The following Motion and Document were considered by the GFC Academic Planning Committee at its November 28, 2012 meeting:

Agenda Title: **Proposal for a Bachelor of Science (BSc) in Radiation Therapy Degree Program in the Faculty of Medicine and Dentistry**

APPROVED MOTION: THAT the GFC Academic Planning Committee approve, under delegated authority from General Faculties Council, the (proposed) Bachelor of Science (BSc) in Radiation Therapy Degree Program, as submitted by the Faculty of Medicine and Dentistry and as set forth in Attachment 1, to take effect September, 2013.

Final Item: 4

OUTLINE OF ISSUE

Agenda Title: **Proposal for a Bachelor of Science (BSc) in Radiation Therapy Degree Program in the Faculty of Medicine and Dentistry**

Motion: THAT the GFC Academic Planning Committee approve, under delegated authority from General Faculties Council, the (proposed) Bachelor of Science (BSc) in Radiation Therapy Degree Program, as submitted by the Faculty of Medicine and Dentistry and as set forth in Attachment 1, to take effect September, 2013.

Item

Action Requested	☒Approval ☐Recommendation ☐Discussion/Advice ☐Information
Proposed by	Douglas Miller, Dean, Faculty of Medicine and Dentistry
Presenters	Fraser Brenneis, Vice-Dean (Education), Faculty of Medicine and Dentistry; Sandy McEwan, Chair, Department of Oncology, Faculty of Medicine and Dentistry; Susan Fawcett, Program Director, Alberta School of Radiation Therapy, Alberta Health Services - Cancer Care
Subject	Bachelor in Science (BSc) in Radiation Therapy

Details

Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is (please be specific)	There has been a clear demonstration of the need for this new degree program to ensure that radiation therapists entering clinical practice have the appropriate scientific and clinical knowledge to assure the highest level of care. As the practice of radiation therapy expands, this baccalaureate program will be flexible enough to allow an increase in cohort size, as appropriate, and provide expanded career opportunities for Albertans. The Alberta School of Radiation Therapy (ASRT) commenced the final student intake in the current Radiation Therapy training program in September, 2012 with completion of that cohort in December, 2014. Since the ASRT is the only educational entity to offer the radiation therapy education between Manitoba and the West Coast, the creation of a degree program in radiation therapy will not impact other educational institutions when the University opens enrolment to students in 2013-2014.
The Impact of the Proposal is	The establishment of the above-noted degree also provides the University with the opportunity to build a program that can contribute to learners in other Departments and in other Faculties. The undergraduate degree courses that will be developed in cancer biology, radiobiology, and cross-sectional anatomy may well be attractive to students in other health-discipline Faculties and in the Faculty of Science. In addition, the computer simulation lab being developed in University Terrace will provide a unique infrastructure for teaching cross-sectional anatomy and some of the imaging disciplines not only to medical students but also to residents in disciplines that will include radiology and diagnostic imaging, radiation oncology, and medical oncology. In establishing the best new radiation therapy baccalaureate program, it is the intention of the Department of Oncology to build capacity for students across the University. The capacity built by the program will enable the University to remain

	competitive in this field for the foreseeable future, and the development of the upgrade path and Master's degree with advanced practice certification will enable University to offer a unique program that will attract students from across the country.
Replaces/Revises (eg, policies, resolutions)	N/A
Timeline/Implementation Date	First intake of students into a pre-professional year is the Fall, 2013.
Estimated Cost	See Appendix L to the attached proposal for the budget associated with this (proposed) degree program.
Sources of Funding	New monies; funding from the Provincial Government.
Notes	N/A

