funding or external funding. Tuition for the Certificate was approved by the University of Alberta Board of Governors on June 17, 2022.

Supporting Materials:

Attachments

1. Calendar Change Request form for Program Changes - Certificate in Dental Assisting

SCHEDULE A:

Engagement and Routing

Consultation and Stakeholder Participation / Approval Route (parties who have seen the proposal and in what capacity) <[Governance Resources Section Student Participation Protocol](#)>

Those who are actively participating:

- Senior Associate Dean, Dental Affairs and Chair, Department of Dentistry, Faculty of Medicine and Dentistry
- Associate Chair (Academic), School of Dentistry, Faculty of Medicine and Dentistry
- Director, Dental Assisting, School of Dentistry, Faculty of Medicine and Dentistry
- Manager, Curriculum & Programs, School of Dentistry, Faculty of Medicine and Dentistry
- Curriculum Delivery & Instructional Support Coordinator, School of Dentistry, Faculty of Medicine and Dentistry

Those who have been consulted:

- Faculty Council, Faculty of Medicine and Dentistry (March 15, 2022) Motion carried: Faculty Council supports the creation of a new Dental Assisting Certificate
- University of Alberta, Program Support Team - February 24, 2022 for discussion
- Faculty of Medicine and Dentistry, Indigenous Health Initiatives Program, February 11, 2022
- Office of the Registrar, Indigenous Recruitment - January 31, 2022
- School of Dentistry Department Council - January 27, 2022
- Faculty Learning Committee - FoMD - January 25, 2022
- Alberta Dental Association & College - August 16, 2021
- Provost and Vice-President (Academic)



Those who have been **informed**:

- Psychometric Strategies and Research, Inc. - September 13, 2021
- Commission on Dental Accreditation of Canada - August 30, 2021
- National Dental Assisting Examination Board - August 20, 2021
- Ministry of Advanced Education - August 9, 2021
- University of Saskatchewan College of Dentistry - July 12, 2021
- College of Alberta Dental Assistants - July 12, 2021, August 19, 2021

Approval Route:

- GFC Programs Committee - April 14, 2022
- Registrar's Advisory Committee on Program Budget and Fees - April 26, 2022
- GFC Academic Planning Committee - May 4, 2022
- Board Finance and Property Committee - May 31, 2022
- Board of Governors - June 17, 2022

Supplementary Notes / Context:

Additional Required Approval from Regulatory Bodies & Provincial Ministries for Dental Assisting Certificate Program:

National Dental Assisting Examining Board - January 18, 2023

Ministry of Advanced Education - April 27, 2023

College of Alberta Dental Assistants (includes consultation with the Minister of Health) - August 25, 2023

Faculty (& Department or Academic Unit):	Faculty of Medicine & Dentistry, Dental Assisting Program
Contact Person:	Meghan Rannells rannells@ualberta.ca Carla Clarke cclarke1@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?	Winter 2024
Does this proposal have corresponding course changes? (Should be submitted at the same time)	Calendar Change Request Form for Course Changes (Dental Assisting)

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 School of Dentistry received approval from the GFC Academic Planning Committee on May 18, 2022 to implement a new Certificate in Dental Assisting. Since that time, the School also sought and received curriculum approval for exam eligibility for the certificate program from the National Dental Assisting Examining Board (January 18, 2023), and approval from the Ministry of Advanced Education (April 27, 2023) and the College of Alberta Dental Assistants (August 25, 2023).

Draft calendar language was included during the initial proposal being reviewed at GFC Programs Committee in April 2022, and the below updated and additional program and regulation language is being submitted for approval and implementation for Winter 2024, with the first cohort planned to begin in April 2024.

Since the Program Approval, the First Aid Requirement prior to enrollment was removed as it was deemed appropriate for the Program to supply the booking means and schedule time for students to complete during their time in the Program. Additions around High School and Transfer Applicants to better align with the pool of applicants who are anticipated to apply for the DA Certificate Program.

Students in the Certificate in Dental Assisting Program will not be assessed through the same academic standing process utilized for the other undergraduate professional programs in FoMD, and therefore a clarification is proposed for that section of the Calendar.

Calendar Copy

Undergraduate Programs>Faculty of Medicine & Dentistry>Certificate in Dental Assisting
https://ualberta.acalogadmin.com/preview/preview_program.php?catoid=44&poid=62773&returnto=13672

Current Copy: ~~Removed language~~

Proposed Copy: New language

Certificate in Dental Assisting

General Information

The Department of Dentistry offers a 10-month program leading to the Certificate in Dental Assisting. The curriculum for this certificate program is presented in a sequential progressive format, building on foundational knowledge and skills, and including learning in simulation and clinical environments.

Orientation

It is mandatory that each student, after acceptance into the program, attend Orientation. This is scheduled immediately before the beginning of the first term of each year.

Program Requirements (10 Months, 32 units)

Practicum Requirements

Certificate in Dental Assisting

General Information

Curriculum

The School of Dentistry offers a 10-month program leading to the Certificate in Dental Assisting. The curriculum for this certificate program is presented in a sequential progressive format, building on foundational knowledge and skills, and including learning in simulation and clinical environments.

Technical Standards

All students considering application to the Dental Assisting Certificate program should review the School of Dentistry Technical Standards Policy. This policy defines the necessary knowledge, skills, professional behaviors, and attitudes expected of students to demonstrate competency and to demonstrate successful completion of the program.

Library

The new Geoffrey and Robyn Sperber Health Sciences Library contains a comprehensive selection of reference materials and textbooks on dentistry and related subjects. In addition, it contains most current dental journals in English and other languages, and the Index to Dental Periodical Literature, an index to all dental periodicals since 1839. The Sperber library offers a wide range of services, including an Indigenous learning space, Teaching and Learning Lab, a Maker Lab with 3D printing available, a VR Lab, bookable spaces for studying, and more.

Orientation

It is mandatory that each student, after acceptance into the program, attend all identified orientation sessions indicated in the student schedule. Orientation is scheduled at the beginning of the program.

Program Requirements (10 Months, 32 units):

- DA 101 - Foundations of Dental Assisting
- DA 102 - Patient Assessment I
- DA 103 - Patient Assessment II
- DA 104 - Clinical Practice I
- DA 105 - Clinical Practice II

<p>The Dental Assisting program will include an internal practicum rotation within the School of Dentistry Oral Health Clinic and one external practicum.</p> <ol style="list-style-type: none"> The Internal Practicum rotation will begin early on in the program and will continue sequentially building on foundational knowledge as students' skill set increases throughout the program. The Dental Assisting students will be integrated into assisting DDS students in the School of Dentistry Oral Health Clinic—time allocation will increase to approximately 6-9 hours per week as students progress in the program. Approx. 90—135 hours of Internal Clinical experience in various Undergraduate and Graduate clinics (subject to level of skill at the time). There will be one 2 week off-site practicum in a Private Dental Practice, or Community Practice for each student — minimum of 70 hours (7 hours a day). <p>Program Completion Requirements</p> <ol style="list-style-type: none"> Complete all of the required program courses with the minimum passing grade outlined in each course syllabus. Successfully complete all assessments and mandatory clinical hours as per each course syllabus. Complete the required Practicum hours and submit Practicum Log and Evaluation. 	<p>Notes: Clinical Rotations and Practicum Requirements: The Dental Assisting program will include internal clinical rotations and an external practicum rotation.</p> <ol style="list-style-type: none"> The Internal Clinical rotations will begin in course DA 103, and continue throughout courses DA 104 and DA 105, sequentially building on foundational knowledge as students' skill set increases in each course. The internal clinical rotations integrate Dental Assisting students into the School of Dentistry's Oral Health Clinic, including assisting Dentistry (DDS) students in the School of Dentistry. The Dental Assisting students are required to meet the internal clinical hour requirements of each course in order to progress onto the next course. Each student will complete one 2-week off-site practicum in a Private Dental Practice, or Community Dental Practice - minimum of 70 hours (7 hours a day). <p>Program Completion Requirements</p> <ol style="list-style-type: none"> Complete all of the required program courses with the minimum passing grade outlined in each course syllabus. Successfully complete all assessments and mandatory clinical hours as per each course syllabus. Complete the required Practicum hours and submit Practicum Log and Evaluation.
<p>Undergraduate Admissions > Faculty Specific Admission Requirements > Faculty of Medicine and Dentistry Admission Requirements > Certificate in Dental Assisting</p>	
<p>Certificate in Dental Assisting Application for Admission and Application for Readmission</p> <p>Only electronic applications will be accepted. To access the online application for the University of Alberta go to www.admissions.ualberta.ca.</p> <p>For detailed application and program information please visit www.dentistry.ualberta.ca.</p> <p>Enrolment: Enrolment for the Dental Assisting Certificate Program has two enrolment cycles per year, in August and April. Each enrolment is limited to an annual quota of 26 students.</p>	<p>Certificate in Dental Assisting Application for Admission and Application for Readmission</p> <p>Only electronic applications will be accepted. To access the online application for the University of Alberta go to www.admissions.ualberta.ca.</p> <p>For detailed application and program information please visit www.dentistry.ualberta.ca.</p> <p>Enrolment: On an annual basis, there are two enrolment cycles for the Dental Assisting Certificate Program: April, and August. Each enrolment has a quota of 26 students per cycle.</p> <p>Admission to the Certificate in Dental Assisting is competitive. The number of high school and transfer admissions or readmissions to the certificate is limited to the quota. Presentation of the minimum requirements does</p>

Indigenous Applicants:

The ~~School of~~ Dentistry is committed to the recruitment, retention and graduation of Indigenous students. All Indigenous applicants who meet the ~~Indigenous application~~ requirements and are successful in the admissions process will be ~~admitted to the Dental Assisting Program.~~

- ~~Applicants who are of Indigenous ancestry within the meaning of The Constitution Act, 1982, Section 35(2), or~~
- ~~A person who is accepted by one of the Indigenous Peoples of Canada as a member of their community.~~

~~Proof of ancestry must be provided when applying as an Indigenous student. Accepted forms of documentation are outlined in the [Admission of Indigenous Applicants](#) section of the University of Alberta Calendar.~~

~~Candidates will be subject to standard minimum admission requirements as will be outlined in the Calendar and approval by the Dentistry Admissions Committee.~~

Eligibility Criteria for Admission

Academic Requirements: The minimum requirement for admission to the Dental Assisting Certificate Program is:

1. Minimum of 65% in each of:
 - a. English Language Arts 30-1 or English Language Arts 30-2
 - b. Chemistry 30
 - c. Biology 30
 - d. One of the following: Math 30-1, Math 30-2, Pure Math 30 or Applied Math 30

~~Applicants who meet these eligibility criteria will be required to complete additional admission requirements ([Admission Requirements and Other Requirements](#)).~~

Admission Requirements:

- ~~Interview— A personal interview is required of all competitive applicants annually. Interview selection is based on academic record. Competitive applicants will be interviewed to determine if they have the personal qualities necessary for the profession. The interview evaluates an applicant's~~

not guarantee admission. Applicants will be assessed on the basis of their academic records as described below.

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 the Dental Assisting eligibility criteria~~ and ~~who~~ are successful in the Indigenous admissions process will be recommended by the Indigenous Admissions Subcommittee to the School of Dentistry, Dental Assisting 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.~~

~~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](#).~~

~~To be considered for admissions all candidates must meet all minimum admission requirements.~~

Eligibility Criteria for Admission

Academic Requirements: The minimum requirement for admission to the Dental Assisting Certificate Program is:

- Minimum of 65% in each of:
 - a. English Language Arts 30-1 or English Language Arts 30-2
 - b. Chemistry 30
 - c. Biology 30
 - d. One of the following: Math 30-1, Math 30-2, Pure Math 30 or Applied Math 30

High School Applicants

~~High school applicants will be considered for admission based on their admission average on four subjects noted above.~~

Transfer Applicants

~~Please refer to [Postsecondary Applicants](#) and [Transfer from a Postsecondary Institutions](#).~~

Personal Interview: Interview selection is based on academic record. Competitive applicants will be interviewed ~~by a team~~ to determine if they have the personal qualities necessary for the profession. The interview evaluates an applicant's maturity, motivation,

maturity, motivation, initiative, ability to communicate, personal qualities and interests.

Other Requirements:

1. **Language Proficiency Requirements:** All applicants must meet the English Language Proficiency and Spoken English requirements (see [Language Proficiency Requirements](#)).
2. **First Aid - Prior to Entering the Program:** CPR-C (Basic Life Support - BLS) students must provide evidence of current BLS certification for entry into the program and remain current throughout clinical training.
3. **Medical Testing and Immunization Requirements:** Immunization records are due at the time admission is confirmed. See [University Infectious Diseases Regulation](#).
4. **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.
5. **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*.

**Students who can provide proof of completing*

initiative, ability to communicate, personal qualities and interests. The interview schedule differs every year; short-listed applicants will be advised of the interview dates by email.

Other Requirements:

1. **Language Proficiency Requirements:** All applicants must meet the English Language Proficiency and Spoken English requirements (see [Language Proficiency Requirements](#)).
2. **Medical Testing and Immunization Requirements:** Immunization records are due at the time admission is confirmed. See [University Infectious Diseases Regulation](#).
3. **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 School 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.
4. **Completion of Indigenous Canada Massive Open Online Course (MOOC):** Admitted applicants should be aware that as part of the program completion requirements, they must provide a certificate of completion of the University of Alberta Faculty of Native Studies Indigenous Canada MOOC.

**Students who can provide proof of completing*

Aboriginal Studies 30, via a high school transcript, are considered to have satisfied this requirement.

6. **Computer Literacy and Requirements:** Online learning is a critical component of course delivery in this program. To ensure all students have the tools they require in order to meet their academic goals, all Dental Assisting students will require, at minimum: access to a computer with a webcam, and a high speed internet connection.

Selection Criteria: To be considered for admission, applicants need to:

- Have the required courses for their program;
- Meet the minimum requirements for their program;
- Fill out a complete application for admission with application fee

Academic Average:

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. Applicants must meet the minimum requirements in all subjects, even after receiving an admission offer, in order to remain admissible.

Interview Selection is based on interim transcripts, including other post-secondary academic records if applicable. Competitive applicants will be interviewed by a

Aboriginal Studies 30, via high school transcript, are considered to have satisfied this requirement

5. **Computer Literacy and Requirements:** Online learning is a critical component of course delivery in this program. To ensure all students have the tools they require in order to meet their academic goals all Dental Assisting students will require, at minimum: access to a computer with a webcam, and a high speed internet connection.

Selection Criteria: Applicants profiles are made up of the following:

1. Admission average / AGPA
2. Interview Score

Academic Average: High school applicants will be considered for admission based on their admission average in the required subjects.

For applicants with previous postsecondary education:

- Applicants who have successfully completed 24 units of course weight or more transferable to the University of Alberta may be considered for admission on the basis of their postsecondary AGPA and any other admission requirements applicable to the program.
- Applicants 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 in the 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 as well as any other admission requirements applicable to the program.
- Applicants with 6 units or less of transferable postsecondary work may be considered for admission using only their high school average in the required courses and any other admission requirements applicable to the program.

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. Applicants must meet all minimum pre-professional requirements to be considered for admission.

Deposit

Upon notification of acceptance, applicants will be required to confirm their admission and intention to register by submitting a nonrefundable tuition deposit within the time

<p>team to determine if they have the personal qualities necessary for the profession. The interview evaluates an applicant's maturity, motivation, initiative, ability to communicate, personal qualities and interests. Short listed applicants will be advised of the interview dates by email.</p>	<p>specified in the letter of acceptance. The deposit will be credited toward payment of tuition upon completion of registration. (See Program Specific Deposits on Confirmation of Admission).</p>
<p>Colleges and Faculties>Faculty of Medicine and Dentistry>Academic Regulations>Academic Standing and Promotion https://calendar.ualberta.ca/content.php?catoid=39&navoid=12264#academic-standing-and-promotion</p>	
<p>Academic Standing and Promotion</p> <p>Students enrolled in health professional programs are under the obligation to meet the expected competencies through achieving learning objectives as distributed throughout the existing courses in the current program, attendance policies and other expected requirements. The programs are sequentially designed to provide students with the opportunity to ultimately demonstrate satisfactory completion of all necessary requirements and competencies to graduate and be eligible for licensure in their respective profession.</p> <p>As a student progresses through their professional program, they participate in more advanced clinical and patient care learning, and their ability to competently provide care, adhere to codes of ethics and expected professional behaviour, builds upon previous knowledge, skills, attitude and behaviours. Therefore promotion from year to year and ultimately graduation requires full completion of all program requirements in that current year before being able to progress to more advanced responsibilities and clinical learning.</p> <p>The academic progress of all students in the FoMD undergraduate programs are subject to review each year by both Program Academic Standing and Faculty Academic Standing and Promotion committees.</p> <p>At the beginning of each academic year, students in each program will be advised of all relevant academic policies, including Faculty and University appeal processes.</p>	<p>Academic Standing and Promotion</p> <p>Students enrolled in health professional programs are under the obligation to meet the expected competencies through achieving learning objectives as distributed throughout the existing courses in the current program, attendance policies and other expected requirements. The programs are sequentially designed to provide students with the opportunity to ultimately demonstrate satisfactory completion of all necessary requirements and competencies to graduate and be eligible for licensure in their respective profession.</p> <p>As a student progresses through their professional program, they participate in more advanced clinical and patient care learning, and their ability to competently provide care, adhere to codes of ethics and expected professional behaviour, builds upon previous knowledge, skills, attitude and behaviours. Therefore promotion from year to year and ultimately graduation requires full completion of all program requirements in that current year before being able to progress to more advanced responsibilities and clinical learning.</p> <p>The academic progress of all students in the FoMD undergraduate programs (not including students who are enrolled in the Dental Assisting Certificate Program) are subject to review each year by both Program Academic Standing and Faculty Academic Standing and Promotion committees.</p> <p>At the beginning of each academic year, students in each program will be advised of all relevant academic policies, including Faculty and University appeal processes.</p>
<p>Colleges and Faculties>Faculty of Medicine and Dentistry>Academic Regulations</p>	

<https://calendar.ualberta.ca/content.php?catoid=39&navoid=12264#academic-standing-and-promotion>

<https://calendar.ualberta.ca/content.php?catoid=39&navoid=12264#reexamination-reassessment>

Academic Standing and Promotion

[...]

Certificate in Dental Assisting

Academic Standing

- Decisions regarding academic standing for graduation are made by the Director, Dental Assisting and the full-time Dental Assisting Faculty.
- Each student's academic standing will normally be assessed at the end of each course.
- No student may proceed to the next course, until they have met all prerequisites.
- For graduation, students need to adhere to and meet the requirements as stated in the department's current Attendance Policy.
- Awards distribution will be based on a full course load only and utilizing original not reexamination or reassessment grades in calculation of the GPA.
- Students are advised of Faculty and University appeals processes at the beginning of each academic year.

Students in the DA program are required to participate in a full course load due to the sequential and integrated learning expectations of the professional certificate program. As necessary prerequisite material is covered in previous courses, all preceding courses are considered as prerequisite courses for the next course(s) in sequence.

Students must complete their certificate requirements within two academic years from the time of their initial admission. This time limit includes all time during which a student is not in attendance, either for personal reasons (see [Voluntary Temporary Withdrawal](#)) or as a result of suspension or academic probation. Any failure or inability to complete the program within two years is cause for Requirement to Withdraw from the program.

Reexaminations/Reassessment

[...]

Certificate in Dental Assisting

Reexaminations

- Students are allowed reexamination only in courses or didactic components of courses that are failed.
- For any failed course or didactic component of a course, the following reexamination policies apply:
- The Director, Dental Assisting may allow reexamination of a course or didactic component of a course only where the Final Examination is a 40% or greater component of the course grade.

- The Director, Dental Assisting may allow reexamination of a didactic component of a course if a student fails the didactic component of a clinical or laboratory course but passes the clinical or laboratory portion. Reexamination is not permitted in courses that are entirely clinical or laboratory or in clinical or laboratory components of courses that include both didactic and clinical or laboratory components.
- If a reexamination is approved, satisfactory completion of a remedial program may be required by the The Director, Dental Assisting before the student is permitted to take the reexamination.
- The reexamination mark will replace the original final exam mark. For the course to be passed, the new grade with the new reexamination final exam mark, must equal or surpass the required passing grade for the course.
- Students may be granted rewrites at the end of each term for failed courses within that term that meet the above requirements, but not exceeding more than two overall in their program.
- A student who does not take a reexamination within the period of time prescribed by the Faculty will remain with a failed course, and a failed year and will not be to continue in the program.

Reassessment

Students are allowed reassessment only in courses or course components that are failed. For any failed course or course component, the following reassessment policies apply:

- The Director, Dental Assisting may allow reassessment of any failed course or component of a course as follows: didactic components where an examination is less than 40% course weight, laboratory, and/or clinical components.
- If a reassessment is approved, satisfactory completion of a remedial program may be required by the Director, Dental Assisting program before the student is permitted to take the reassessment.
- If reassessment is approved for a failed course or course component, the student will be informed of the required reassessment activities, the expected level of achievement to successfully complete them and the timelines for completion.

If reassessment is successfully completed, the grade obtained for the reassessed area will be the established pass score for the assessment.

Colleges and Faculties>Faculty of Medicine and Dentistry
https://calendar.ualberta.ca/preview_entity.php?catoid=39&ent_oid=5000

Faculty of Medicine and Dentistry

Contact Information

Admission Information

For MD Program, 1-002 Katz Group Centre for Pharmacy and Health Research (780) 492-6350

For MLS Program, 5-411 Edmonton Clinic Health Academy (780) 492-6601

For Dentistry and Dental Hygiene Programs, 5th Floor Edmonton Clinic Health Academy (780) 492-1319

For Radiation Therapy Program, 3-12 University Terrace (780) 492-6918

Academic Matters

Associate Dean (Undergraduate Medical Education), 1-002 Katz Group Centre for Pharmacy and Health Research (780) 492-9523

Associate Dean (Postgraduate Medical Education), 2-76 Zeidler Ledcor Centre (780) 492-4751

Associate Chair (Academic, Dentistry), 5th Floor Edmonton Clinic Health Academy (780) 492-3312

General Information

- [The Faculty of Medicine and Dentistry](#)
- [Members of the Faculty](#)
- [Department of Dentistry Objectives](#)
- [Affiliated Hospitals and Institutions](#)
- [Registration and Licensing](#)
- [Finance](#)
- [Medical and Dental Society Memberships](#)

Admission

- [Admission](#)

Academic Regulations

- [Professional Standards](#)
- [Technical Standards](#)
- [Certification Requirements](#)
- [Course Exemption/Credits](#)
- [Attendance](#)
- [Faculty Advisor](#)
- [Grades and Ranking](#)
- [Academic Standing and Promotion](#)
- [Reexamination/Reassessment](#)
- [Practicum Intervention](#)
- [Absences from Program](#)
- [Appeals and Grievances](#)

Programs of Study

- [Protection for Persons in Care](#)
- [MD with Special Training in Research](#)

Faculty of Medicine and Dentistry

Contact Information

Admission Information

For MD Program, 1-002 Katz Group Centre for Pharmacy and Health Research (780) 492-6350

For MLS Program, 5-411 Edmonton Clinic Health Academy (780) 492-6601

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General Information

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Admission

- [Admission](#)

Academic Regulations

- [Professional Standards](#)
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- [Academic Standing and Promotion](#)
- [Reexamination/Reassessment](#)
- [Practicum Intervention](#)
- [Absences from Program](#)
- [Appeals and Grievances](#)

Programs of Study

- [Protection for Persons in Care](#)
- [MD with Special Training in Research](#)

<ul style="list-style-type: none"> • Honors in Research Program in Medical Laboratory Science • Graduate Studies • Continuous Professional Learning • Continuing Dentistry Education • Postgraduate Medical Education • Postgraduate Dental Education • Combined Program for the Degrees of MD and PhD <p><u>Courses</u></p> <p>Programs</p> <p>Undergraduate</p> <ul style="list-style-type: none"> • Bachelor of Medical Science • Bachelor of Science Dental Hygiene • Bachelor of Science in Medical Laboratory Science • Bachelor of Science in Medical Laboratory Science Post-Professional Certification degree completion • Bachelor of Science in Radiation Therapy • Doctor of Dental Surgery • Doctor of Dental Surgery Advanced Placement Program • Doctor of Medicine <p>Graduate</p> <ul style="list-style-type: none"> • Doctor of Medicine and Doctor of Philosophy Combined Degrees Program <p>Certificate</p> <ul style="list-style-type: none"> • Certificate in Biomedical Research 	<ul style="list-style-type: none"> • Honors in Research Program in Medical Laboratory Science • Graduate Studies • Continuous Professional Learning • Continuing Dentistry Education • Postgraduate Medical Education • Postgraduate Dental Education • Combined Program for the Degrees of MD and PhD <p><u>Courses</u></p> <p>Programs</p> <p>Undergraduate</p> <ul style="list-style-type: none"> • Bachelor of Medical Science • Bachelor of Science Dental Hygiene • Bachelor of Science in Medical Laboratory Science • Bachelor of Science in Medical Laboratory Science Post-Professional Certification degree completion • Bachelor of Science in Radiation Therapy • Doctor of Dental Surgery • Doctor of Dental Surgery Advanced Placement Program • Doctor of Medicine <p>Graduate</p> <ul style="list-style-type: none"> • Doctor of Medicine and Doctor of Philosophy Combined Degrees Program <p>Certificate</p> <ul style="list-style-type: none"> • Certificate in Biomedical Research • Certificate in Dental Assisting
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Undergraduate Admissions>Undergraduate Application Process and Deadlines>Admission and Readmission Deadlines>Faculty of Medicine and Dentistry> **New Entry**
https://calendar.ualberta.ca/content.php?catoid=39&navoid=12383#admission_and_readmission_deadlines

Certificate (Dental Assisting)					
	Admission		Readmission		Other Requirements
	Application	Documents	Application	Documents	
Fall Term	May 1	May 1	May 1	May 1	
Winter Term	November 1	November 1	November 1	November 1	

Reviewed/Approved by:

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

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



Decision **Discussion** **Information**

ITEM OBJECTIVE:

1. To approve the creation of a new Option “Bioprocessing & Biomanufacturing” in the Bachelor of Science in the Chemical Engineering Program.
2. To approve the suspension of the Biomedical Option in the Chemical Engineering Program.

DATE	04 October 2023
TO	GFC Programs Committee
RESPONSIBLE PORTFOLIO	Faculty of Engineering

MOTION:

1. THAT the GFC Program Committee, with delegated authority from General Faculties Council, approve the proposed second-level specialization, Bioprocessing & Biomanufacturing Option, for the Bachelor of Science in Chemical Engineering for implementation July 2024.
2. THAT the GFC Program Committee with delegated authority from General Faculties Council, approve the suspension of the second-level specialization, Biomedical Option for the Bachelor of Science in Chemical Engineering for implementation July, 2024.

EXECUTIVE SUMMARY:

The Chemical Engineering Program at University of Alberta is considered by some to be aligned primarily to the oil and gas industries. This perception has led to a drop in interest, especially in light of oscillating energy prices and challenges related to emissions. Furthermore, the recent pandemic and the response to it has fueled an interest in Biomanufacturing and Bioprocesses.

Both federal and provincial governments have shown interest in developing Canadian manufacturing of biopharmaceuticals and vaccines. A rapid increase in the number of industrial and research stakeholders in the field of Bioprocess Engineering and Biomanufacturing has been experienced in recent years. Considering the advancements in the research and development facilities, investors are moving toward Alberta for their investments in bioprocessing industries¹.

¹ [Alberta for Biotech Investments](#)

GOVERNANCE OUTLINE



ITEM NO. 6

This will provide employment opportunities for graduates to work in industries that use biochemical processes, such as food and brewing process engineering, wastewater treatment, pharmaceutical industries, algae growth for GHG emission control, and processes that involve enzymes or microorganisms and fermentation, including emerging biomass and biofuel industries.

The proposed option is distinctly different from the existing Biomedical Engineering Program Option (which can run independently) in the Faculty of Engineering. The Biomedical Engineering Option focuses significantly on human anatomy and physiology, whereas the proposed Option *Bioprocessing & Biomanufacturing* focuses on the process design for product manufacturing using living cells or their components. Thus, graduates will still be able to utilize all the traditional Chemical Engineering fundamentals to understand and engineer bioreactors, design bioprocesses and genetic engineering strategies, and develop innovating biochemical technologies with industrial applications. In addition, the program also prepares students for work in traditional chemical/oil industries. Work-integrated learning is a unique dimension offered in the Co-op sequence of the proposed Option, which is not offered in competitive programs running in other universities. Furthermore, experiential learning is included in the program structure through a series of design-focused courses wherein students will be working on open-ended design problems.

In addition, the Department is proposing suspension of both the traditional and co-op sequences of the “Bachelor of Science in Chemical Engineering - Biomedical Option”, considering zero enrollment in this Option since Year 2018. Internal resources used in the Biomedical Option can be reallocated to the proposed Bioprocessing and Biomanufacturing Option.

Currently, three Options (Computer Process Control, Oil Sands Elective, and Biomedical), in addition to the core Chemical Engineering, appear in the University Calendar for the Undergraduate Chemical Engineering Program. All of these Options are offered in traditional and co-op sequences. Furthermore, the core Chemical Engineering Program includes traditional, Co-op Plan I, and Co-op Plan II sequences. Thus, the Department offers nine streams in the Chemical Engineering program. Out of these streams, the Department is planning to suspend Oil Sands Elective Option, Biomedical Option, and Co-op Plan II sequence. Phasing out these Options and corresponding sequences will eliminate five streams out of nine that are currently offered. Thus, the Department will have enough resources required to accommodate the proposed new Option in replacement of the eliminated sequences.



Supporting Materials:

Appendix A (List of Consultations)

Appendix B (Program structure including core courses, electives, and credit units per year)

Appendix C (Course Sequence in the Proposed Option)

Attachments:

1. Course Sequence_Traditional_Rev5_Oct 03
2. Course Sequence_Co-op_Rev_4_Oct 03
3. CH E 484_Intro to Biochemical Engineering_Rev 2_Oct 03
4. CH E 581_Biocatalysis and Bioreactors_Rev 2_Oct 03
5. CH E 583_Design in Bioengineering_Rev 2_Oct 03
6. Bioprocesses_internal-program-proposal_Rev5_Oct 03
7. Biomedical Option_internal-suspension-form_Oct 03
8. Supporting Information_Bioprocessing_Curriculum Motion_Rev.5_Oct 03

***See Schedule A for additional items to include if needed.**

SCHEDULE A:

Engagement and Routing

Consultation and Stakeholder Participation / Approval Route (parties who have seen the proposal and in what capacity) <[Governance Resources Section Student Participation Protocol](#)>

Those who are actively participating:

- Dr. Pierre Mertiny, Associate Dean, Undergraduate programs, Faculty of Engineering
- James Bracken, Programs and Planning Officer, Faculty of Engineering - Undergrad Program
- Dr. Leijun Li, Chair, Department of Chemical and Materials Engineering
- Dr. Anthony Yeung, Associate Dean, Undergraduate Studies, Department of Chemical and Materials Engineering
- Dr. Vinay Prasad, Professor, Department of Chemical and Materials Engineering
- Dr. Arvind Rajendran, Professor, Department of Chemical and Materials Engineering
- Dr. Garima Chauhan, Undergraduate Curriculum Renewal Lead, Department of Chemical and Materials Engineering.
- Faculty members in the Department of Chemical and Materials Engineering, including Samir Mushrif, Zukui Li, Dominic Sauvageau, Natalia Semagina, Dave Sharp, and Phillip Choi.



Those who have been **consulted**:

- Chemical Engineering Students' Society, Department of Chemical and Materials Engineering.
- Industry Stakeholders (Genome Alberta, Entos Pharmaceuticals)
- Provost Office (Carley Roth, Portfolio Initiatives Manager, Provost & Vice-President Academic - Admin)
- Faculty of Medicine and Dentistry (Dr. Adrienne Wright, Faculty Service Officer, Faculty of Medicine & Dentistry - Department of Biochemistry)
- Faculty of Science (Dr. Maya Evenden, Professor, Faculty of Science - Biological Sciences)
- Faculty of Science (Dr Corwin Sullivan, Associate Professor and Associate Chair, Department of Biological Sciences).
- Registrar's Office (Jesse Luyendyk, Assistant Registrar, Enrolment Services, Office of the Registrar - Exams & Timetabling)
- Registrar's Office (Rebecca Liaw, University Calendar Editor, Office of the Registrar - Policy Governance Calendar)
- College of Natural and Applied Sciences (Jesse Luyendyk, Assistant Registrar, Enrolment Services, Office of the Registrar - Exams & Timetabling, and Carrie Dube, Course Sched & TT Coord, College of Natural and Applied Sciences - Office of Education)
- Center for Teaching and Learning (Anita Parker, Lead Educational Developer, Online and Hybrid Instruction & Strategy)
- Florence Glanfield, Vice-Provost (Indigenous Programming and Research), reviewed proposal and approved it moving forward on Sept 26
- Carrie Smith, Vice-Provost (Equity, Diversity and Inclusion), reviewed proposal and approved it moving forward on Sept 27

Please refer to Appendix A for consultation records.

Those who have been **informed**:

- All academic faculty members in the Faculty of Engineering
- Undergraduate students in the Faculty of Engineering
- Broader University of Alberta community (outside Engineering) informed through Program Support Team proposal review



Approval Route:

Reviewed and Approved by Department Council Members: **August 17, 2022**

Reviewed and Approved by Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Approved by Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Reviewed by Program Support Team (PST): **September 28, 2023**

GFC Programs Committee (GFC-PC): **(TBD)**



Appendix A: List of Consultations

Consultations	Date	Feedback
<p>Students</p> <p>A meeting was held with the representatives from the Chemical Engineering Students' Society (ChESS) and Material Engineering Students' Society (MESS) in August 2021. An outreach survey was developed to gauge the level of interest amongst undergraduate students for different options.</p>	<p>August 2021</p>	<p>The survey results indicate an interest in bioprocesses and biomanufacturing among students, suggesting that students will be open to taking this option in the Chemical Engineering program.</p> <p>(Link)</p>
<p>Industry Support – Genome Alberta</p>	<p>Dec. 23, 2021</p>	<p>Received a letter of support.</p> <p>(Link)</p>
<p>Department Council</p> <p>The proposed program description and structure was presented during Chemical and Materials Engineering departmental council meetings to solicit feedback from colleagues and online voting was conducted.</p>	<p>August 17, 2022</p>	<p>The members of the Department Council supported the proposed Option and provided constructive feedback. The suggestions were integrated into the curriculum development process for the proposed option.</p> <p>(Link)</p>
<p>Associate Dean, Undergraduate Studies</p>	<p>April 24, 2023</p>	<p>Prof. Pierre Mertiny, Associate Dean for Undergraduate Studies, Faculty of Engineering, reviewed the proposed option and supported our initiative in this field.</p> <p>(Link)</p>
<p>Industry Support – Entos Pharmaceuticals</p>	<p>May 04, 2023</p>	<p>Received a letter of support.</p> <p>(Link)</p>
<p>Provost Office (Carley Roth and Suzanne French)</p>	<p>May 08, 2023</p>	<p>Consultation pathways were suggested that are required to complete the internal program proposal form.</p>



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		(Link)
<p>Faculty of Medicine and Dentistry (BIOCH 200)</p> <p>Possibility of accommodating Chemical and Materials Engineering students in BIOCH 200, offered by the Faculty of Medicine and Dentistry, was consulted with Dr. Adrienne Wright, Faculty Service Officer, Faculty of Medicine & Dentistry - Biochemistry Dept.</p>	May 10, 2023	<p>Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p> <p>(Link)</p>
<p>Faculty of Science (MICRB 265)</p> <p>The possibility of accommodating students in the MICRB 254 courses, which is listed as the program & technical electives in the proposed Option, was discussed with Dr. Maya Evenden, Associate Chair (Undergraduate), Faculty of Science - Biological Sciences.</p>	May 18, 2023	<p>Dr. Evenden suggested that spots cannot be reserved in this class for Chemical Engineering students because the course is listed as elective in this Option and not necessarily required for the completion of undergraduate degree in the proposed Option.</p> <p>(Link)</p> <p>Since students can take these courses in any semester, we are expecting a maximum of 10-15 students in each year who will sign-up for these courses. Based on this information, students will likely be accommodated in the MICRB 265.</p> <p>If the Faculty of Science cannot accommodate students from the proposed Option in MICRB 265, students can still enroll for BIOCH 200. Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p>



ITEM NO. 6

<p>Registrar's Office</p> <p>Fee index and course numbers were consulted with Jesse Luyendyk, Assistant Registrar, Enrolment Services, Office of the Registrar - Exams & Timetabling.</p>	<p>June 15, 2023</p>	<p>Received the suggestions regarding fee index and course numbers for new courses.</p> <p>(Link)</p>
<p>Registrar's Office</p> <p>Calendar change requirements were consulted with Rebecca Liaw, University Calendar Editor, Office of the Registrar - Policy Governance Calendar.</p>	<p>June 19, 2023 / June 29, 2023</p>	<p>A few changes related to formatting requirements were suggested in order to make the forms ready for calendar editing. All the suggestions were incorporated in the calendar change request forms. The revised documents were reviewed and approved by Registrar's office.</p> <p>(Link)</p>
<p>Jesse Luyendyk and Carrie Dube,</p> <p>Consulted regarding course scheduling.</p>	<p>June 26, 2023</p>	<p>No scheduling issues were anticipated for second year students taking the new Options in September 2024 (assuming the new Options make the January 2024 calendar).</p>
<p>Centre for Teaching and Learning</p> <p>Anita Parker, Lead Educational Developer, Online and Hybrid Instruction & Strategy</p>	<p>July 06, 2023</p>	<p>Consulted with CTL regarding learning outcomes for new courses.</p> <p>(Link)</p>
<p>Faculty of Science (BIOL 107)</p> <p>Possibility of accommodating Chemical and Materials Engineering students in BIOL 107 (which is a core course in the proposed Option), offered by the Faculty of Science, was consulted with Dr Corwin Sullivan, Associate Professor and Associate Chair, Department of Biological Sciences.</p>	<p>Sept 11, 2023</p>	<p>The Faculty of Science supported the proposed Option and kindly agreed to accommodate our students in BIOL 107 as a core course.</p> <p>(Link)</p>



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Indigenous Strategies Florence Glanfield, Vice-Provost (Indigenous Programming and Research)	Sept 26, 2023	Reviewed proposal and approved it moving forward.
Equity, Diversity and Inclusion Strategies Carrie Smith, Vice-Provost (Equity, Diversity and Inclusion)	Sept. 27, 2023	Reviewed proposal and approved it moving forward.