Alignment/Compliance

Alignment with Guiding Documents	Aligns with *Dare to Deliver; Comprehensive Institutional Plan* values. This program supports the University's Comprehensive Institutional Plan CIP (2011) Access Goal 19 by providing laddering opportunities for current radiation therapists to a post-secondary degree. Phases II and III of the RADTH program will provide additional opportunities for working professionals and newly-graduated RADTH program students to bridging programs for advancing their credentials to an undergraduate and Master's-level degree, respectively. Part of this proposal includes the development of a distance, and resident, program to facilitate this upgrade path for individuals who have met the entry requirements established by the University. This will be an innovative program that will build upon the success of the on-campus didactic course. In addition, we are planning now to establish a Master's program in radiation therapy, together with an advanced practice certification, to provide the next generation of radiation therapists with a clear opportunity for career development and involvement in an expanded clinical practice role. The universal bursar is uniquely positioned to provide this advanced education, and we believe that this will become a magnet for recruitment across the country. The *Dare to Deliver* Cornerstone of attracting, developing, and retaining talented people is supported by creating a world-class radiation therapy educational facility, complete with the latest technologies for students and faculty alike; offering opportunities to collaboration; and carrying out leading-edge innovation in scholarly research and educational experiences.
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	1. ***Post-Secondary Learning Act* (*PSLA*)**: The *PSLA* gives GFC responsibility, subject to the authority of the Board of Governors, over academic affairs (Section 26(1)). Further, the *PSLA* gives the Board of Governors authority over certain admission requirements and rules respecting enrolment (Section 60(1)(c) and (d)). The Board has delegated its authority over admissions requirements and rules respecting enrolment to GFC. GFC has thus established an Academic Standards Committee (ASC). 2. ***PSLA***: GFC may make recommendations to the Board of Governors on a number of matters including the budget and academic planning (Section 26(1)(o)). GFC delegates its power to recommend to the Board on the budget and on new or revised academic programs to the GFC

	Academic Planning Committee (APC). 3. ***PSLA***: The *PSLA* gives Faculty Councils power to "provide for the admission of students to the faculty" (29(1)(c)). 4. ***PSLA***: The *PSLA* gives Faculty Councils the authority to "determine the programs of study for which the faculty is established" (Section 29(1)(a)); to "provide for the admission of students to the faculty" (Section 29(1)(c)); and to "determine the conditions under which a student must withdraw from or may continue the student's program of studies in a faculty" (Section 29(1)(d)). 5. ***UAPPOL Admissions Policy***: "Admission to the University of Alberta is based on documented academic criteria established by individual Faculties and approved by GFC. This criteria may be defined in areas such as subject requirements, minimum entrance averages, and language proficiency requirements. In addition to academic requirements for admission, GFC authorizes each Faculty to establish such other reasonable criteria for admission of applicants as the Faculty may consider appropriate to its programs of study, subject to the approval of GFC (e.g. interview, audition, portfolio, etc.) The admission requirements for any Faculty will be those approved by GFC as set forth in the current edition of the *University Calendar*. In addition to the admission requirements, selection criteria for quota programs, where they exist, will also be published in the current edition of the *University Calendar.* The responsibility for admission decisions will be vested in the Faculty Admission Committees or in the Deans of the respective Faculties, as the councils of such Faculties will determine." 6. ***UAPPOL Admissions Procedure***: "**PROCEDURE** 1. EFFECTIVE DATE OF CHANGES TO ADMISSION REGULATIONS Following approval by GFC: a. Where changes to admission regulations may disadvantage students in the current admission cycle, normally implementation will be effective after the change has been published in the *University Calendar* for one full year (i.e., effective the second year that the information is published in the *University Calendar*). […] b. Where changes to admission regulations are deemed by the approving body to be "advantageous to students", normally the date of implementation will be effective immediately or at the next available intake for the admitting Faculty." 7. ***UAPPOL Academic Standing Policy***: "All current academic standing regulations, including academic standing categories, University graduating standards and requirements for all individual programs will be those prescribed by Faculty Councils and GFC as set forth in the University Calendar."

	8. ***UAPPOL Academic Standing Regulations Procedures***: "All proposed new academic standing regulations and changes to existing academic standing regulations will be submitted by the Faculties or the Administration to the Provost and Vice-President (Academic). Faculties will also submit to the Provost and Vice-President (Academic) any proposed changes to the use and/or computation of averages relating to academic standing, including promotion and graduation. If the Provost and Vice-President (Academic) determines the proposal to be in good order, the proposal will be introduced to the appropriate University governance process(es). In considering these proposals, governance bodies will consult as necessary with the Faculties and with other individuals and offices. Normally, changes become effective once they are approved by GFC or its delegate and are published in the University Calendar." 9. **GFC Academic Standards Committee (ASC) Terms of Reference (*Mandate*)**: The Office of the Provost and Vice-President (Academic) has determined that the proposed changes are substantial in nature. ASC's terms of reference provide that "the term 'substantial' refers to proposals which involve or affect more than one Faculty or unit; are part of a proposal for a new program; are likely to have a financial impact; represent a definite departure from current policy; involve a quota; articulate a new academic concept" (3.A.ii). Further, "ASC provides advice or recommends to the GFC Academic Planning Committee (APC) on proposals which involve substantial change to admission/transfer regulations or academic standing." (3.B.iv) 10. **GFC Academic Planning Committee (APC) Terms of Reference (*Mandate*)**: GFC delegated the following to GFC APC, the Provost and Vice-President (Academic) and the Dean of FGSR: "**Existing Undergraduate and Graduate Programs:** **- Extension and/or Substantive Revision of Existing Programs** **- Revisions to or Extension of Existing Degree Designations** All proposals for major changes to existing undergraduate and graduate programs (eg, new degree designation, new curriculum) shall be submitted to the Provost and Vice-President (Academic). […] The Provost and Vice-President (Academic), after consultation with relevant Offices, committees or advisors[,] will place the proposal before APC. APC has the final authority to approve such proposals unless, in the opinion of the Provost and Vice-President (Academic), the proposal should be forwarded to GFC with an attendant recommendation from APC. […]" (3.13.) 11. ***PSLA***: "The Campus Alberta Quality Council may inquire into and review any matter relating to a proposal to offer a program of study leading to the granting of an applied, baccalaureate, master's or doctoral degree other than a degree in divinity." (Section 109(1))