Appendix B: Program structure including core courses, electives, and credit units per year.

Table B.1: Program Structure - Traditional Sequence

Component	1st year	Credits	2nd year	Credits	3rd Year	Credits	4th year	Credits
Core courses ²	12	40.6	11	36.1	10	37.3	9	30
Program & Technical electives	-	-	-	-	1	3	1	3.5
Complementary Studies elective	-	-	1	3	-	-	1	3
ITS (<i>Impact of Technology on Society</i>) elective	-	-	1	3	-	-	-	-
Total	12	40.6	13	42.1	11	40.3	11	36.5

² One of the core courses, CME 200 (Introduction to Chemical and Materials Engineering), is offered in a single day asynchronously. Thus, practically offered core courses with respect to students' workload are 22 in junior years.



Table B.2: Program Structure – Co-op Sequence

Component	1st year	Credits	2nd year	Credits	3rd Year	Credits	4th year	Credits	5th Year	Credits
Core courses	12	40.6	12	37.6	10	37.3	4	13	5	17
Program & Technical electives	-	-	-	-	1	3	1	3.5	-	-
Complementary Studies elective	-	-	1	3	-	-	1	3	-	-
ITS (<i>Impact of Technology on Society</i>) elective	-	-	1	3	-	-	-	-	-	-
Work Integrated Learning	-	-	1	0.5	1	0.5	2	1	1	3
Total	12	40.6	15	44.1	12	40.8	8	20.5	6	20



Appendix C: Sequence of courses in the traditional Chemical Engineering program and the proposed changes in the Option “*Bioprocessing and Biomanufacturing*”.

Table C.1: Sequence of courses in the traditional Chemical Engineering Program

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	P&T Elective
MATH 209	STAT 235	P&T Elective ³	ENG M 310/401	CS Electives	P&T Elective
CS Elective ⁴	ITS Elective ⁵		ENGG 404	P&T Elective	
CS Elective					

Table C.2: Sequence of courses in the proposed Option (: Course Rearrangement; : Course Addition; : Course Withdrawal)

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	CH E 484
MATH 209	STAT 235	P&T Elective	ENG M 310/401	CS Electives	CH E 581
CS Elective	BIOL 107		ENGG 404	P&T Elective	P&T Elective
ITS Elective	ITS Elective				P&T Elective
CS Elective					

³ The proposed Option adds three *Program and Technical (P&T) electives* in the list of P&T electives offered in the traditional CH E program.

⁴ List of *Complementary Studies (CS) electives* offered in the proposed option is the same as offered in the traditional CH E program.

⁵ List of *Impact of Technology on Society (ITS) Elective* in the proposed option is the same as offered in the traditional CH E program.

Faculty (& Department or Academic Unit):	Faculty of Engineering Chemical & Materials Engineering
Contact Person:	Prof. Anthony Yeung (tony.yeung@ualberta.ca) Associate Dean, Undergraduate Studies
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 (Second-Level Specialization) • Regulation
For which term is this intended to take effect?	Fall 2024 onwards
Does this proposal have corresponding course changes? (Should be submitted at the same time)	Yes (attached as separate forms)

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 Chemical Engineering Program at University of Alberta is considered by some to be aligned primarily to the oil and gas industries. This perception has led to a drop in interest, especially in light of oscillating energy prices and challenges related to emissions. Furthermore, the recent pandemic and the response to it has fueled an interest in Biomanufacturing and Bioprocesses.

The proposed Option is distinctly different from the existing Biomed Program Option (which can run independently) in the Faculty of Engineering. The Biomed Option focuses significantly on human anatomy and physiology, whereas our proposed Option *Bioprocessing & Biomanufacturing* focuses on the process design for product manufacturing using living cells or their components. Thus, graduates will still be able to utilize all the traditional Chemical Engineering fundamentals to understand and engineer bioreactors, design bioprocesses and genetic engineering strategies, and develop innovating biochemical technologies with industrial applications. In addition, students can work in traditional chemical/oil industries as well.

The department has consulted with internal stakeholders including Department council members, Faculty of engineering, students, and industry stakeholders. Details are given in the “**Internal Program Proposal**” form.

Calendar Copy

URL in current Calendar (or “New page”)

New Page “**Bachelor of Science in Chemical Engineering - Bioprocessing & Biomanufacturing Option**”

Section “Undergraduate- Chemical Engineering”

(<https://calendar.ualberta.ca/content.php?catoid=39&navoid=12425#faculty-of-engineering>)

Current Copy: Removed language	Proposed Copy: New language
	<p>Bachelor of Science in Chemical Engineering - Bioprocessing & Biomanufacturing Option</p> <p>Engineering Disciplines To find descriptions of the various disciplines of Engineering, visit Explore our Programs on the Faculty of Engineering website.</p> <p>Admission Requirements General Undergraduate Admission Requirements Admission Requirements for Qualifying Year</p> <p>Academic Regulations University Regulations Faculty of Engineering Regulations</p> <p>Program Requirements</p> <p>Year 1 Requirements for Year 1 can be found in Bachelor of Science in Engineering - Qualifying Year. Information regarding admission to a specialized program from the Qualifying Year Program can be found in Faculty of Engineering Regulations.</p> <p>Year 2</p> <p>Term 3 CH E 243 - Engineering Thermodynamics CHEM 261 - Organic Chemistry I CME 200 - Introduction to Chemical and Materials Engineering CME 265 - Process Analysis MATH 209 - Calculus for Engineering III ITS Elective (3-0-0) Complementary Studies Elective (3-0-0)</p> <p>Term 4 CH E 312 - Fluid Mechanics ECE 209 - Fundamentals of Electrical Engineering MATH 201 - Differential Equations MAT E 202 - Materials Science II</p>

STAT 235 - Introductory Statistics for Engineering
BIOL 107 - Introduction to Cell Biology

Year 3

Term 5

CH E 314 - Heat Transfer
CH E 343 - Chemical Engineering Thermodynamics
CH E 351 - Chemical Engineering Laboratory
CH E 374 - Computational Methods in Engineering
Program & Technical Elective (3-0-0)

Term 6

CH E 316 - Equilibrium Stage Process
CH E 318 - Mass Transfer
CH E 345 - Chemical Reactor Analysis I
CH E 358 - Process Data Analysis

ENG M 310 - Engineering Economy

OR

ENG M 401 - Financial Management for Engineers

ENGG 404 - Engineering Safety and Risk
Management-Leadership in Risk Management

Year 4

Term 7

CH E 445 - Chemical Reactor Analysis II
CH E 446 - Process Dynamics and Control
CH E 464 - Chemical Engineering Design I
CME 481 - Colloquium I
Complementary Studies Elective (3-0-0)
Program & Technical Elective (3-1s-0)

Term 8

CH E 454 - Chemical Engineering Project Laboratory
CH E 465 - Chemical Engineering Design II
ENGG 400 - The Practice of the Engineering
Profession
CH E 484 - Introduction to Biochemical Engineering
CH E 581 - Biocatalysis and Bioreactors

Notes

See Program and Technical Electives below for restrictions
on the two program electives.

Complementary Studies and Impact of Technology on Society (ITS) Electives

See [Complementary Studies and Impact of Technology on Society \(ITS\) Electives](#) for a list of approved electives.

Program and Technical (Engineering Science) Electives

The Engineering Science elective course must be selected from:

- **BIOCH 200** - Introductory Biochemistry
- **MICRB 265** - General Microbiology

Other courses may be selected as Program and Technical Science Electives from lists given in [Bachelor of Science in Chemical Engineering](#) with written permission from the Department and program coordinator prior to enrollment.

Program & Technical (Engineering Design) Electives

The Engineering Design elective can be either **CH E 583 - Design in Bioengineering** or selected from lists in [Bachelor of Science in Chemical Engineering](#). Other courses may be taken with written permission from the Department **prior** to enrollment.

*CME 458 or CME 459 may be taken with an appropriate project approved by the department and the program coordinator.

CH E 583 - Design in Bioengineering (New)

3.5 (fi 6) (either term, 3-0-1) Exploration of how design principles are implemented in biotechnology and bioengineering. Topics cover all scales of bioengineering from processes to cells and biomolecules, and include how tools and innovative approaches, such as bioinformatics, artificial intelligence, influence the field.

Reviewed/Approved by:

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

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

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

Faculty (& Department or Academic Unit):	Faculty of Engineering Chemical & Materials Engineering
Contact Person:	Prof. Anthony Yeung (tony.yeung@ualberta.ca) Associate Dean, Undergraduate Studies
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 (Second-Level Specialization, Co-op Sequence) • Regulation
For which term is this intended to take effect?	Fall 2024 onwards
Does this proposal have corresponding course changes? (Should be submitted at the same time)	Yes (attached as separate forms)

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 Chemical Engineering Program at University of Alberta is considered by some to be aligned primarily to the oil and gas industries. This perception has led to a drop in interest, especially in light of oscillating energy prices and challenges related to emissions. Furthermore, the recent pandemic and the response to it has fueled an interest in Biomanufacturing and Bioprocesses.

Work-integrated learning is a unique dimension offered in the Co-op sequence of the proposed Option, which is not offered in competitive programs running in other universities.

The proposed Option is distinctly different from the existing Biomed Program Option (which can run independently) in the Faculty of Engineering. The Biomed Option focuses significantly on human anatomy and physiology, whereas our proposed option *Bioprocessing & Biomanufacturing* focuses on the process design for product manufacturing using living cells or their components. Thus, graduates will still be able to utilize all the traditional Chemical Engineering fundamentals to understand and engineer bioreactors, design bioprocesses and genetic engineering strategies, and develop innovating biochemical technologies with industrial applications. In addition, students can work in traditional chemical/oil industries as well.

The department has consulted with internal stakeholders including Department council members, Faculty of Engineering, students, and industry stakeholders. Details are given in the “**Internal Program Proposal**” form.

Calendar Copy

URL in current Calendar (or “New page”)

New Page “**Bachelor of Science in Chemical Engineering Co-op – Bioprocessing & Biomanufacturing Option**”

Section “Undergraduate- Chemical Engineering”

(<https://calendar.ualberta.ca/content.php?catoid=39&navoid=12425#faculty-of-engineering>)

Current Copy: Removed language	Proposed Copy: New language
	<p>Bachelor of Science in Chemical Engineering Co-op - Bioprocessing & Biomanufacturing Option</p> <p>Engineering Disciplines To find descriptions of the various disciplines of Engineering, visit Explore our Programs on the Faculty of Engineering website.</p> <p>Admission Requirements General Undergraduate Admission Requirements Admission Requirements for Qualifying Year</p> <p>Academic Regulations University Regulations Faculty of Engineering Regulations</p> <p>Program Requirements</p> <p>Year 1 Requirements for Year 1 can be found in Bachelor of Science in Engineering - Qualifying Year. Information regarding admission to a specialized program from the Qualifying Year Program can be found in Faculty of Engineering Regulations.</p> <p>Year 2</p> <p>Fall Term 3 CH E 243 - Engineering Thermodynamics CME 200 - Introduction to Chemical and Materials Engineering CHEM 261 - Organic Chemistry I ENGG 299 - Orientation to Cooperative Education MAT E 202 - Material Science II MATH 209 - Calculus for Engineering III ITS Elective (3-0-0) Complementary Studies Elective (3-0-0)</p> <p>Winter Term 4 CME 265 - Process Analysis CH E 312 - Fluid Mechanics</p>

ECE 209 - Fundamentals of Electrical Engineering
 MATH 201 - Differential Equations
 STAT 235 - Introductory Statistics for Engineering
 BIOL 107- Introduction to Cell Biology

Summer

WKEXP 901- Engineering Work Experience I

Year 3

Fall

WKEXP 902- Engineering Work Experience II

Winter Term 5

CH E 314 - Heat Transfer
 CH E 343 - Chemical Engineering Thermodynamics
 CH E 351 - Chemical Engineering Laboratory
 CH E 374 - Computational Methods in Engineering
 Program & Technical Elective (3-0-0)

Summer Term 6

CH E 316 - Equilibrium Stage Process
 CH E 318 - Mass Transfer
 CH E 345 - Chemical Reactor Analysis I
 CH E 358 - Process Data Analysis

ENG M 310 - Engineering Economy

OR

ENG M 401 - Financial Management for Engineers

ENGG 404 - Engineering Safety and Risk
 Management-Leadership in Risk Management

Year 4

Fall

WKEXP 903 - Engineering Work Experience III

Winter Term 7

CH E 445 - Chemical Reactor Analysis II
 CH E 446 - Process Dynamics and Control
 CH E 464 - Chemical Engineering Design I
 CME 481 - Colloquium I
 Program & Technical Elective (3-1s-0)
 Complementary Studies Elective (3-0-0)

Summer

WKEXP 904 - Engineering Work Experience IV

Year 5**Fall**

WKEXP 905 - Engineering Work Experience V

Winter Term 8

CH E 454 - Chemical Engineering Project Laboratory

CH E 465 - Chemical Engineering Design II

ENGG 400 - The Practice of the Engineering

Profession

CH E 484 - Introduction to Biochemical Engineering

CH E 581 - Biocatalysis and Bioreactors

Notes

See Program and Technical Electives below for restrictions on the two program electives.

Complementary Studies and Impact of Technology on Society (ITS) Electives

See [Complementary Studies and Impact of Technology on Society \(ITS\) Electives](#) for a list of approved electives.

Program and Technical (Engineering Science) Electives

The one Engineering Science elective course must be selected from:

- **BIOCH 200** - Introductory Biochemistry
- **MICRB 265** - General Microbiology

Other courses may be selected as Program and Technical Science Electives from lists given in [Bachelor of Science in Chemical Engineering](#) with written permission from the Department and program coordinator prior to enrollment.

Program & Technical (Engineering Design) Electives

The one Engineering Design elective can be either **CH E 583 - Design in Bioengineering** or selected from lists in [Bachelor of Science in Chemical Engineering](#). Other courses may be taken with written permission from the Department **prior** to enrollment.

*CME 458 or CME 459 may be taken with an appropriate project approved by the department and the program coordinator.

CH E 583 - Design in Bioengineering (New)

3.5 (fi 6) (either term, 3-0-1) Exploration of how design principles are implemented in biotechnology and bioengineering. Topics cover all scales of bioengineering from processes to cells and biomolecules, and include how tools and innovative approaches, such as bioinformatics, artificial intelligence, influence the field.

Reviewed/Approved by:

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

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

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

Faculty (& Department or Academic Unit):	Faculty of Engineering Chemical & Materials Engineering
Contact Person:	Prof. Anthony Yeung (tony.yeung@ualberta.ca) Associate Dean, Undergraduate Studies
Level of change: (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
For which term will this change take effect?	Fall 2024 onwards

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

This course is listed as a core course in the final year (Term 8) of the proposed Option "[Bachelor of Science in Chemical Engineering– Bioprocessing & Biomanufacturing Option](#)". Changes in the existing course description are proposed to introduce the concepts of biochemical engineering in the field of waste management and bioremediation. Various biochemical approaches have been/are constantly being introduced for resource recovery and waste minimization; therefore, this is important for students to understand how to integrate engineering aspects in this field.

Course Template

Current:	Proposed:
<p>Subject & Number: CH E 484 Title: Intro to Biochemical Engineering Course Career: Undergraduate Units: 3.5 Approved Hours: 3-0-1 Fee index: 8 Faculty: Engineering Department: Chemical & Materials Engineering Typically Offered: either term or Spring/Summer</p> <p>Description</p> <p>Physical and chemical properties of cells, tissues, and biological fluids, Engineering analysis or processes such as cell growth and fermentation, purification of products,. Prerequisites: CME 265, and BIOL 107. Credit may not be obtained in this course if previous credit has been obtained for CH E 390</p>	<p>Subject & Number: CH E 484 Title: Intro to Biochemical Engineering Course Career: Undergraduate Units: 3.5 Approved Hours 3-0-1 Fee index: 8 Faculty: Engineering Department: Chemical & Materials Engineering Typically Offered: either term or Spring/Summer</p> <p>Description</p> <p>Engineering analysis of processes such as cell growth and fermentation, purification of products, waste management, and bioremediation.</p> <p>Prerequisites: CME 265 and BIOL 107.</p>

Reviewed/Approved by:

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

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

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

Supporting Information

Learning Outcomes

1. Define and analyze biological systems used in biochemical engineering, bioproduction, and biomanufacturing.
2. Calculate the physiological parameters linked to the cell growth.
3. Discuss suitability of various feedstocks based on their physicochemical properties for bioconversion, bioproduction and biomanufacturing.
4. Determine different steps involved in bioproduction and biomanufacturing (pre-treatment, upstream, downstream).
5. Analyze and design different biotransformation processes, such as fermentation and enzymatic conversion.
6. Analyze and design different downstream (recovery, purification, concentration) processes, such as filtration, dialysis, crystallization, diafiltration, chromatography.
7. Perform mass and energy balances for bioconversion processes, biological treatment of solid waste and wastewater, and bioremediation processes.
8. Evaluate the design requirements for bioproduction and biomanufacturing in different industries (energy, pharma, nutrition, specialty chemicals).

Relationship of Learning Outcomes and Graduate Attributes

Learning Outcome	Graduate Attribute	Instructional Level
1	Knowledge Base in Engineering	Developed
2	Knowledge Base in Engineering Problem Analysis	Developed
3	Knowledge Base in Engineering Investigation	Developed
4	Knowledge Base in Engineering	Developed
5	Investigation Design Economics Impact of Engineering on Society and Environment	Applied
6	Investigation Design Economics Impact of Engineering on Society and Environment	Applied
7	Problem Analysis Investigation	Applied
8	Investigation Use of Engg Tools Design Economics	Applied

	Impact of Engineering on Society and Environment	
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Assessments of Learning Outcomes

Learning Outcome	Assessments/Activities
1, 2, 3, 4, 5, 6,7,	Assignments, Quizzes, Midterm Exam, and Final Exam
5, 6, 7, 8	Design Project

Accreditation Units

AU Category	Linked to which learning outcome	Percentage of course content ¹
Math		
Natural Sciences		
Engineering Science	1–7	60.3%
Engineering Design (requires PEng)	5–8	39.7%
Complementary studies		
Other		

¹ Accreditation unit (AU) calculation –

- Total Lecture hours = course lecture hours as per calendar description x 12.6 weeks = X
- Total Seminar hours = course seminar hours as per calendar description x 12.6 weeks = Y
- Total Lab hours = course lab hours as per calendar description x 12.6 weeks = Z

Total course hours = X+Y+Z = TCH

Total AUs in a course $AU_{total} = 12.6 \times (X + \frac{1}{2} Y + \frac{1}{2} Z)$

Number of hours (lecture, seminar, lab) spent on teaching and doing examples of accreditation category "i", is H_i where subscript, i, is for the number total hours spent in course for either Math (M), Engineering Design (ED), Natural Sciences (NS), Engineering Science (ES), Complementary studies (CS), or Other (O)

Percentage course content in AU category i, is: $\%_i = H_i/TCH$

Accreditation unit for category i, is: $A_i = AU_{total} \times \%_i$

Final Course AUs

Total	Math	NS	ES	ED	CS	Other
44.1	-	-	26.6	17.5	-	-

Proposed Grading criteria (subject to change pending Instructor course modification)

The breakdown of the assessments included in this course is found in the table below.

Component	Percentage
Assignments/Quiz (Max. 5)	15%
Midterm Exam	25%
Project	20%
Final Exam (Written)	40%
Total	100%

Unexcused absence from Midterm Examination will result in 0 out of 25%. With legitimate excuse, the Midterm weight will be carried over to the Final (i.e., Final Exam will be worth 65% of the overall grade).

Recommended Textbooks:

1. Biochemical Engineering: A Textbook for Engineers, Chemists and Biologists, (2015) S. Katoh, J. Horiuchi, F. Yoshida, 2nd Edition, Wiley-VCH.

Faculty (& Department or Academic Unit):	Faculty of Engineering Chemical & Materials Engineering
Contact Person:	Prof. Anthony Yeung (tony.yeung@ualberta.ca) Associate Dean, Undergraduate Studies
Level of change: (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate <hr/> <ul style="list-style-type: none"> • Graduate
For which term will this change take effect?	Fall 2024 onwards

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

This course is proposed as a core course in the final year (Term 8) of the proposed Option "[Bachelor of Science in Chemical Engineering– Bioprocessing & Biomanufacturing Option](#)". The course is designed to provide knowledge base on bioreactors including design and analysis of biocatalytic systems. In addition, concepts of metabolic and enzyme engineering have been incorporated to prepare our students for career opportunities in diverse streams including pharmaceuticals, gene therapy, biochemical technology development, and quality control practices.

Course Template

Current:	Proposed:
	<p>Subject & Number: CH E 581 Title: Biocatalysis and Bioreactors Course Career: Undergraduate Units: 3.5 Approved Hours 3-1s-0 Fee index: 6 Faculty: Engineering Department: Chemical & Materials Engineering Typically Offered: either term or Spring/Summer</p> <p>Description</p> <p>Analysis and design of bioreactors. Characterization, Mechanisms and models of biocatalysis by cultures, whole cells and enzymes. Design and modification of biocatalytic systems. Introduction to the concepts of metabolic and enzyme engineering. Lab or simulated lab component.</p> <p>Prerequisites: CME 265 and BIOL 107</p>

Reviewed/Approved by:

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

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

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

Supporting Information

Learning Outcomes

1. Differentiate various types of biocatalytic systems (enzymatic, whole-cell, mixed cultures).
2. Model reaction kinetics for biological systems (enzymatic, whole-cell, mixed cultures).
3. Differentiate among major types of bioreactors (batch, chemostat, fed-batch, perfusion), their operating principles, and their respective context for application.
4. Differentiate between aerobic and anaerobic systems.
5. Apply fundamental concepts of chemical reaction engineering in the context of bioreactors.
6. Analyze, optimize, and design bioreactors for enzymatic and whole-cell systems of reactions.
7. Evaluate the impact of heat and mass transfer on the performance of bioreactors (e.g., oxygen transfer, substrate dissolution, simultaneous saccharification and fermentation).
8. Evaluate the performance of immobilized enzymatic or whole-cell systems.
9. Identify the major metabolic pathways linked to bioconversion and energy generation
10. Explain the principles and parameters guiding enzyme engineering studies.

Relationship of Learning Outcomes and Graduate Attributes

Learning Outcome	Graduate Attribute	Instructional Level
1	Knowledge Base in Engineering	Developed
2	Knowledge Base in Engineering	Developed
3	Knowledge Base in Engineering Investigation	Developed
4	Knowledge Base in Engineering	Developed
5	Investigation	Applied
6	Problem Analysis Investigation Design	Applied
7	Problem Analysis Investigation	Applied
8	Investigation	Applied
9	Knowledge Base in Engineering	Developed
10	Knowledge Base in Engineering	Developed

Assessments of Learning Outcomes

Learning Outcome	Assessments/Activities
1–10	Assignments, Quizzes, Midterm Exam, and Final Exam

Accreditation Units

AU Category	Linked to which learning outcome	Percentage of course content ¹
Math		
Natural Sciences		
Engineering Science	1–5, 8–10	84.1%
Engineering Design (requires PEng)	6, 7	15.9%
Complementary studies		
Other		

¹ Accreditation unit (AU) calculation –

- Total Lecture hours = course lecture hours as per calendar description x 12.6 weeks = X
- Total Seminar hours = course seminar hours as per calendar description x 12.6 weeks = Y
- Total Lab hours = course lab hours as per calendar description x 12.6 weeks = Z

Total course hours = X+Y+Z = TCH

Total AUs in a course $AU_{total} = 12.6 \times (X + \frac{1}{2} Y + \frac{1}{2} Z)$

Number of hours (lecture, seminar, lab) spent on teaching and doing examples of accreditation category "i", is H_i where subscript, i, is for the number total hours spent in course for either Math (M), Engineering Design (ED), Natural Sciences (NS), Engineering Science (ES), Complementary studies (CS), or Other (O)

Percentage course content in AU category i, is: $\%_i = H_i/TCH$

Accreditation unit for category i, is: $A_i = AU_{total} \times \%_i$

Final Course AUs

Total	Math	NS	ES	ED	CS	Other
44.1	-	-	37.1	7	-	-

Proposed Grading criteria (subject to change pending Instructor course modification)

The breakdown of the assessments included in this course is found in the table below.

Component	Percentage
Assignments (Max. 5)	10%
Quizzes (Max. 3)	10%
Midterm Exam	30%
Final Exam (Written)	50%
Total	100%

Unexcused absence from Midterm Examination will result in 0 out of 30%. With legitimate excuse, the Midterm weight will be carried over to the Final (i.e., Final Exam will be worth 80% of the overall grade).

Recommended Textbooks:

1. Chemical Reaction Engineering (1998) O. Levenspiel, 3rd Edition, Wiley.
2. Biocatalysts and Enzyme Technology (2012) K. Buchholz, V. Kasche, U. T. Bornscheuer, 2nd Edition, Wiley.

Faculty (& Department or Academic Unit):	Faculty of Engineering Chemical & Materials Engineering
Contact Person:	Prof. Anthony Yeung (tony.yeung@ualberta.ca) Associate Dean, Undergraduate Studies
Level of change: (choose one only) [?]	<ul style="list-style-type: none"> • Undergraduate • Graduate
For which term will this change take effect?	Fall 2024 onwards

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 course "[Design in Bioengineering](#)" is listed as a Program & Technical (Engineering) Elective course in the proposed Option "[Bachelor of Science in Chemical Engineering– Bioprocessing & Biomanufacturing Option](#)". This course is designed to illustrate the applicability of tools and innovative approaches, such as bioinformatics, artificial intelligence, in biotechnology and bioengineering.

Course Template

Current:	Proposed:
	<p> Subject & Number: CH E 583 Title: Design in Bioengineering Course Career: Undergraduate/Graduate Units: 3.5 Approved Hours 3-0-1 Fee index: 6 Faculty: Engineering Department: Chemical & Materials Engineering Typically Offered: either term or Spring/Summer </p> <p> Description Exploration of how design principles are implemented in biotechnology and bioengineering. Topics cover all scales of bioengineering from processes to cells and biomolecules, and include how tools and innovative approaches, such as bioinformatics and artificial intelligence, influence the field. </p>

Reviewed/Approved by:

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

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering: **September 26, 2023**

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

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

Supporting Information

Learning Outcomes

1. Distinguish between prototyping and engineering design principles in the development of technologies and processes.
2. Identify the engineering design practices used in the development of biotechnologies and bioprocesses.
3. Apply concepts of design within cellular and genetic systems.
4. Model sets of reactions in the context of metabolic pathways and metabolic engineering.
5. Differentiate and implement directed evolution and adaptive evolution strategies for improved biological system
6. Establish principles and practices for the implementation of artificial intelligence and machine learning for the improvement of bioengineering systems.
7. Evaluate the impact of design constraints (technological, economic, safety, environmental, regulatory) on biotechnologies and bioprocesses.
8. Integrate engineering design principles in biotechnologies and bioprocesses.
9. Critically assess design decisions made in the development of biotechnologies and bioprocesses.
10. Identify, evaluate, and establish ethical and safety concerns linked to the development of bio-based technologies.
11. Establish design concepts for the development of biotechnologies and bioprocesses

Relationship of Learning Outcomes and Graduate Attributes

Learning Outcome	Graduate Attribute	Instructional Level
1	Knowledge Base in Engineering	Developed
2	Knowledge Base in Engineering Investigation	Developed
3	Investigation Design	Applied
4	Problem Analysis Investigation Design	Applied
5	Knowledge Base in Engineering	Developed
6	Knowledge Base in Engineering	Developed

7	Problem Analysis Investigation Design Economics Impact of Engg on Environment	Applied
8	Investigation Design	Applied
9	Investigation Design Life-long learning	Applied
10	Investigation Design Ethics	Applied
11	Investigation Design	Applied

Assessments of Learning Outcomes

Learning Outcome	Assessments/Activities
1–11	Assignments, Quizzes, Midterm Exam, and Final Exam
6–11	Design Project

Accreditation Units

AU Category	Linked to which learning outcome	Percentage of course content ¹
Math		
Natural Sciences		
Engineering Science	1–7	56.3%
Engineering Design (requires PEng)	8–11	43.7%
Complementary studies		
Other		

Final Course AUs

Total	Math	NS	ES	ED	CS	Other
44.1	-	-	24.8	19.3	-	-

¹ Accreditation unit (AU) calculation –

- Total Lecture hours = course lecture hours as per calendar description x 12.6 weeks = X
- Total Seminar hours = course seminar hours as per calendar description x 12.6 weeks = Y
- Total Lab hours = course lab hours as per calendar description x 12.6 weeks = Z

Total course hours = X+Y+Z = TCH

Total AUs in a course $AU_{total} = 12.6 \times (X + \frac{1}{2} Y + \frac{1}{2} Z)$

Number of hours (lecture, seminar, lab) spent on teaching and doing examples of accreditation category "i", is H_i where subscript, i, is for the number total hours spent in course for either Math (M), Engineering Design (ED), Natural Sciences (NS), Engineering Science (ES), Complementary studies (CS), or Other (O)

Percentage course content in AU category i, is: $\%_i = H_i/TCH$

Accreditation unit for category i, is: $A_i = AU_{total} \times \%_i$

Proposed Grading criteria (subject to change pending Instructor course modification)

The breakdown of the assessments included in this course is found in the table below.

Component	Percentage
Assignments/Quiz (Max. 5)	10%
Midterm Exam	25%
Design Project	25%
Final Exam (Written)	40%
Total	100%

Unexcused absence from Midterm Examination will result in 0 out of 30%. With legitimate excuse, the Midterm weight will be carried over to the Final (i.e., Final Exam will be worth 80% of the overall grade).

**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"/>	Substantive program changes that do not require Ministry approval

1: Basics		
Program/Specialization/ Combined Degree Name	Bioprocessing & Biomanufacturing Option	
Faculty/Department	Faculty of Engineering/ Chemical and Materials Engineering	
Contact information	Name and Title	Prof. Anthony Yeung, Associate Dean, Undergraduate Studies
	Phone	
	Email	tony.yeung@ualberta.ca
Proposed effective date	July 1, 2024	
Attachments		
<ul style="list-style-type: none"> ● Letter of Support from the Dean of the Faculty ● Proposed Calendar changes <ul style="list-style-type: none"> - Course sequence (traditional and co-op sequences) 		

- Addition of new courses – (a) CH E 583 “Design in Bioengineering” (b) CH E 581 “ Biocatalysis and Bioreactors”
- Change in course description CH E 484 “Introduction to Biochemical Engineering”

2: Rationale, Implications, and Impacts

Rationale for the Proposal

Identify the purpose of the proposal with supporting rationale and evidence of demand.

The Chemical Engineering Program at University of Alberta is considered by some to be aligned primarily to the oil and gas industries. This perception has led to a drop in interest, especially in light of oscillating energy prices and challenges related to emissions. Furthermore, the recent pandemic and the response to it has fueled an interest in Biomanufacturing and Bioprocesses.

Both federal and provincial governments have shown interest in developing Canadian manufacturing of biopharmaceuticals and vaccines. A rapid increase in the number of industrial and research stakeholders in the field of Bioprocess Engineering and Biomanufacturing has been experienced in recent years. Considering the advancements in the research and development facilities, investors are moving toward Alberta for their investments in bioprocessing industries¹. This will provide employment opportunities for graduates to work in industries that use biochemical processes, such as food and brewing process engineering, wastewater treatment, pharmaceutical industries, algae growth for GHG emission control, and processes that involve enzymes or microorganisms and fermentation, including emerging biomass and biofuel industries.

The proposed option is distinctly different from the existing Biomedical Engineering Program Option (which can run independently) in the Faculty of Engineering. The Biomedical Engineering Option focuses significantly on human anatomy and physiology, whereas our proposed Option *Bioprocessing & Biomanufacturing* focuses on the process design for product manufacturing using living cells or their components. Thus, graduates will still be able to utilize all the traditional Chemical Engineering fundamentals to understand and engineer bioreactors, design bioprocesses and genetic engineering strategies, and develop innovating biochemical technologies with industrial applications. In addition, the program also prepares students for work in traditional chemical/oil industries.

Length of the Program

4 years (Traditional Sequence) : Total credit units 159.5*
 Credit units in Year 1: 40.6
 Credit units in Year 2: 42.1

¹ [Alberta for Biotech Investments](#)

Identify the length of the program in years and credit units per year.	<p>Credit units in Year 3: 40.3 Credit units in Year 4: 36.5 5 years (Co-op Sequence): Total Credit Units 166* Credit units in Year 1: 40.6 Credit units in Year 1: 44.1 Credit units in Year 3: 40.8 Credit units in Year 4: 20.5 Credit units in Year 5: 20</p> <p>Length of the program with number of core courses, electives, and credit units per year are given in Appendix A.</p> <p>*Credit units of the traditional and co-op sequences of the proposed Option are consistent with those of the Chemical Engineering Program (159.5 and 166, respectively).</p>
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Provide the anticipated enrolments by head count for the next 5 years (including traditional and co-op sequences)

Enrolment	20XX	20XX	20XX	20XX	20XX
Total Headcount	50	100	160	240	270
• Year 1	50	50	60	80	80
• Year 2	0	50	50	60	80
• Year 3	0	0	50	50	60
• Year 4	0	0	0	50	50

<p>Work-Integrated Learning Describe how learners in this program will have access to Work-Integrated Learning (see CEWIL definitions).</p>	<p>Work-integrated learning is a unique dimension offered in the Co-op sequence of the proposed Option, which is not offered in competitive programs running in other universities.</p> <p>In addition, experiential learning is included in the program structure through a series of design-focused courses wherein students will be working on open-ended design problems.</p>
<p>Consultation Describe the consultation process that occurred with students and other relevant</p>	<p>Please refer to Appendix B for consultation records.</p> <p>Based on the consultations, we believe this Option could be a valuable addition to our program attracting more students who are interested in</p>



<p>stakeholders, and the feedback received.</p>	<p>biomanufacturing and biochemical approaches in the context of chemical engineering.</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>Indigenous perspectives will be woven throughout the curriculum in a meaningful way and an Indigenization Strategy, consistent with the template being developed for the Faculty of Engineering, is being developed.</p> <p>A new component is being added to the content of CME 200 (Introduction to Chemical and Materials Engineering) to acknowledge the impact engineering has had and will continue to have on Indigenous people in the context of resource development and applications of engineering design. Guest speakers from Indigenous communities, who are chemical/biochemical engineers or have been impacted by the chemical engineering projects, in different ways, will be invited to share their experiences.</p> <p>Indigenization component will be introduced in CME 481 (Colloquium I) to weave a variety of Indigenous worldviews, histories, and perspectives into the program.</p> <p>Design projects and case studies that feature the connection to land, northern climates, and Indigenous communities will be incorporated. In addition, Indigenous-led businesses/communities will be engaged as partners in Capstone design projects.</p> <p>Students in the Co-op sequence of the proposed Option will be asked to complete an online asynchronous course, <i>Indigenous Canada Massive Open Online Course (MOOC)</i>, offered by the Faculty of Native Studies, in order to receive credit for WKEXP 905. Students will be encouraged to complete the online course during their first 8-month work term (WKEXP 901/902). The Faculty of Engineering will work to ensure that students can take the course and provide evidence of completion at zero or only a marginal additional cost to the student. This course is an important resource to understand Indigenous ways of knowing, outline decolonization, and close the knowledge gap around racism, historical and contemporary Indigenous experiences and the foundational agreements.</p>
<p>Equity, Diversity and Inclusion Perspectives Describe the outcomes of the consultation with the Vice-Provost (Equity, Diversity and Inclusion) regarding how the</p>	<p>The most current best practices in equity, diversity and inclusion are incorporated into the core part of the program and an EDI Strategy, consistent with the template for the Faculty of Engineering, will be developed.</p>

<p>program will integrate/include EDI perspectives and content, and any action items that may result.</p>	<p>The EDI Strategy will include the provision of training in group dynamics and decision-making, including recognizing decision-making biases and implicit biases, incorporating design projects that include the engineering design for developing assistive tools/technologies for people with differing abilities, and engaging organizations and industries with leaders who are from traditionally underrepresented groups in engineering as partners in capstone design projects.</p> <p>Industry, Indigenous, and EDI perspectives will be incorporated in regular program reviews.</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>Currently, three Options (Computer Process Control, Oil Sands Elective, and Biomedical), in addition to the core Chemical Engineering, appear in the University Calendar for the Undergraduate Chemical Engineering Program. All of these Options are offered in traditional and co-op sequences. Furthermore, the core Chemical Engineering Program includes traditional, Co-op Plan I, and Co-op Plan II sequences. Thus, the department offers nine streams in the Chemical Engineering program. Out of these streams, the department is planning to suspend Oil Sands Elective Option, Biomedical Option, and Co-op Plan II sequence. Phasing out these Options and corresponding sequences will eliminate five streams out of nine that are currently offered. Thus, the department will have enough resources required to accommodate the proposed new Option in replacement of the eliminated sequences.</p> <p>The first year of the proposed program Option is a common first year for all students in the Faculty of Engineering and has well-developed support from the Faculties of Science and Arts. The implementation of this program does not introduce specialized teaching needs to any of the approved Complementary Studies electives or Impact of Technology on Society (ITS) electives.</p> <p>Many of the required core courses are already taught at the Chemical and Materials Engineering and other Faculties at University of Alberta. A few courses from other Faculties are offered as recommended electives. Since this Option involves involvement from other Faculties, we have already consulted with them on the feasibility of accommodating our students to their courses and labs. Consultation records are listed in Appendix B. New additional labs and fermentation reactors will be set up in our Department. Furthermore, additional advisors/companies for the design courses will be identified.</p>



Approval Process

Indicate the internal governance path, including meeting dates

Department Council: **August 17, 2022**

Faculty Academic Planning Committee (F-APC): **June 21, 2023**

Engineering Coordinating Committee (ECC), Faculty of Engineering:
September 26, 2023

Program Support Team (PST): **September 28, 2023**

- GFC Programs Committee (GFC-PC): **(TBD)**
- GFC Academic Planning Committee (GFC-APC): **(TBD)**

Appendix A: Number of core courses, electives, and credit units

Appendix A.1: Sequence of courses in the traditional Chemical Engineering program and the proposed changes in the Option “*Bioprocessing and Biomanufacturing*”.