	Note: While, normally, GFC ASC has delegated authority from General Faculties Council to approve all proposed regulations regarding Faculty-specific re-examination criteria (Section 3.B.ii of GFC ASC's Terms of Reference) and physical testing (including immunization) criteria (Section 3.E of GFC ASC's Terms of Reference), these proposed requirements set out in the attached material go forward, instead, to the GFC Academic Planning Committee (APC) for approval as a part of the Committee's review of the overall proposal for the establishment of the BSc in Radiation Therapy degree program.

Routing (Include meeting dates)

Consultative Route (parties who have seen the proposal and in what capacity)	1. Faculty of Medicine and Dentistry Learning Committee – August 17, 2012 2. Faculty of Medicine and Dentistry Chairs' Committee – August 29, 2012 3. Faculty of Medicine and Dentistry Dean's Executive Committee – September 5, 2012 4. GFC ASC Subcommittee on Standards (SOS) – October 4, 2012
Approval Route (Governance) (including meeting dates)	Faculty of Medicine and Dentistry Council (September 25, 2012) – for recommendation; GFC Academic Standards Committee (November 15, 2012) – for recommendation of the (proposed) admission/transfer, academic standing/graduation, physical testing (immunization), and re-examination requirements; GFC Academic Planning Committee (November 28, 2012) – for final approval
Final Approver	GFC Academic Planning Committee

1. Attachment 1 (pages 1 – 97) – Template C - Radiation Therapy Degree Program Proposal from the Faculty of Medicine and Dentistry

Prepared by: Sandi Barber, Director, Administration, Office of Education, Faculty of Medicine and Dentistry

Program Approval Template C

Program changes are essential to program viability, maintenance of program quality and service to both the student and society. They flow from institutional vigilance and continued review of the needs of society and students. They are also carefully monitored for quality through established institutional processes (see *Quality Assurance at Alberta's Universities*).

This Template is a common form that will be used for central vetting and approval at Alberta's public universities, submitted to the Alberta Minister of Enterprise and Advanced for system co-ordination review and subsequent referral to the Campus Alberta Quality Council (CAQC) for its review and recommendation. Council will also expect the University's request and rationale for a fully-expedited review (in advance or at the same time as the system co-ordination submission). If the Ministry and/or Council determine that more information is required and/or a partially-expedited review is necessary, that will be communicated to the University as soon as possible. Note that individual universities will develop their own version of the Template, which may list additional questions after the set of common ones.

This Template applies to

x New degree programs in a new discipline or level that involve new program structures and/or significant faculty, course offerings, or other resource expansion (eg, BA in German at Athabasca University).

Basic Information

1. **Title of the program: Bachelor of Science in Radiation Therapy (RADTH)**
2. **Proposed start date:**
   - **Pre Professional Year (Undergraduate studies) Sept 2013**
   - **Professional Years – Sept 2014**
3. **Length of the program (years): four years; year one pre-professional (undergraduate) qualifying year and remaining years in degree program**
4. **University and academic unit: Faculty of Medicine & Dentistry (FoMD) and the Department of Oncology (OE) FoMD**
5. **Collaborating partners at other institutions: Alberta Health Services (AHS) Cancer Care (CC), University of Calgary, Tom Baker Cancer Care (TBCC), Cross Cancer Institute (CCI)**
6. **Contact person, with telephone and e-mail address:**