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	P&T Elective
MATH 209	STAT 235	P&T Elective ²	ENG M 310/401	CS Electives	P&T Elective
CS Elective ³	ITS Elective ⁴		ENGG 404	P&T Elective	
CS Elective					

Figure 1: Sequence of courses in the traditional Chemical Engineering Program

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	CH E 484
MATH 209	STAT 235	P&T Elective	ENG M 310/401	CS Electives	CH E 581
CS Elective	BIOL 107		ENGG 404	P&T Elective	P&T Elective
ITS Elective	ITS Elective				P&T Elective
CS Elective					

Figure 2: Sequence of courses in the proposed Option (■: Course Rearrangement; ■: Course Addition; ■: Course Withdrawal)

² The proposed Option adds three *Program and Technical (P&T) electives* in the list of P&T electives offered in the traditional CH E program.

³ List of *Complementary Studies (CS) electives* offered in the proposed option is the same as offered in the traditional CH E program.

⁴ List of *Impact of Technology on Society (ITS) Elective* in the proposed option is the same as offered in the traditional CH E program.



- I. The proposed Option is primarily based on the Traditional Chemical Engineering curriculum that is enhanced and modified by including five courses (**three core courses (CH E 581 Biocatalysis and Bioreactor, CH E 484 Introduction to Biochemical Engineering, and BIOL 107 An Introduction to Cell Biology), one new Program & Technical (Engg) elective (CH E 583 Design in Bioengineering), and one Program & Technical (Sci) elective (one of BIOCH 200 or MICRB 265)**) to provide strong foundation in biology, biochemistry, and biotechnological processes and equipment.

- II. The proposed Option does not eliminate any core Chemical Engineering courses that are currently offered in the traditional CH E program to include new courses in this Option. Figures 1 and 2 provide the sequence of courses in the Traditional Chemical Engineering program and the proposed Option, respectively. All undergraduate students in the Faculty of Engineering have the same qualifying Year 1; therefore, the sequence of courses offered in Year 1 is not shown here. Notably, the Fall session in Year 2 includes CME 200 which is offered in a single day asynchronously. Furthermore, addition of BIOL 107 as a core course in the junior years is intended to facilitate students with a strong foundation in biological sciences before proceeding to the chemical engineering applications of biological concepts.

Appendix A.2: Program structure including core courses, electives, and credit units per year.

Table 1: Program Structure - [Traditional Sequence](#)

Component	(1 st year) (maximum)	Credits	(2 nd year) (maximum)	Credits	3 rd Year (minimum)	Credits	4 th year (minimum)	Credits
Core courses ⁵	12	40.6	11	36.1	10	37.3	9	30
Program & Technical electives	-	-	-	-	1	3	1	3.5
Complementary Studies elective	-	-	1	3	-	-	1	3
ITS (<i>Impact of Technology on Society</i>) elective	-	-	1	3	-	-	-	-
Total	12	40.6	13	42.1	11	40.3	11	36.5

⁵ One of the core courses, CME 200 (Introduction to Chemical and Materials Engineering), is offered in a single day asynchronously. Thus, practically offered core courses with respect to students' workload are 22 in junior years.

Table 2: Program Structure - [Co-op Sequence](#)

Component	(1 st year) (maximum)	Credits	(2 nd year) (maximum)	Credits	3 rd Year (minimum)	Credits	4 th year (minimum)	Credits	5 th Year (minimum)	Credits
Core courses	12	40.6	12	37.6	10	37.3	4	13	5	17
Program & Technical electives	-	-	-	-	1	3	1	3.5	-	-
Complementary Studies elective	-	-	1	3	-	-	1	3	-	-
ITS (<i>Impact of Technology on Society</i>) elective	-	-	1	3	-	-	-	-	-	-
Work Integrated Learning	-	-	1	0.5	1	0.5	2	1	1	3
Total	12	40.6	15	44.1	12	40.8	8	20.5	6	20

Appendix-A.3

Term-by-term proposed course sequence

Traditional Sequence (course names, descriptions, credits and prerequisites)

Term -1

CHEM 103 Introductory University Chemistry I

4.3 (fi 6) (either term, 3-1s-3/2) Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent.

ENGG 100 Success in Engineering

1.1 (fi 3) (either term, 1.5-1.5-0/2) An introduction to the Faculty of Engineering, the engineering profession, the skills required for academic success, and the fundamentals of leadership: study and life skills; time management and goal setting; interpersonal skills; career planning; engineering and society including elements of ethics, equity, concepts of sustainable development, environmental stewardship, and public safety.

ENGG 130 Engineering Mechanics

4 (fi 8) (either term, 3-0-2) Equilibrium of planar systems. Analysis of statically determinate trusses and frames. Friction. Centroids and centres of gravity. Forces and moments in beams. Second moments of area. Note: Students in all sections of this course will write a common final examination. Corequisite: MATH 100.

ENGL 199 English for Engineering Students

3 (fi 6) (either term, 3-0-0) This course aims to develop the student's ability to provide effective written and oral information. It will focus on instruction in fundamental writing skills, including building effective sentences and paragraphs, and on learning to communicate clearly across a range of genres and media used in academic and professional contexts, including correspondence and presentations. Students will be introduced to the principles of information gathering, analysis, and citation.

MATH 100 Calculus I

3.5 (fi 6) (either term, 3-0-1) Review of numbers, inequalities, functions, analytic geometry; limits, continuity; derivatives and applications, Taylor polynomials; log, exp, and inverse trig functions. Integration, fundamental theorem of calculus substitution, trapezoidal and Simpson's rules. Prerequisites: Mathematics 30-1 and Mathematics 31.

PHYS 130 Wave Motion, Optics, and Sound

3.8 (fi 6) (either term, 3-0-3/2) Geometrical optics, optical instruments, oscillations, waves, sound, interference, diffraction. Prerequisites: Mathematics 30-1, Mathematics 31, Physics 30. Corequisite: MATH 100 or 113 or 114 or 117 or 134 or 144 or equivalent.

Term-2

CHEM 105 Introductory University Chemistry II

3.8 (fi 6) (either term, 3-0-3/2) Rates of reactions, thermodynamics and equilibrium, electrochemistry, modern applications of chemistry. Prerequisite: CHEM 103.

ENCMP 100 - Computer Programming for Engineers

3.8 (fi 8) (either term, 3-0-1.5) Fundamentals of computer programming with emphasis on solving engineering problems. Structure and syntax of computer programs, variables, data types, data structures, control structures, functions, input/output operations, debugging, software development process.

ENGG 160 - Introduction to Engineering Design, Communication, and Profession

2 (fi 5) (either term or Spring/Summer, 1-0-2) Fundamental design process and theory in a multidisciplinary context. Importance, in engineering design, of communications; team work; the engineering disciplines, career fields; professional responsibilities of the engineer including elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Corequisite ENGL 199.

EN PH 131 - Mechanics

4.3 (fi 6) (either term, 3-1s-3/2) Kinematics and dynamics of particles; gravitation; work and energy; linear momentum; angular momentum; systems of particles; introduction to dynamics of rigid bodies. Prerequisites: MATH 100 or 117, and ENGG 130. Corequisite: MATH 101 or 118.

MATH 101 - Calculus for Engineering II

3.5 (fi 6) (either term, 3-0-1) Area between curves, techniques of integration. Applications of integration to planar areas and lengths, volumes and masses. First order ordinary differential equations: separable, linear, direction fields, Euler's method, applications. Infinite series, power series, Taylor expansions with remainder terms. Polar coordinates. Rectangular, spherical and cylindrical coordinates in 3-dimensional space. Parametric curves in the plane and space: graphing, arc length, curvature; normal binormal, tangent plane in 3- dimensional space. Volumes and surface areas of rotation. Prerequisite: MATH 100.

MATH 102 - Applied Linear Algebra

3.5 (fi 6) (either term, 3-0-1) 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.

Term-3**CH E 243 - Engineering Thermodynamics**

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) An introduction to the first and second laws of thermodynamics. Prerequisites: MATH 101.

CHEM 261 - Organic Chemistry I

3 (fi 6) (either term, 3-0-3) 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.

CME 200 - Introduction to Chemical and Materials Engineering

0.5 (fi 2) (first term, 1 day) Topics of interest to second year Chemical and Materials Engineering students, with special reference to industries in Alberta, including coverage of elements of ethics, [equity, diversity and inclusion \(EDI\)](#), [indigenization](#), concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Offered in a single day during the first week of September.

(Newly added content is highlighted in blue).

CME 265 - Process Analysis

4.5 (fi 8) (either term, 3-0-3) Basic process principles; material and energy balances, transient processes, introduction to computer-aided balance calculations. Prerequisites: ENCOMP 100, MATH 102 and CHEM 105. Corequisites: CH E 243 and MATH 209 or equivalent.



MATH 209 - Calculus for Engineering III

3.5 (fi 6) (either term, 3-0-1) Partial differentiation, derivatives of integrals. Multiple integration using rectangular, cylindrical, and spherical coordinates. Vector Field Theory. Prerequisite: MATH 101. Prerequisite/Corequisite: MATH 102.

ITS Elective (3-0-0)

Complementary Studies Elective (3-0-0)

Term-4

CH E 312 - Fluid Mechanics

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Newtonian and non-Newtonian fluid behavior; hydrostatics; buoyancy, application of Bernoulli and momentum equations; frictional losses through pipes, ducts, and fittings; pipe networks; pumps; drag on submerged bodies and flow through porous media. Prerequisites: CH E 243 EN PH 131 and MATH 209. Corequisite: MATH 201.

ECE 209 - Fundamentals of Electrical Engineering

3.8 (fi 8) (either term or Spring/Summer, 3-0-3/2) Physical concepts of passive circuit elements, Kirchhoff's laws and DC circuit equations. Energy concepts, time domain analysis of AC circuits. Impedance, complex numbers and phasor algebra. AC power concepts, resonance, three phase circuits, introduction to machines. Credit may be obtained in only one of ECE 209, E E 239, ECE 202, or E E 240, unless approved by the Department.

MATH 201 - Differential Equations

3.5 (fi 6) (either term or Spring/Summer, 3-0-1) First-order equations; second-order linear equations: reduction of order, variation of parameters; Laplace transform; linear systems; power series; solution by series; separation of variables for PDEs. Prerequisite or corequisite: MATH 209 or 214.

MAT E 202 - Materials Science II

3.5 (fi 8) (either term or Spring/Summer, 3- 1.5s/2-1/3) An introduction to the science of materials relating their mechanical, thermal, electronic, and chemical properties to atomic, molecular, and crystal structure. Ceramic and metallic crystals, glasses, polymers, and composite materials. Multi-phase materials, phase transformations, and strengthening processes. Laboratories and seminars include mechanical properties of materials, microstructure, heat treatment of steel, and hands on design experiments. Prerequisite: CHEM 105 or consent of Department.

STAT 235 - Introductory Statistics for Engineering

3.8 (fi 6) (either term or Spring/Summer, 3-0-1.5) Descriptive data analysis. Calculus of Probability. Binomial, multinomial, Poisson, normal, beta, exponential, gamma, hypergeometric, and Weibull distributions. Sampling distributions. Estimation, testing hypotheses, goodness-of-fit tests, and one-way analysis of variance. Linear correlation and regression. Sampling. Quality control. Use of a microcomputer software package for statistical analyses in engineering applications. Prerequisite: MATH 100. Corequisite: MATH 101.

BIOL 107 - An Introduction to Cell Biology ([Currently offered in the Faculty of Science](#))

3 (fi 6) (either term, 3-0-3) 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.

Term 5

CH E 314 - Heat Transfer

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Principles of conduction, convection and radiation heat transfer. Design and performance analysis of thermal systems based on these principles. Prerequisites: MATH 201, CH E 312. Corequisite CH E 374.

CH E 343 - Chemical Engineering Thermodynamics

3.5 (fi 8) (either term, 3-1s-0) Thermodynamics of non-ideal gases and liquids; vapour-liquid equilibrium, thermodynamics of chemical processes and multicomponent systems. Prerequisite: CH E 243. Corequisite: CME 265.

CH E 351 - Chemical Engineering Laboratory

3.5 (fi 8) (either term, 2-0-3) Technical report writing; thermodynamics, material, and energy balances, and calibration experiments. Prerequisites: ENGL 199 or equivalent, CME 265 and CH E 243. Corequisite: CH E 312.

CH E 374 - Computational Methods in Engineering

3.5 (fi 8) (either term, 3-1s-0) Formulation and solution of chemical and materials engineering problems; solution of systems of linear and nonlinear algebraic equations; numerical interpolation, differentiation and integration; numerical solution of ordinary and partial differential equations. Prerequisites: ENCMP 100 (or equivalent). MATH 102, 201 and 209.

Program & Technical (Science) Elective (Currently Offered by Faculty of Science)

Term 6

CH E 316 - Equilibrium Stage Process

4 (fi 8) (either term or Spring/Summer, 3-0-2) Design of separation processes with emphasis on the equilibrium stage concept, distillation, absorption and extraction. Prerequisites: CH E 343, 314. Corequisite: CH E 318.

CH E 318 - Mass Transfer

4 (fi 8) (either term or Spring/Summer, 3-0-2) Molecular and turbulent diffusion; mass transfer coefficients; mass transfer equipment design including absorption and cooling towers, adsorption and ion exchange. Prerequisites: CME 265, CH E 312 and 343. Corequisite: CH E 314

CH E 345 - Chemical Reactor Analysis I

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Kinetics of chemical reactions and design of ideal chemical reactors. Prerequisites: CME 265, CH E 343 and 374.

CH E 358 - Process Data Analysis

5 (fi 8) (either term or Spring/Summer, 3-0-4) Statistical analysis of process data from chemical process plants and course laboratory experiments. Topics covered include least squares regression, analysis of variance, propagation of error, and design of experiments. Prerequisites: CH E 351 and STAT 235. Corequisites: CH E 314 and 345.

ENG M 310 - Engineering Economy

3 (fi 8) (either term or Spring/Summer, 3-0-0) The application of the fundamentals of economics to engineering alternatives in planning, developing and managing industrial projects.

OR

ENG M 401 - Financial Management for Engineers

3 (fi 8) (either term, 3-0-0) Application of the fundamentals of engineering economics, financial analysis and market assessment to engineering alternatives in the planning, development and ongoing management of industrial enterprises. The course covers the use of engineering, economic, financial and market assessment information in investment and business operation decisions in technology oriented companies.

ENGG 404 - Engineering Safety and Risk Management-Leadership in Risk Management

3.8 (fi 8) (either term or Spring/Summer, 3-3s/2-0) Basic concepts of risk and consequences of loss incidents; risk management principles and practices; incident investigation, causation, root cause analysis; process safety management; the roles of government agencies, professional bodies and industry associations; workplace safety; risk-based decision-making processes; leadership and the human-factors side of risk management. The course focuses on the principles and practices of leadership towards the effective application and implementation of risk management in major organizations across all engineering disciplines. Industry virtual tours, case studies, seminars and team projects specific to the student's engineering program will be used to develop competencies and proficiencies in applying leadership and organizational effectiveness for successful risk management.

Term 7**CH E 445 - Chemical Reactor Analysis II**

3.5 (fi 8) (either term, 3-1s-0) Analysis and design of non-ideal chemical reactors for industrial product synthesis. Prerequisites: CH E 314, 318 and 345.

CH E 446 - Process Dynamics and Control

4 (fi 8) (either term, 3-1s-3/3) Introduction to process modeling and transient response analysis; design and analysis of feedback systems; stability analysis; process control applications; process control using digital computers. Prerequisites: CME 265, MATH 201 and 209. Corequisite: CH E 312.

CH E 464 - Chemical Engineering Design I

4.5 (fi 8) (either term or Spring/Summer, 3-0-3) Engineering design concepts; cost estimation; project planning and scheduling; plant safety and hazards analysis; selected project design examples. Prerequisites: CH E 314, 345, 316 or 416, and ENG M 310 or 401. Corequisite: ENGG 404.

CME 481 - Colloquium I

1 (fi 3) (either term, 1-0-0) Communication and oral presentations. Graded on a pass/fail basis. Prerequisite: 85 units completed or consent of instructor.

Complementary Studies Elective (3-0-0)**Program & Technical (Engineering) Elective (3-0-0)****Term 8****CH E 454 - Chemical Engineering Project Laboratory**

3 (fi 8) (second term, 1-0-4) Experiments in kinetics and mass transfer. Prerequisites: CH E 318, 345, 358, and 416.

CH E 465 - Chemical Engineering Design II

6 (fi 8) (second term, 4-0-4) Integration of chemical engineering practice, theory and economics into capital project proposal, sustainable design and evaluation. Course work requires team and project work. Prerequisites: CH E 446, 464, and ENGG 404.

ENGG 400 - The Practice of the Engineering Profession

1 (fi 3) (either term, 1-0-0) The technical and professional duties and responsibilities of the engineer; the ethics of the engineering profession; technical and professional organizations. The role of the engineer in the social environment including elements of equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

CH E 484- Introduction to Biochemical Engineering

(Currently offered as a Program & Technical elective in the department)

3.5 (fi 8) (either term or Spring/Summer, 3-0-1) ~~Physical and chemical properties of cells, tissues, and biological fluids;~~ Engineering analysis or processes such as cell growth and fermentation, purification of products, **waste management and bioremediation** . Prerequisites: CME 265 or BIOL 107.

*(Some of the existing content ~~(red, strikethrough)~~ is proposed to replace with new additions, **highlighted in blue**)*

CH E 581-Biocatalysis and Bioreactor (New)

3.5 (fi 6) (either term or Spring/Summer, 3-1s-0): Analysis and design of bioreactors. Characterization, mechanisms and models of biocatalysis by cultures, whole cells and enzymes. Design and modification of biocatalytic systems. Introduction of concepts of metabolic and enzyme engineering. Lab or simulated lab component.

Prerequisites: CME 265, and BIOL 107 or BIOCH 200 or MICRB 265.

Program & Technical (Science) Electives:

The Engineering Science elective must be selected from:

BIOCH 200 - Introductory Biochemistry (Currently offered in the Faculty of Medicine and Dentistry)

3 (fi 6) (either term, 3-0-0) An introduction to the fundamental principles of biochemistry. Protein structure and function; enzymes; lipids and the structure of biological membranes; nucleotides and the structure of nucleic acids; bioenergetics and the catabolism of carbohydrates. Prerequisites: CHEM 101 and CHEM 261 or 164, or SCI 100.

MICRB 265 - General Microbiology (Currently offered in the Faculty of Science)

3 (fi 6) (either term, 3-0-4) This course will focus on the structure and physiology of free-living and pathogenic bacteria. The diversity of their metabolic activities, the interaction of microbes with their environment, symbiotic relationships and cell-to-cell communication are major topics. Lectures and laboratory exercises are coordinated to explore topics in basic microbiology, environmental microbiology, molecular microbiology, and the production of economically or medically important products through microbial biotechnology. Prerequisites: BIOL 107 and CHEM 164 or 261. SCI 100 may be used in lieu of BIOL 107 and CHEM 261.

Program & Technical (Engineering Science/Engineering Design) Electives:

The one Engineering Science/Engineering Design electives can be either **CH E 583 - Design in Bioengineering (New)** or selected from lists in [Bachelor of Science in Chemical Engineering](#). Other courses may be taken with written permission from the Department **prior** to enrollment. *CME 458 or CME 459 may be taken with an appropriate project approved by the department and the program coordinator.

CH E 583 - Design in Bioengineering (New)

3.5 (fi 6) (either term, 3-0-1) Exploration of how design principles are implemented in biotechnology and bioengineering. Topics cover all scales of bioengineering from processes to cells and biomolecules, and include how tools and innovative approaches, such as bioinformatics, artificial intelligence, influence the field.

Appendix B: Consultation Records

Consultations	Date	Feedback
<p>Students</p> <p>A meeting was held with the representatives from the Chemical Engineering Students' Society (ChESS) and Material Engineering Students' Society (MESS) in August 2021. An outreach survey was developed to gauge the level of interest amongst undergraduate students for different options.</p>	<p>August 2021</p>	<p>The survey results indicate an interest in bioprocesses and biomanufacturing among students, suggesting that students will be open to taking this option in the Chemical Engineering program.</p> <p>(Link)</p>
<p>Industry Support – Genome Alberta</p>	<p>Dec. 23, 2021</p>	<p>Received a letter of support.</p> <p>(Link)</p>
<p>Department Council</p> <p>The proposed program description and structure was presented during Chemical and Materials Engineering departmental council meetings to solicit feedback from colleagues and online voting was conducted.</p>	<p>August 17, 2022</p>	<p>The members of the department council supported the proposed Option and provided constructive feedback. The suggestions were integrated into the curriculum development process for the proposed option.</p> <p>(Link)</p>
<p>Associate Dean, Undergraduate Studies</p>	<p>April 24, 2023</p>	<p>Prof. Pierre Mertiny, Associate Dean for Undergraduate Studies, Faculty of Engineering, reviewed the proposed option and supported our initiative in this field.</p> <p>(Link)</p>
<p>Industry Support – Entos Pharmaceuticals</p>	<p>May 04, 2023</p>	<p>Received a letter of support.</p> <p>(Link)</p>

<p>Provost Office (Carley Roth and Suzanne French)</p>	<p>May 08, 2023</p>	<p>Consultation pathways were suggested that are required to complete the internal program proposal form.</p> <p>(Link)</p>
<p>Faculty of Medicine and Dentistry (BIOCH 200)</p> <p>Possibility of accommodating Chemical and Materials Engineering students in BIOCH 200, offered by the Faculty of Medicine and Dentistry, was consulted with Dr. Adrienne Wright, Faculty Service Officer, Faculty of Medicine & Dentistry - Biochemistry Dept.</p>	<p>May 10, 2023</p>	<p>Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p> <p>(Link)</p>
<p>Faculty of Science (MICRB 265)</p> <p>The possibility of accommodating students in the MICRB 254 courses, which is listed as the program & technical electives in the proposed Option, was discussed with Dr. Maya Evenden, Associate Chair (Undergraduate), Faculty of Science - Biological Sciences.</p>	<p>May 18, 2023</p>	<p>Dr. Evenden suggested that spots cannot be reserved in this class for Chemical Engineering students because the course is listed as elective in this Option and not necessarily required for the completion of undergraduate degree in the proposed Option.</p> <p>(Link)</p> <p>Since students can take these courses in any semester, we are expecting a maximum of 10-15 students in each year who will sign-up for these courses. Based on this information, students will likely be accommodated in the MICRB 265.</p> <p>If the Faculty of Science cannot accommodate students from the proposed Option in MICRB 265, students can still enroll for BIOCH 200. Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p>

<p>Registrar's Office</p> <p>Fee index and course numbers were consulted with Jesse Luyendyk, Assistant Registrar, Enrolment Services, Office of the Registrar - Exams & Timetabling.</p>	<p>June 15, 2023</p>	<p>Received the suggestions regarding fee index and course numbers for new courses.</p> <p>(Link)</p>
<p>Registrar's Office</p> <p>Calendar change requirements were consulted with Rebecca Liaw, University Calendar Editor, Office of the Registrar - Policy Governance Calendar.</p>	<p>June 19, 2023 / June 29, 2023</p>	<p>A few changes related to formatting requirements were suggested in order to make the forms ready for calendar editing. All the suggestions were incorporated in the calendar change request forms. The revised documents were reviewed and approved by Registrar's office.</p> <p>(Link)</p>
<p>Jesse Luyendyk and Carrie Dube,</p> <p>Consulted regarding course scheduling.</p>	<p>June 26, 2023</p>	<p>No scheduling issues were anticipated for second year students taking the new Options in September 2024 (assuming the new Options make the January 2024 calendar).</p>
<p>Centre for Teaching and Learning</p> <p>Anita Parker, Lead Educational Developer, Online and Hybrid Instruction & Strategy</p>	<p>July 06, 2023</p>	<p>Consulted with CTL regarding learning outcomes for new courses.</p> <p>(Link)</p>
<p>Faculty of Science (BIOL 107)</p> <p>Possibility of accommodating Chemical and Materials Engineering students in BIOL 107 (which is a core course in the proposed Option), offered by the Faculty of Science, was consulted with Dr Corwin Sullivan, Associate Professor and Associate Chair, Department of Biological Sciences.</p>	<p>Sep 11, 2023</p>	<p>The Faculty of Science supported the proposed Option and kindly agreed to accommodate our students in BIOL 107 as a core course.</p> <p>(Link)</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	Biomedical Option (under the BSc in Chemical Engineering)	
Faculty/Department	Faculty of Engineering / Chemical and Materials Engineering	
Contact information	Name and Title	Dr. Anthony Yeung, Associate Dean, Undergraduate, Studies.
	Phone	
	Email	tony.yeung@ualberta.ca
Proposed start date of suspension	July 1, 2024	
Proposed end date of suspension	June 30, 2029	



Attachments

- Proposed Calendar changes
- 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 students' enrollment data indicate zero enrollment in this Option since Year 2018. Considering no enrollments in the Biomedical Option, the Department of Chemical and Material Engineering is proposing the suspension of this Option.

Document enrolments by head count for the most recent 5-year period

Enrolment	2018	2019	2020	2021	2022
Total Headcount	0	0	0	0	0
• Year 1	0	0	0	0	0
• Year 2	0	0	0	0	0
• Year 3	0	0	0	0	0
• Year 4	0	0	0	0	0

Rationale for End date

Briefly explain the rationale for the proposed end date for the suspension.

The proposed end date complies with the university norms (*Terminations must be preceded by a period of suspension, typically **five years**.*).

Since we do not have any student currently enrolled in this Option, the Option can also be considered for termination.

Current Students

Describe how active students will be assisted in completing graduation requirements

No students are currently enrolled in this Option.

<p>during the suspension period, as well as information regarding formal communication plans.</p>	
<p>Stop-Out Students Describe how stop-out students will be managed, including information regarding communication plans.</p>	<p>There are no stop-out students who need to be informed that the program is being suspended.</p>
<p>Consultation Briefly describe the consultation process that occurred with students and other relevant stakeholders, and the feedback received.</p>	<p>The suspension of Biomedical Option was proposed during the Departmental council meeting (May 18, 2023) of Chemical and Materials Engineering to solicit feedback from colleagues. All the department council members supported the motion and agreed to the suspension of Biomedical Option.</p> <p>In addition, a consultation with Chemical Engineering Students' Society and an outreach survey (August 2021) was carried out to gauge the level of interest amongst undergraduate students for different Options. The results indicate an inclination towards "<i>Bioprocessing and Biomanufacturing</i>" instead of "Biomedical" Option, suggesting that students will be more interested in taking "<i>Bioprocessing and Biomanufacturing</i>" Option in the Chemical Engineering Program.</p>
<p>Resource Implications Identify relevant financial impact, including reallocation of internal resources.</p>	<p>Internal resources used in the Biomedical Option can be reallocated to the proposed <i>Bioprocessing and Biomanufacturing</i> Option.</p> <p>The proposed <i>Bioprocessing and Biomanufacturing</i> Option is distinctly different from the existing Biomed Option (which can run independently) in the Department of Mechanical Engineering, Faculty of Engineering. The Biomed Option focuses significantly on human anatomy and physiology, whereas our proposed option "<i>Bioprocessing and Biomanufacturing</i>" focuses on the process design for product manufacturing using living cells or their components.</p>
<p>Approval Process Indicate the internal governance path, including meeting dates</p>	<p>Department Council: August 17, 2022</p> <p>Faculty Academic Planning Committee (F-APC): June 21, 2023</p> <p>Engineering Coordinating Committee (ECC), Faculty of Engineering: September 26, 2023</p> <p>Program Support Team (PST): September 28, 2023</p> <ul style="list-style-type: none"> • GFC Programs Committee (GFC-PC): (TBD) • GFC Academic Planning Committee (GFC-APC): (TBD)

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.</p> <p><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</p> <p>Describe the consultation process that occurred with relevant stakeholders.</p>	
<p>Communications</p> <p>Describe plans for communicating the termination decision to relevant stakeholders.</p>	
<p>Resource Implications</p> <p>Describe plans for reallocation of resources previously used for this Specialization/Embedded Certificate.</p>	
<p>Approval Process</p> <p>Indicate the internal governance path, including meeting dates</p>	<p>Department Council (TBD)</p> <p>Engineering Faculty Council (TBD)</p> <p>Program Support Team (PST)</p> <p>GFC Programs Committee (PST)</p>

CURRICULUM MOTION

Program: **Chemical Engineering**

Option: **Bioprocessing & Biomanufacturing**

Proposed By:

**Department of Chemical and Materials Engineering
Faculty of Engineering
University of Alberta**

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Curriculum Motion

Program: Chemical Engineering

Option¹: Bioprocessing & Biomanufacturing

Motivation

The Chemical Engineering Program at University of Alberta is considered by some to be aligned primarily to the oil and gas industries. This perception has led to a drop in interest, especially in light of oscillating energy prices and challenges related to emissions. Furthermore, the recent pandemic and the response to it has fueled an interest in Biomanufacturing and Bioprocesses.

Both federal and provincial governments have shown interest in developing Canadian manufacturing of biopharmaceuticals and vaccines. A rapid increase in the number of industrial and research stakeholders in the field of Bioprocess Engineering and Biomanufacturing has been experienced in recent years. Considering the advancements in the research and development facilities, investors are moving toward Alberta for their investments in bioprocessing industries². This will provide employment opportunities for graduates to work in industries that use biochemical processes, such as food and brewing process engineering, wastewater treatment, pharmaceutical industries, algae growth for GHG emission control, and processes that involve enzymes or microorganisms and fermentation, including emerging biomass and biofuel industries.

The proposed Option is distinctly different from the existing Biomed Program Option (which can run independently) in the Faculty of Engineering. The Biomed Option focuses significantly on human anatomy and physiology, whereas our proposed Option *Bioprocessing & Biomanufacturing* focuses on the process design for product manufacturing using living cells or their components. Thus, graduates will still be able to utilize all the traditional Chemical Engineering fundamentals to understand and engineer bioreactors, design bioprocesses and genetic engineering strategies, and develop innovating biochemical technologies with industrial applications. In addition, students can work in traditional chemical/oil industries as well.

Option Description

Proposed Structure

- I. The proposed Option is primarily based on the Traditional Chemical Engineering curriculum that is enhanced and modified by including five courses (**three core courses (CH E 581 Biocatalysis and Bioreactor, CH E 484 Introduction to Biochemical Engineering, and BIOL 107 An Introduction to Cell Biology), one new Program & Technical (Engg) elective (CH E 583 Design in Bioengineering), and one Program & Technical (Sci) elective (one of BIOCH 200 or MICRB 265)**) to provide strong foundation in biology, biochemistry and biotechnological processes and equipment.

¹ The term "Program" and "Option" refer to primary and secondary specializations, respectively, in Engineering.

² [Alberta for Biotech Investments](#)

- II. The proposed Option does not eliminate any core chemical engineering courses that are currently offered in the traditional CH E program to include new courses in this option. Figures 1 and 2 provide the sequence of courses in the Traditional Chemical Engineering Program and the proposed Option, respectively. All undergraduate students in the Faculty of Engineering have the same qualifying Year 1; therefore, the sequence of courses offered in Year 1 is not shown here. Notably, the Fall session in Year 2 includes CME 200 which is offered in a single day asynchronously. Furthermore, addition of BIOL 107 as a core course in the junior years is intended to facilitate students with a strong foundation in biological sciences before proceeding to the chemical engineering applications of biological concepts.

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	P&T Elective
MATH 209	STAT 235	P&T Elective ³	ENG M 310/401	CS Electives	P&T Elective
CS Elective ⁴	ITS Elective ⁵		ENGG 404	P&T Elective	
CS Elective					

Figure 1: Sequence of courses in the traditional Chemical Engineering Program

Year 2		Year 3		Year 4	
Fall	Winter	Fall	Winter	Fall	Winter
CH E 243	CH E 312	CH E 314	CH E 316	CH E 445	CH E 454
CHEM 261	ECE 209	CH E 343	CH E 318	CH E 446	CH E 465
CME 200	MATH 201	CH E 351	CH E 345	CH E 464	ENGG 400
CME 265	MAT E 202	CH E 374	CH E 358	CME 481	CH E 484
MATH 209	STAT 235	P&T Elective	ENG M 310/401	CS Electives	CH E 581
CS Elective	BIOL 107		ENGG 404	P&T Elective	P&T Elective
ITS Elective	ITS Elective				P&T Elective
CS Elective					

Figure 2: Sequence of courses in the proposed Option (■: Course Rearrangement; ■: Course Addition; ■: Course Withdrawal)

³ The proposed option adds three Program and Technical (P&T) electives in the list of P&T electives offered in the traditional CH E program.

⁴ List of Complementary Studies (CS) electives offered in the proposed option is the same as offered in the traditional CH E program.

⁵ List of Impact of Technology on Society (ITS) Elective in the proposed option is the same as offered in the traditional CH E program.

- **BIOCH 200, and MICRB 265**, which are currently offered in the Faculty of Science, are included as Program & Technical (Science) electives. We have consulted with the Faculty of Science and Faculty of Medicine and Dentistry to explore feasibility for accommodating Chemical and Material Engineering students. Both the faculties have kindly agreed to accommodate our students in these courses. The Faculty of Science suggested that spots cannot be reserved in the class MICRB 265 for Chemical Engineering students because the course is listed as electives in this Option and not necessarily required for the completion of undergraduate degree in the proposed Option. [\(Link\)](#)
- Since students can take these courses in any semester, we are expecting a maximum of 10–15 students in each year who will sign-up for these courses. Based on this information, students will likely be accommodated in the MICRB 265. If the Faculty of Science cannot accommodate students from the proposed Option in MICRB 265, students can still enroll for BIOCH 200. Faculty of Medicine and Dentistry supported the proposed Option and kindly agreed to accommodate our students in BIOCH 200. [\(Link\)](#)
- Estimated increase in the course load for the department is **three courses per year**.
- This option is proposed to be offered in Traditional and Co-op sequences. Work-integrated learning is a unique dimension offered in Co-op sequence, which is not offered in competitive programs running in other universities. Tables 1 and 2 present the structure and total credits for traditional and co-op sequences, respectively, of the proposed option.
- Experiential learning is included in the program structure through a series of design-focused courses wherein students will be working on open-ended design problems.
- Indigenous perspectives are woven throughout the curriculum in a meaningful way. The most current best practices in equity, diversity and inclusion are incorporated into the core part of the program. Industry, Indigenous, and EDI perspectives will be incorporated in regular program reviews.

Table 1: Program Structure of the proposed option - Traditional Sequence

Component	Junior courses (1 st and 2 nd year) (maximum)	Credits	Senior courses (3 rd and 4 th year) (minimum)	Credits
Core courses ⁶	23	73.7	19	67.3
Program & Technical electives	-	-	2	6.5
Complementary Studies elective	1	3	1	3
ITS (<i>Impact of Technology on Society</i>) elective	1	3	-	-
Total	25	82.7	22	76.8

⁶ One of the core courses, CME 200 (Introduction to Chemical and Materials Engineering), is offered in a single day asynchronously. Thus, practically offered core courses with respect to students' workload are 22 in junior years.

Table 2: Program Structure of the proposed option - Co-op Sequence

Component	Junior courses (1 st and 2 nd year) (maximum)	Credits	Senior courses (3 rd , 4 th and 5 th year) (minimum)	Credits
Core courses	24	78.2	19	67.3
Program & Technical electives	-	-	2	6.5
Complementary Studies elective	1	3	1	3
ITS (<i>Impact of Technology on Society</i>) elective	1	3	-	-
Work Integrated Learning	1	0.5	4	4.5
Total	27	84.7	26	81.3

See [Appendix A](#) for a list of the calendar entries for all required courses and specified electives, including the calendar designation for credits and numbers of lecture, lab seminar, and tutorial hours. A tentative calendar entry has been provided for the new courses under development. Curriculum Mapping of the program option is provided in Table A.1. in Appendix A.

Key-Learning Outcomes

- i. Develop innovative technologies with applications in chemical, pharmaceuticals, biochemical, etc. industries by integrating the concepts of bioprocesses, biomanufacturing, and genetic engineering.
- ii. Design processes and equipment for product manufacturing using living cells or their components.
- iii. Understand, plan, design and analyze results from genetic engineering strategies.
- iv. Develop a better understanding of the limitations, challenges, and opportunities in the field, considering both the established and emerging technologies and their points of intersection.
- v. Establish principles and practices for the implementation of artificial intelligence and machine learning for the improvement of bioengineering systems.
- vi. Evaluate the impact of design constraints (technological, economic, safety, environmental, regulatory, etc.) on biotechnologies and bioprocesses.
- vii. Evaluate and compare the technical and economic feasibility of different biomanufacturing systems and bioprocess designs.

Resource Requirements

Estimated increase in the course load for the department: ≈3 courses per year

Currently, three Options (Computer Process Control, Oil Sands Elective, and Biomedical), in addition to the core Chemical Engineering, appear in the University Calendar for the Undergraduate Chemical Engineering Program. All of these Options are offered in traditional and co-op sequences. Furthermore, the core Chemical Engineering Program includes traditional, Co-op Plan I, and Co-op Plan II sequences. Thus, the department offers nine streams in the Chemical Engineering Program. Out of these streams, the department is planning to suspend Oil Sands Elective Option, Biomedical Option, and Co-op Plan II sequence. Phasing out these Options and corresponding sequences will eliminate five streams out of nine

that are currently offered. Thus, the department will have enough resources required to accommodate the proposed new Option in replacement of the eliminated sequences.

The first year of the proposed program Option is a common first year for all students in the Faculty of Engineering and has well-developed support from the Faculties of Science and Arts. The implementation of this Option does not introduce specialized teaching needs to any of the approved Complementary Studies electives or Impact of Technology on Society (ITS) electives.

Many of the required core courses are already taught at the Chemical and Materials Engineering and other Faculties at University of Alberta. A few courses from other Faculties can be offered as recommended electives. Since this Option involves significant involvement from other Faculties, we will consult with them on the feasibility of adding our students to their courses and labs (if required). New additional labs and fermentation reactors will be set up in our Department. Furthermore, additional advisors/companies for the design courses will be identified.

Stakeholder Consultations

Internal Stakeholders

The proposed program description and structure was presented during the Department Council meetings to solicit colleagues' feedback. Based on the consultations from internal stakeholders, we believe this Option could be a valuable addition to our program attracting more students who are interested in biomanufacturing and biochemical approaches in addition to regular chemical engineering. In addition, Prof. Pierre Mertiny, Associate Dean for Undergraduate Studies, Faculty of Engineering reviewed the proposed option and supported our initiative in this field.

(See [Appendix B](#) for the feedback received from the Department Colleagues.)