Dr. Fraser Brenneis	Vice-Dean, Education, Faculty of Medicine & Dentistry (FoMD)	fraser.brenneis@ualberta.ca (780) 492-1950
Dr. Sandy McEwan	Professor & Chair, Oncology, FoMD	mcewan@ualberta.ca (780) 432-8524
Susan Fawcett	Program Director, Alberta School of Radiation Therapy Alberta Health Services - Cancer Care	Susan.Fawcett@albertahealthservices.ca
Cynthia Henderson	Assistant Chair, Department of Oncology, FoMD	cjh1@ualberta.ca(780) 432-8576
Vivien Wulff	Chief Operating Officer, FoMD	vivien.wulff@ualberta.ca (780) 492-1558

7. **Completed/proposed approval path**:

1.	Faculty Learning Committee (for information)	August 17, 2012
2.	FoMD Dean's Executive	August 29, 2012
3.	FoMD Chairs Committee	September 5, 2012
4.	FoMD Faculty Council	September 25, 2012
5.	GFC ASC Subcommittee on Standards (SOS)	October 4, 2012
6.	GFC ASC Academic Standards Committee	November 15, 9-12 noon
7.	GFC APC Academic Planning Committee	November 28, 2-4 pm
8.	Enterprise and Advanced Education	
9.	Quality Council	

8. Attach proposed program and course University Calendar descriptions, overall program structure and requirements, and other supporting documentation (detailed in Appendix A and B).

The radiation therapy degree program, like degrees in all health sciences disciplines, requires an educational experience that integrates didactic education in science with concepts and practical applications in caring for the patient, and also specific procedure-based teaching that is discipline specific. The proposed program, including the structure and the requirements, recognises this complexity and attempts to integrate all of the elements required to produce a knowledgeable, scientifically up-to-date and compassionate practitioner. In addition, the requirements of the degree must also prepare the student for challenging the National certification examination.

The requirements for the pre-professional year have been carefully chosen to prepare the potential student for the integrated three-year didactic experience, and also to ensure that they have the necessary scientific background to be successful. Once the students have been selected out of the pre-professional year, we propose that there will be an introductory period at the end of the first year to become aware of the expectations and constraints of the course they have chosen.

The courses in year's two to four have been chosen to provide the students with the necessary scientific, clinical and research background to be able to function effectively in the clinical environment. The final year of predominantly clinical teaching and education is designed to ensure that the student can pass seamlessly into the clinical job market: complete program details are detailed in Appendix A and B. A summary of the program follows.

Pre Professional Year 1		Professional Year 2			Professional Year 3			Professional Year 4	
Fall	Winter	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter
ENGL 1XX	ANAT 200	ONCOL 243 Radiation Protection	ONCOL 253 Cancer Biology	ONCOL 255 Clinical Oncology II	Elective	ONCOL 335 Radio biology	RADTH 360 Clinical Sim-ulation	RADTH 401 RT Research Method-ology	RADTH 411 RT Research Project
PHYS 124	PHYS 126	ONCOL 233 Concepts Medical Physics	ONCOL 210 Radiation Oncology I	RADTH 260 Clinical Intro & Skills Practicum I	RADTH 301 Radiation Therapy Principles & Practices	ONCOL 310 Radiation Oncology II		RADTH 460 Clinical Practicum II	RADTH 461 Clinical Practicum III
PSYCO 104	PSYCO 105	CELL 201 Introduction to Molecular Cell Biology	ONCOL 234 Equipment/ Instrument ation		ONCOL 355 Treatment Planning & Dosimetry I	ONCOL 356 Treatment Planning & Dosimetry II			
MATH calculus 113, 114	BIOL 107	RADTH 205 Patient Care	ONCOL 254 Clinical Oncology I		ANAT 305 Cross Sectional Anatomy	ONCOL 306 Imaging Principles/ Pathology			
CHEM General 101	CHEM Organic 261	PHYSL 210 Human Physiology			RADTH 328 Health Care Policy	INT D 410 Inter-professional Practice			

Rationale and Quality

9. Provide an overview of the program, including distinctive features relative to existing offerings, the modes of program delivery available, and any experiential components.

The newly created baccalaureate in radiation therapy will be a four-year program. The first year will be a required pre-professional year that students can take at any Canadian post-secondary institution. The three year professional program will reside in the Faculty of Medicine & Dentistry (FoMD), Department of Oncology, and will result in the award of a Bachelor of Science degree. Radiation therapy is one of the three core health sciences disciplines responsible for the planning, delivery and quality management of therapeutic doses of ionizing radiation for patient treatment. Training for this discipline is at present run through Alberta Health Services (AHS) as a 28-month diploma; graduates access the Canadian Association of Medical Radiation Technologists (CAMRT) certification examination, and the program is accredited by the Canadian Medical Association (CMA). National and international trends, recognizing the complexity of the cancer management, have moved to an intercalated didactic and clinical training environment within a baccalaureate program. This new degree is a response by the Government of Alberta to that trend. A model for this approach already exists within FoMD in the dental hygiene and medical laboratory sciences degrees.