We have received the approval from Faculty Academic Planning Committee (June 21, 2023) for the proposed Option.

Students/Learners

In addition, a meeting was held with the representatives from the Chemical Engineering Students' Society (ChESS) and Material Engineering Students' Society (MESS) in August 2021. An outreach survey was developed to gauge the level of interest amongst undergraduate students for different options. The survey results indicate an interest in bioprocesses and biomanufacturing among students, suggesting that students will be open to taking this option in the Chemical Engineering program.

(See [Appendix C](#) for the student survey document and feedback received from students.)

Industry Stakeholders

A rapid increase in the number of industrial and research stakeholders in the field of Bioprocess Engineering and Biomanufacturing (both locally and globally) has been a key motivation for offering this option in the Chemical Engineering program. Meaningful engagement with industry stakeholders will be critical in understanding the needs of industry and ensure the relevance of the program from industrial perspectives. We are meeting and sharing information regarding this proposed option with our industrial stakeholders and inviting their feedback to ensure that the proposed option offers the knowledge and

skills required by industry. We have received a letter of support from Genome Alberta and Entos Pharmaceuticals ([Appendix D](#)).

Indigenization Strategies

Indigenous perspectives are woven throughout the curriculum in a meaningful way and an Indigenization Strategy, consistent with the template for the Faculty of Engineering, is being developed .

For example, a new component is being added to the content of CME 200 (**Introduction to Chemical and Materials Engineering**) to acknowledge the impact engineering has had and will continue to add on Indigenous people in the context of resource development and applications of engineering design. Guest speakers from Indigenous communities, who are chemical engineers or have been impacted by the chemical engineering projects in different ways, will be invited to share their experiences.

Equity, Diversity, and Inclusion (EDI) Strategies

The most current best practices in Equity, Diversity and Inclusion are incorporated into the core part of the program and an EDI Strategy, consistent with the template for the Faculty of Engineering, will be developed.

The EDI Strategy will include the provision of training in group dynamics and decision-making, including recognizing decision-making biases and implicit biases, incorporating design projects that include the engineering design for developing assistive tools/technologies for people with differing abilities, and engaging organizations and industries with leaders who are from traditionally underrepresented groups in engineering as partners in capstone design projects.

Industry, Indigenous, and EDI perspectives will be incorporated in regular program reviews.

Appendix-A: Term-by-term proposed Option structure

Traditional sequence (course names, descriptions, credits and prerequisites)

Term -1

CHEM 103 Introductory University Chemistry I

4.3 (fi 6) (either term, 3-1s-3/2) Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent.

ENGG 100 Success in Engineering

1.1 (fi 3) (either term, 1.5-1.5-0/2) An introduction to the Faculty of Engineering, the engineering profession, the skills required for academic success, and the fundamentals of leadership: study and life skills; time management and goal setting; interpersonal skills; career planning; engineering and society including elements of ethics, equity, concepts of sustainable development, environmental stewardship, and public safety.

ENGG 130 Engineering Mechanics

4 (fi 8) (either term, 3-0-2) Equilibrium of planar systems. Analysis of statically determinate trusses and frames. Friction. Centroids and centres of gravity. Forces and moments in beams. Second moments of area. Note: Students in all sections of this course will write a common final examination. Corequisite: MATH 100.

ENGL 199 English for Engineering Students

3 (fi 6) (either term, 3-0-0) This course aims to develop the student's ability to provide effective written and oral information. It will focus on instruction in fundamental writing skills, including building effective sentences and paragraphs, and on learning to communicate clearly across a range of genres and media used in academic and professional contexts, including correspondence and presentations. Students will be introduced to the principles of information gathering, analysis, and citation.

MATH 100 Calculus I

3.5 (fi 6) (either term, 3-0-1) Review of numbers, inequalities, functions, analytic geometry; limits, continuity; derivatives and applications, Taylor polynomials; log, exp, and inverse trig functions. Integration, fundamental theorem of calculus substitution, trapezoidal and Simpson's rules. Prerequisites: Mathematics 30-1 and Mathematics 31.

PHYS 130 Wave Motion, Optics, and Sound

3.8 (fi 6) (either term, 3-0-3/2) Geometrical optics, optical instruments, oscillations, waves, sound, interference, diffraction. Prerequisites: Mathematics 30-1, Mathematics 31, Physics 30. Corequisite: MATH 100 or 113 or 114 or 117 or 134 or 144 or equivalent.

Term-2

CHEM 105 Introductory University Chemistry II

3.8 (fi 6) (either term, 3-0-3/2) Rates of reactions, thermodynamics and equilibrium, electrochemistry, modern applications of chemistry. Prerequisite: CHEM 103.

ENCMP 100 - Computer Programming for Engineers

3.8 (fi 8) (either term, 3-0-1.5) Fundamentals of computer programming with emphasis on solving engineering problems. Structure and syntax of computer programs, variables, data types, data structures, control structures, functions, input/output operations, debugging, software development process.

ENGG 160 - Introduction to Engineering Design, Communication, and Profession

2 (fi 5) (either term or Spring/Summer, 1-0-2) Fundamental design process and theory in a multidisciplinary context. Importance, in engineering design, of communications; team work; the engineering disciplines, career fields; professional responsibilities of the engineer including elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Corequisite ENGL 199.

EN PH 131 - Mechanics

4.3 (fi 6) (either term, 3-1s-3/2) Kinematics and dynamics of particles; gravitation; work and energy; linear momentum; angular momentum; systems of particles; introduction to dynamics of rigid bodies. Prerequisites: MATH 100 or 117, and ENGG 130. Corequisite: MATH 101 or 118.

MATH 101 - Calculus for Engineering II

3.5 (fi 6) (either term, 3-0-1) Area between curves, techniques of integration. Applications of integration to planar areas and lengths, volumes and masses. First order ordinary differential equations: separable, linear, direction fields, Euler's method, applications. Infinite series, power series, Taylor expansions with remainder terms. Polar coordinates. Rectangular, spherical and cylindrical coordinates in 3-dimensional space. Parametric curves in the plane and space: graphing, arc length, curvature; normal binormal, tangent plane in 3- dimensional space. Volumes and surface areas of rotation. Prerequisite: MATH 100.

MATH 102 - Applied Linear Algebra

3.5 (fi 6) (either term, 3-0-1) 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.

Term-3**CH E 243 - Engineering Thermodynamics**

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) An introduction to the first and second laws of thermodynamics. Prerequisites: MATH 101.

CHEM 261 - Organic Chemistry I

3 (fi 6) (either term, 3-0-3) 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.

CME 200 - Introduction to Chemical and Materials Engineering

0.5 (fi 2) (first term, 1 day) Topics of interest to second year Chemical and Materials Engineering students, with special reference to industries in Alberta, including coverage of elements of ethics, equity, diversity and inclusion (EDI), indigenization, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Offered in a single day during the first week of September.
(Newly added content is highlighted in blue).

CME 265 - Process Analysis

4.5 (fi 8) (either term, 3-0-3) Basic process principles; material and energy balances, transient processes, introduction to computer-aided balance calculations. Prerequisites: ENCOMP 100, MATH 102 and CHEM 105. Corequisites: CH E 243 and MATH 209 or equivalent.

MATH 209 - Calculus for Engineering III

3.5 (fi 6) (either term, 3-0-1) Partial differentiation, derivatives of integrals. Multiple integration using rectangular, cylindrical, and spherical coordinates. Vector Field Theory. Prerequisite: MATH 101. Prerequisite/Corequisite: MATH 102.

ITS Elective -1 (3-0-0) (Currently Offered by Faculty of Science)

Complementary Studies Elective (3-0-0) (Currently Offered by Faculty of Science)

Term-4

CH E 312 - Fluid Mechanics

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Newtonian and non-Newtonian fluid behavior; hydrostatics; buoyancy, application of Bernoulli and momentum equations; frictional losses through pipes, ducts, and fittings; pipe networks; pumps; drag on submerged bodies and flow through porous media. Prerequisites: CH E 243 EN PH 131 and MATH 209. Corequisite: MATH 201.

ECE 209 - Fundamentals of Electrical Engineering

3.8 (fi 8) (either term or Spring/Summer, 3-0-3/2) Physical concepts of passive circuit elements, Kirchhoff's laws and DC circuit equations. Energy concepts, time domain analysis of AC circuits. Impedance, complex numbers and phasor algebra. AC power concepts, resonance, three phase circuits, introduction to machines. Credit may be obtained in only one of ECE 209, E E 239, ECE 202, or E E 240, unless approved by the Department.

MATH 201 - Differential Equations

3.5 (fi 6) (either term or Spring/Summer, 3-0-1) First-order equations; second-order linear equations: reduction of order, variation of parameters; Laplace transform; linear systems; power series; solution by series; separation of variables for PDEs. Prerequisite or corequisite: MATH 209 or 214.

MAT E 202 - Materials Science II

3.5 (fi 8) (either term or Spring/Summer, 3- 1.5s/2-1/3) An introduction to the science of materials relating their mechanical, thermal, electronic, and chemical properties to atomic, molecular, and crystal structure. Ceramic and metallic crystals, glasses, polymers, and composite materials. Multi-phase materials, phase transformations, and strengthening processes. Laboratories and seminars include mechanical properties of materials, microstructure, heat treatment of steel, and hands on design experiments. Prerequisite: CHEM 105 or consent of Department.

STAT 235 - Introductory Statistics for Engineering

3.8 (fi 6) (either term or Spring/Summer, 3-0-1.5) Descriptive data analysis. Calculus of Probability. Binomial, multinomial, Poisson, normal, beta, exponential, gamma, hypergeometric, and Weibull distributions. Sampling distributions. Estimation, testing hypotheses, goodness-of-fit tests, and one-way analysis of variance. Linear correlation and regression. Sampling. Quality control. Use of a microcomputer software package for statistical analyses in engineering applications. Prerequisite: MATH 100. Corequisite: MATH 101.

BIOL 107 - An Introduction to Cell Biology (Currently offered in the Faculty of Science)

3 (fi 6) (either term, 3-0-3) 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.

Term 5

CH E 314 - Heat Transfer

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Principles of conduction, convection and radiation heat transfer. Design and performance analysis of thermal systems based on these principles. Prerequisites: MATH 201, CH E 312. Corequisite CH E 374.

CH E 343 - Chemical Engineering Thermodynamics

3.5 (fi 8) (either term, 3-1s-0) Thermodynamics of non-ideal gases and liquids; vapour-liquid equilibrium, thermodynamics of chemical processes and multicomponent systems. Prerequisite: CH E 243. Corequisite: CME 265.

CH E 351 - Chemical Engineering Laboratory

3.5 (fi 8) (either term, 2-0-3) Technical report writing; thermodynamics, material, and energy balances, and calibration experiments. Prerequisites: ENGL 199 or equivalent, CME 265 and CH E 243. Corequisite: CH E 312.

CH E 374 - Computational Methods in Engineering

3.5 (fi 8) (either term, 3-1s-0) Formulation and solution of chemical and materials engineering problems; solution of systems of linear and nonlinear algebraic equations; numerical interpolation, differentiation and integration; numerical solution of ordinary and partial differential equations. Prerequisites: ENCOMP 100 (or equivalent). MATH 102, 201 and 209.

Program & Technical (Science) Elective (Currently Offered by Faculty of Science)

Term 6

CH E 316 - Equilibrium Stage Process

4 (fi 8) (either term or Spring/Summer, 3-0-2) Design of separation processes with emphasis on the equilibrium stage concept, distillation, absorption and extraction. Prerequisites: CH E 343, 314. Corequisite: CH E 318.

CH E 318 - Mass Transfer

4 (fi 8) (either term or Spring/Summer, 3-0-2) Molecular and turbulent diffusion; mass transfer coefficients; mass transfer equipment design including absorption and cooling towers, adsorption and ion exchange. Prerequisites: CME 265, CH E 312 and 343. Corequisite: CH E 314

CH E 345 - Chemical Reactor Analysis I

3.5 (fi 8) (either term or Spring/Summer, 3-1s-0) Kinetics of chemical reactions and design of ideal chemical reactors. Prerequisites: CME 265, CH E 343 and 374.

CH E 358 - Process Data Analysis

5 (fi 8) (either term or Spring/Summer, 3-0-4) Statistical analysis of process data from chemical process plants and course laboratory experiments. Topics covered include least squares regression, analysis of variance, propagation of error, and design of experiments. Prerequisites: CH E 351 and STAT 235. Corequisites: CH E 314 and 345.

ENG M 310 - Engineering Economy

3 (fi 8) (either term or Spring/Summer, 3-0-0) The application of the fundamentals of economics to engineering alternatives in planning, developing and managing industrial projects.

OR

ENG M 401 - Financial Management for Engineers

3 (fi 8) (either term, 3-0-0) Application of the fundamentals of engineering economics, financial analysis and market assessment to engineering alternatives in the planning, development and ongoing management of industrial enterprises. The course covers the use of engineering, economic, financial and market assessment information in investment and business operation decisions in technology oriented companies.

ENGG 404 - Engineering Safety and Risk Management-Leadership in Risk Management

3.8 (fi 8) (either term or Spring/Summer, 3-3s/2-0) Basic concepts of risk and consequences of loss incidents; risk management principles and practices; incident investigation, causation, root cause analysis; process safety management; the roles of government agencies, professional bodies and industry associations; workplace safety; risk-based decision-making processes; leadership and the human-factors side of risk management. The course focuses on the principles and practices of leadership towards the effective application and implementation of risk management in major organizations across all engineering disciplines. Industry virtual tours, case studies, seminars and team projects specific to the student's engineering program will be used to develop competencies and proficiencies in applying leadership and organizational effectiveness for successful risk management.

Term 7

CH E 445 - Chemical Reactor Analysis II

3.5 (fi 8) (either term, 3-1s-0) Analysis and design of non-ideal chemical reactors for industrial product synthesis. Prerequisites: CH E 314, 318 and 345.

CH E 446 - Process Dynamics and Control

4 (fi 8) (either term, 3-1s-3/3) Introduction to process modeling and transient response analysis; design and analysis of feedback systems; stability analysis; process control applications; process control using digital computers. Prerequisites: CME 265, MATH 201 and 209. Corequisite: CH E 312.

CH E 464 - Chemical Engineering Design I

4.5 (fi 8) (either term or Spring/Summer, 3-0-3) Engineering design concepts; cost estimation; project planning and scheduling; plant safety and hazards analysis; selected project design examples.

Prerequisites: CH E 314, 345, 316 or 416, and ENG M 310 or 401. Corequisite: ENGG 404.

CME 481 - Colloquium I

1 (fi 3) (either term, 1-0-0) Communication and oral presentations. Graded on a pass/fail basis.

Prerequisite: 85 units completed or consent of instructor.

Complementary Studies Elective (3-0-0)

Program & Technical (Engineering) Elective (3-0-0)

Term 8

CH E 454 - Chemical Engineering Project Laboratory

3 (fi 8) (second term, 1-0-4) Experiments in kinetics and mass transfer. Prerequisites: CH E 318, 345, 358, and 416.

CH E 465 - Chemical Engineering Design II

6 (fi 8) (second term, 4-0-4) Integration of chemical engineering practice, theory and economics into capital project proposal, sustainable design and evaluation. Course work requires team and project work.

Prerequisites: CH E 446, 464, and ENGG 404.

ENGG 400 - The Practice of the Engineering Profession

1 (fi 3) (either term, 1-0-0) The technical and professional duties and responsibilities of the engineer; the ethics of the engineering profession; technical and professional organizations. The role of the engineer in the social environment including elements of equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

CH E 484- Introduction to Biochemical Engineering

(Currently offered as a Program & Technical elective in the department)

3.5 (fi 8) (either term or Spring/Summer, 3-0-1) ~~Physical and chemical properties of cells, tissues, and biological fluids,~~ Engineering analysis or processes such as cell growth and fermentation, purification of products, **waste management and bioremediation** . Prerequisites: CME 265 or BIOL 107.

*(Some of the existing content ~~(red, strikethrough)~~ is proposed to replace with new additions, **highlighted in blue**)*

CH E 584-Biocatalysis and Bioreactor (New)

3.5 (fi 6) (either term or Spring/Summer, 3-1s-0): Principles of electrochemistry including physical chemistry of electrolyte solutions, ion transport in solution, ionic conductivity, electrode equilibrium, reference electrodes, electrode kinetics, heat effects in electrochemical cells, electrochemical energy conversion, fuel cells, batteries, supercapacitors, and electrocatalytic systems, electrolytic production of hydrogen.

Program & Technical (Science) Electives:

The one Engineering Science elective must be selected from:

BIOCH 200 - Introductory Biochemistry (Currently offered in the Faculty of Medicine and Dentistry)

3 (fi 6) (either term, 3-0-0) An introduction to the fundamental principles of biochemistry. Protein structure and function; enzymes; lipids and the structure of biological membranes; nucleotides and the structure of nucleic acids; bioenergetics and the catabolism of carbohydrates. Prerequisites: CHEM 101 and CHEM 261 or 164, or SCI 100.

MICRB 265 - General Microbiology (Currently offered in the Faculty of Science)

3 (fi 6) (either term, 3-0-4) This course will focus on the structure and physiology of free-living and pathogenic bacteria. The diversity of their metabolic activities, the interaction of microbes with their environment, symbiotic relationships and cell-to-cell communication are major topics. Lectures and laboratory exercises are coordinated to explore topics in basic microbiology, environmental microbiology, molecular microbiology, and the production of economically or medically important products through microbial biotechnology. Prerequisites: BIOL 107 and CHEM 164 or 261. SCI 100 may be used in lieu of BIOL 107 and CHEM 261.

Program & Technical (Engineering) Electives:

The one Engineering Design elective can be either **CH E 583 - Design in Bioengineering (New)** or selected from lists in [Bachelor of Science in Chemical Engineering](#). Other courses may be taken with written permission from the Department **prior** to enrollment. *CME 458 or CME 459 may be taken with an appropriate project approved by the department and the program coordinator.

CH E 583 - Design in Bioengineering (New)

3 (fi 6.) (either term, 3-0-1) Exploration of how design principles are implemented in biotechnology and bioengineering. Topics cover all scales of bioengineering from processes to cells and biomolecules, and include how tools and innovative approaches, such as bioinformatics, artificial intelligence, influence the field.

*Other courses may be taken as program electives with written permission from the Department and program coordinator.

Table A.1: Curriculum Mapping for the Proposed Program Option

	KB	PA	Inv	Design	Tools	Team	Comm.	Prof.	Impact	Ethics	Econ.	LL
CHEM 103	I		I									
ENGG 100				I			D	I	I	I		I
ENGG 130	A											
ENGL 199							D					
MATH 100	I	I										
PHYS 130	I		I									
CHEM 105	D		D									
ENCMP 100	I	I	I	I	D	I	I	I	I			I
ENGG 160	I	I		I	I	I	I					I
EN PH 131	D	I		I								
MATH 101	D	I										
MATH 102	D											
CH E 243	I	I	I									
CHEM 261	A		D									
CME 200							I	I	I	I		
CME 265	D	D	D	I	I						I	
MATH 209	D		D									
CH E 312	D	D	D		D							
ECE 209	D											
MATH 201	D	D										
MAT E 202	D	D	I	I	I			I	I			
STAT 235	D	D			I							
CH E 314	D	D	D	I	D							
CH E 343	D	D	D	I	D							
CH E 351		D	D		D							
CH E 374	D	D	D	I	D							
CH E 316	D	D	D	D	D							
CH E 318	D	D	I	I	I							
CH E 345	D	D	D	I	D							
CH E 358	D	D	D	I	D							
ENG M 310/401				I	I				I		A	
ENGG 404		D	D			D		D	D	D		
CH E 445	A	D	D	D	D							

CH E 446	A	A	A	D	A							
CH E 464	D	A	A	D	A	A	A	D	D	D	D	D
CME 481							D	D				D
CH E 454		A	A	D	A	A	A	A				D
CH E 465		A	A	A	A	A	A	A	A	A	D	D
ENGG 400							D		D			D
CH E 484 ¹	A	D	D	I								
CH E 584 ^{*,2}	A	D	D	I								

BIOL 107 ³	I		D				D					
BIOCH 200 ⁴												
MICRB 265 ³												
CH E 583 ^{*,5}	A	D	D	D								

Abbreviations: I: Introductory; D: Developing; A: Advanced; KB: Knowledge Base; PA: Problem Analysis; Inv.: Investigation; Tools: Use of Engineering Tools; Team: Individual and Team Work; Comm.: Communication Skills; Prof.: Professionalism; Impact: Impact of Engineering on Society and the Environment; Ethics: Ethics and Equity; Econ.: Economics and Project Management; LL: Life-long Learning

*New courses introduced in the program option "Bioprocessing and Biomanufacturing".

¹Course is currently offered as an elective in Chemical and Materials Engineering.

²CH E 584: Biocatalysis and Bioreactor

³Course is currently offered in the Faculty of Science.

⁴Course is currently offered in the Faculty of Medicine and Dentistry.

⁵CH E 583: Design in Bioengineering

Appendix B: Approval from Internal Stakeholders

CH E Curriculum Program Options: Vote

The respondent's email (null) was recorded on submission of this form.

* Required

1. Email *
2. Please provide your vote for each item *

Mark only one oval per row.

	Support	Oppose	Abstain
1. The department approves the creation of a Chemical Engineering option in Bioprocessing & Biomanufacturing to be offered for both Traditional and Co-op (Plan 1) sequences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The department approves the proposed program structure for the option Bioprocessing & Biomanufacturing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. a.i. New course CH E 5xx: Biocatalysis and Bioreactors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a.ii. New course: CH E 5xx: Design in Bioengineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Voting Results:

Total number of votes: 33

Votes [Support/Oppose/Abstain]

Creation of Bioprocess and Biomanufacturing Option [31/2/0]

Program Structure of Bioprocess and Biomanufacturing Option [31/2/0]

New Course CH E 584: Biocatalysis and Bioreactors [32/1/0]

New Course CH E 583: Design in Bioengineering [32/1/0]

Appendix C: Students' Interest in the Proposed Option

Please select the specializations you're interested in

32 responses

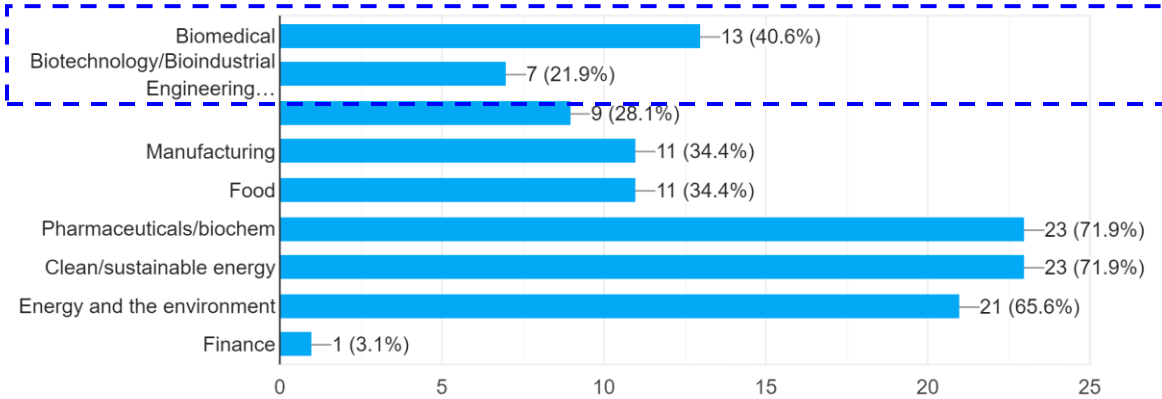


Figure A.1: Students' Interest in the Proposed Option (August 2021)

Appendix D: Consultation Records

Consultations	Date	Feedback
<p>Students</p> <p>A meeting was held with the representatives from the Chemical Engineering Students' Society (ChESS) and Material Engineering Students' Society (MESS) in August 2021. An outreach survey was developed to gauge the level of interest amongst undergraduate students for different options.</p>	August 2021	<p>The survey results indicate an interest in bioprocesses and biomanufacturing among students, suggesting that students will be open to taking this option in the Chemical Engineering program.</p> <p>(Link)</p>
Industry Support – Genome Alberta	Dec. 23, 2021	<p>Received a letter of support.</p> <p>(Link)</p>
<p>Department Council</p> <p>The proposed program description and structure was presented during Chemical and Materials Engineering departmental council meetings to solicit feedback from colleagues and online voting was conducted.</p>	August 17, 2022	<p>The members of the department council supported the proposed Option and provided constructive feedback. The suggestions were integrated into the curriculum development process for the proposed option.</p> <p>(Link)</p>
Associate Dean, Undergraduate Studies	April 24, 2023	<p>Prof. Pierre Mertiny, Associate Dean for Undergraduate Studies, Faculty of Engineering, reviewed the proposed option and supported our initiative in this field.</p> <p>(Link)</p>
Industry Support – Entos Pharmaceuticals	May 04, 2023	<p>Received a letter of support.</p> <p>(Link)</p>
Provost Office (Carley Roth and Suzanne French)	May 08, 2023	<p>Consultation pathways were suggested that are required to complete the internal program proposal form.</p> <p>(Link)</p>

<p>Faculty of Medicine and Dentistry (BIOCH 200)</p> <p>Possibility of accommodating Chemical and Materials Engineering students in BIOCH 200, offered by the Faculty of Medicine and Dentistry, was consulted with Dr. Adrienne Wright, Faculty Service Officer, Faculty of Medicine & Dentistry - Biochemistry Dept.</p>	<p>May 10, 2023</p>	<p>Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p> <p>(Link)</p>
<p>Faculty of Science (MICRB 265)</p> <p>The possibility of accommodating students in the MICRB 254 courses, which is listed as the program & technical electives in the proposed Option, was discussed with Dr. Maya Evenden, Associate Chair (Undergraduate), Faculty of Science - Biological Sciences.</p>	<p>May 18, 2023</p>	<p>Dr. Evenden suggested that spots cannot be reserved in this class for Chemical Engineering students because the course is listed as electives in this Option and not necessarily required for the completion of undergraduate degree in the proposed Option.</p> <p>(Link)</p> <p>Since students can take these courses in any semester, we are expecting a maximum of 10-15 students in each year who will sign-up for these courses. Based on this information, students will likely be accommodated in the MICRB 265.</p> <p>If the Faculty of Science cannot accommodate students from the proposed Option in MICRB 265, students can still enroll for BIOCH 200. Faculty of Medicine and Dentistry supported the proposed option and kindly agreed to accommodate our students in BIOCH 200.</p>
<p>Registrar's Office</p> <p>Fee index and course numbers were consulted with Jesse Luyendyk, Assistant</p>	<p>June 15, 2023</p>	<p>Received the suggestions regarding fee index and course numbers for new courses.</p> <p>(Link)</p>

Registrar, Enrolment Services, Office of the Registrar - Exams & Timetabling.		
Registrar's Office Calendar change requirements were consulted with Rebecca Liaw, University Calendar Editor, Office of the Registrar - Policy Governance Calendar.	June 19, 2023 / June 29, 2023	A few changes related to formatting requirements were suggested in order to make the forms ready for calendar editing. All the suggestions were incorporated in the calendar change request forms. The revised documents were reviewed and approved by Registrar's office. (Link)
Jesse Luyendyk and Carrie Dube, Consulted regarding course scheduling.	June 26, 2023	No scheduling issues were anticipated for second year students taking the new options in September 2024 (assuming the new options make the January 2024 calendar).
Centre for Teaching and Learning Anita Parker, Lead Educational Developer, Online and Hybrid Instruction & Strategy	July 06, 2023	Consulted with CTL regarding learning outcomes for new courses. (Link)
Faculty of Science (BIOL 107) Possibility of accommodating Chemical and Materials Engineering students in BIOL 107 (which is a core course in the proposed Option), offered by the Faculty of Science, was consulted with Dr Corwin Sullivan, Associate Professor and Associate Chair, Department of Biological Sciences.	Sep 11, 2023	The Faculty of Science supported the proposed option and kindly agreed to accommodate our students in BIOL 107 as a core course. (Link)



FINAL ITEM NO. 7

Decision **Discussion** **Information**

DATE	October 12, 2023
TO	Programs Committee
RESPONSIBLE PORTFOLIO	Faculty of Graduate Studies and Research

MOTION:

THAT the GFC Programs Committee recommend that General Faculties Council approve the changes to regulations regarding Graduate Student time in program while on leave, for implementation upon final approval, and inclusion in the 2024-2025 Calendar.

EXECUTIVE SUMMARY:

The proposal contains additions to the Calendar sections that outline time limits to completion for graduate programs. These changes account for two scenarios that affect these limits: regular leave and withdrawal/lapsed program. These changes are proposed for the sake of clarity and to reduce ambiguity.

In the first case, information about regular leaves and time in program is included in the Calendar section on approved leaves of absence. It should also be addressed here, since other kinds of leave of absence are mentioned.

In the second case, this change makes clear what happens when a student has continued to work on their program while not enrolled, either due to accidentally allowing the program to lapse or doing it intentionally as a way of stopping the clock. Withdrawing to prolong the time allowed to complete the program, while continuing to work on it, is not the correct way to add time to the clock. This is the purpose of program extensions and leaves of absence.

This is largely clarification for a small subset of graduate students and programs among whom ambiguity in the Calendar has caused confusion.

Supporting Materials:

1. Calendar Change Request - FGSR Time in Program While on Leave

SCHEDULE A:

GOVERNANCE OUTLINE



Engagement and Routing

Approval Route:

- GPST - March 27, 2023
- PRC - April 6, 2023
- FGSR Council - May 31, 2023 (Discussion)
- FGSR Council - September 13, 2023
- Programs Committee - TBD
- GFC - TBD

Faculty (& Department or Academic Unit):	FGSR
Contact Person:	Andrea Riewe / Roger Epp
Level of change: (choose one only)	<input type="checkbox"/> Undergraduate
	<input checked="" 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

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 proposed changes are intended to reduce ambiguity around whether a student's time away from program when they withdraw or allow their program to lapse is counted towards the total allowable time in program.

Calendar Copy

URL in current Calendar (or "New page") Maintenance of Registration: https://calendar.ualberta.ca/content.php?catoid=36&navoid=11205#maintenance-of-registration	
Current Copy: Removed language	Proposed Copy: New language
Maintenance of Registration	Maintenance of Registration [re-ordered] Students who fail to keep their program registration active as described below will be considered to have withdrawn from their program. If a student has withdrawn from their program or let their program lapse, and then returns to their program, the time away does not count towards their time limit to complete their program. (See: Time Limit for Completion of Graduate Programs). Students who have withdrawn or let their program lapse are not entitled to use university resources, and do not maintain their research ethics approval, (see: Failure to Maintain Active Registration). Course-based Programs: In order to keep their program active, students in course-based degree programs must register in and successfully complete a minimum of 3 units

<p>Course-based Programs: In order to keep their program active, students in course-based degree programs must register in and successfully complete a minimum of 3 units of course weight of coursework for at least one term in each September to August period.</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>Students who fail to keep the program active as described above will be considered to have withdrawn from their program.</p> <p>Thesis-based Programs (Admitted prior to Fall 2011):</p> <p>In order to keep their program active, students in thesis-based master’s and doctoral programs admitted prior to Fall 2011 must register each year in the Fall and Winter Terms.</p> <p>Students who have registered in Fall and Winter Terms and are working only on thesis research during May through August do not need to register for the Spring and Summer Terms.</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>Students who fail to keep the program active as described above will be considered to have withdrawn from their program.</p> <p>Thesis-based Programs (Admitted Fall 2011 and thereafter):</p> <p>In order to keep their program active, students in thesis-based master’s and doctoral programs admitted in Fall 2011 and thereafter must register each year in each consecutive term (Fall, Winter, Spring and Summer).</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>[re-ordered] Students who fail to keep the program active as described above below will be considered to have withdrawn from their program.</p> <p>[...]</p>	<p>of course weight of coursework for at least one term in each September to August period.</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>Students who fail to keep the program active as described above will be considered to have withdrawn from their program.</p> <p>Thesis-based Programs (Admitted prior to Fall 2011):</p> <p>In order to keep their program active, students in thesis-based master’s and doctoral programs admitted prior to Fall 2011 must register each year in the Fall and Winter Terms.</p> <p>Students who have registered in Fall and Winter Terms and are working only on thesis research during May through August do not need to register for the Spring and Summer Terms.</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>Students who fail to keep the program registration active as described above will be considered to have withdrawn from their program.</p> <p>Thesis-based Programs (Admitted Fall 2011 and thereafter):</p> <p>In order to keep their program active, students in thesis-based master’s and doctoral programs admitted in Fall 2011 and thereafter must register each year in each consecutive term (Fall, Winter, Spring and Summer).</p> <p>Other registration patterns for students in exceptional circumstances will be considered by the Faculty of Graduate Studies and Research.</p> <p>[...]</p>
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Time Limit for Completion of Graduate Programs

The time limit (or the maximum period of time permitted to complete the requirements for a degree) is calculated from the start of the term in which the student first registers in that specific program or, if changing program category from another program, the start of the first term of the first program.

Any time spent registered in Maintaining Registration ([M REG 800](#)) is counted in the time limit for completion. Any time spent as a [qualifying graduate student](#) is not counted in the time limit for completion. The time limit for completion of the degree will be extended by the duration of any Faculty of Graduate Studies and Research (FGSR)-approved exceptional, parental or professional [leave of absence](#).

The time limit for completion of a thesis-based degree will be extended if a student has been registered as part-time status at any point in their program. See [Registration Status](#) for further information.

Thesis-based Master's: Candidates must complete their program within four years of the term in which they first register as candidates in the master's program. In the case of students transferring from a course-based or other program, the beginning of the program is the term of initial registration in the first program.

Course-based Master's: Course-based master's students have six years to complete their program unless the department has opted for a shorter time limit for its

Time Limit for Completion of Graduate Programs

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Any time spent registered in Maintaining Registration ([M REG 800](#)) is counted in the time limit for completion. Any time spent as a [qualifying graduate student](#) is not counted in the time limit for completion. The time limit for completion of the degree will be extended by the duration of any Faculty of Graduate Studies and Research (FGSR)-approved exceptional, parental or professional [leave of absence](#). **In contrast, the time away for a Faculty of Graduate Studies and Research (FGSR)-approved Regular leave of absence will be counted towards the time limit for completion.**

The time limit for completion of a thesis-based degree will be extended if a student has been registered as part-time status at any point in their program. See [Registration Status](#) for further information.

If a student has withdrawn from their program or let their program lapse, and then returns to their program, the time away does not count towards their time limit to complete their program. (See: Time Limit for Completion of Graduate Programs). However, students who fail to maintain active registration and then choose to return must apply for readmission, which is not guaranteed (See: [Readmission](#)). If they are readmitted, their time away may be counted towards their time limit for completion or an extension request may be required. (See: [Failure to Maintain Active Registration](#))

In instances where a student has been using University resources while withdrawn or in a lapsed program, FGSR may add appropriate registration and fees, and update time in program to include this period. This would result in the student having to pay full fees and would cost time in program.

Thesis-based Master's: Candidates must complete their program within four years of the term in which they first register as candidates in the master's program. In the case of students transferring from a course-based or other program, the beginning of the program is the term of initial registration in the first program.

Course-based Master's: Course-based master's students have six years to complete their program unless the department has opted for a shorter time limit for its

course-based master's program. In the case of students transferring from a thesis-based or other program, the beginning of the program is the term of initial registration in the first program. Consult the department listing in [Graduate Programs](#).

Doctoral degree: Candidates must complete their program within six years of the term in which they first register in a doctoral program. In the case of master's students who are reclassified as doctoral students, all degree requirements must be completed within six years of the time they first register as master's candidates.

Graduate diploma and graduate certificate: Candidates must complete all the requirements within four years of the time they first register in the graduate diploma or certificate program.

[...]

Failure to Maintain Active Registration

If students fail to maintain active registration, their program of study will be cancelled by FGSR (See [Maintenance of Registration and Time Limit for Completion of Graduate Programs](#)).

When a graduate student's program is cancelled, the student - supervisor/supervisory committee relationship is dissolved. Students without an active program are no longer entitled to supervisory advice/guidance/feedback on their program of study nor are supervisors and/or supervisory committee members required to provide it. Similarly, course based Master's students are not entitled to advice/guidance/feedback from program advisors.

Further, and where relevant, any data a student collects while unregistered as a graduate student cannot be used for the purpose of their own thesis research since ethics approvals lapse when program registration lapses.

Readmission

If a student intends to resume work on their program, they must apply for readmission and have their program reassessed in accordance with the regulations in force at that time. Readmission is not guaranteed. (See [Maintenance of Registration and Time Limit for Completion of Graduate Programs](#)). If a student is recommended for readmission by their department, the student will pay a readmission fee, which will be assessed in addition to standard program fees in effect at the time.

For thesis-based programs, when a student submits their request for readmission to complete their program, a request to reappoint the supervisor and reconstitute the

course-based master's program. In the case of students transferring from a thesis-based or other program, the beginning of the program is the term of initial registration in the first program. Consult the department listing in [Graduate Programs](#).

Doctoral degree: Candidates must complete their program within six years of the term in which they first register in a doctoral program. In the case of master's students who are reclassified as doctoral students, all degree requirements must be completed within six years of the time they first register as master's candidates.

Graduate diploma and graduate certificate: Candidates must complete all the requirements within four years of the time they first register in the graduate diploma or certificate program.

[...]

Failure to Maintain Active Registration

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When a graduate student's program is cancelled, the student - supervisor/supervisory committee relationship is dissolved. Students without an active program are no longer entitled to supervisory advice/guidance/feedback on their program of study nor are supervisors and/or supervisory committee members required to provide it. Similarly, course based Master's students are not entitled to advice/guidance/feedback from program advisors.

Further, and where relevant, any data a student collects while unregistered as a graduate student cannot be used for the purpose of their own thesis research since ethics approvals lapse when program registration lapses.

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For thesis-based programs, when a student submits their request for readmission to complete their program, a

supervisory committee must also be submitted, and is subject to approval by the Dean, FGSR.

Students who are readmitted for the purpose of completing their degree program must be registered full time until their final program requirement(s) are completed.

request to reappoint the supervisor and reconstitute the supervisory committee must also be submitted, and is subject to approval by the Dean, FGSR.

Students who are readmitted for the purpose of completing their degree program must be registered full time until their final program requirement(s) are completed.

Reviewed/Approved by:

GPST - March 27, 2023
PRC - April 6, 2023
FGSR Council - May 31, 2023 (Discussion)
FGSR Council - September 13, 2023
Programs Committee - TBD
GFC - TBD

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