There will be three distinct elements to the educational experience within the degree program:

1. The first year will be a foundation year that will incorporate required courses, taken from the University calendar, to prepare students for the next three years that will incorporate interleaved scientific and clinical education.
2. Within these three years there will be mandatory courses, developed by the Department of Oncology, which will cover (a) a background to cancer biology, cancer treatments, and the clinical

management of patients with cancer, (b) medical physics, radiation safety and radiation risk (c) radiobiology and interactions of radiation with tissue, (d) gross and cross sectional anatomy, (e) principles of imaging as related to radiation therapy.
3. Clinical practicums that will include treatment planning, interactions with and care of patients, clinical aspects of radiation therapy delivery and physical assessment.

At the end of the baccalaureate program, the students will be positioned to challenge the CAMRT certification examination. It is anticipated that the cancer biology and anatomy courses developed for this course will have broader interest across the university campus.

The clinical education will involve the use of a three-dimension linear accelerator simulator to prepare students for the clinical environment; training in clinical interactions using simulated patient interaction and an OSCE format; training on a non-clinical linear accelerator training simulator; training on a dedicated training CT simulator; treatment planning education in a dedicated computer classroom; clinical practicums in the Cross Cancer Institute (CCI) in Edmonton, and in the Tom Baker Cancer Centre (TBCC) in Calgary. The clinical practicums, treatment planning education and clinical interaction simulations will be based upon the experience gained in the current diploma program. As new radiation therapy sites come on line in Lethbridge, Red Deer and Grande Prairie, it is anticipated that clinical training will also move to include these sites.

10. What is the rationale for the proposed new program?

The practice of radiation therapy has, over the past decade or so, become increasingly complex, requiring ever-greater knowledge of medical physics, anatomy, radiobiology and cancer biology. With the increasing use of treatment techniques such as image guided adaptive radiotherapy, the clinical expectations of a therapist have expanded significantly. In identifying these major practice shifts, the CAMRT has implemented strategic changes to the national *Radiation Therapy Competency Profile*, http://www.camrt.ca/certification/canadian/competencyprofiles/Curr_guide_Radiation_Therapy.pdf, which have significantly expanded expectations for radiation therapy education programs. These expectations can no longer be achieved in a certification-based educational environment, requiring a breadth of education and an understanding of fundamental scientific principles that need to be placed in an academic, research-based, post-secondary institution. Ontario moved their educational programs to a baccalaureate degree for radiation therapists in the late 1990s; Alberta is the last major jurisdiction in Canada to make this transition.

With the creation of a baccalaureate program that integrates didactic and scientific education with an expanded clinical education component, the University will be providing an environment that ensures that the CAMRT competency profile is met, that students will be appropriately prepared to challenge the certification examination and that CMA accreditation standards will be exceeded.

11. Outline the University's demonstrated expertise and capacity in this program area. For graduate programs - address the experience of the unit in advanced work and your ability to deliver a quality program by commenting on your depth in the discipline. Provide a list of the names and expertise of faculty members and, where available, the progress of students who have already graduated.

The University of Alberta is ideally positioned to meet the current and future needs of radiation therapy education in the province of Alberta. We believe that it is realistic to begin the first intake in September, 2013, if planning and early implementation for the transition can be completed in the next two to three months.

The radiation therapy baccalaureate program will be positioned in the Department of Oncology (DO) in FoMD, and a new division within the Department will be created to support the program. There are five accredited residency programs in radiation oncology, medical oncology, palliative care and two programs in medical physics; radiation therapy and nuclear medicine. In addition, the Department runs an oncology block for medical students in their third year which has won an award for block of the year for the past five years. The graduate program is well-established, and has graduated 30 MSc and 32 Ph.D. students over the past 10 years. Education in clinical radiation sciences currently occurs in the Divisions of Radiation Oncology, Medical Physics and Experimental Oncology. All three of these Divisions have provided support and education to learners in the current Radiation Therapy diploma program. We established a 300-level undergraduate oncology course; the courses that will be required for the RT degree program will be a natural extension of the educational offerings that are already well established in the Department, which has the spectrum of clinical and scientific expertise to anchor the new degree. However, with the introduction of baccalaureate status, there will be a requirement for additional faculty and staff to meet the significantly expanded program requirements in teaching and mentoring. Faculty staffing requirements are detailed in Appendix E.

12. How will the program expose the learner to a high-quality learning experience?

The Department of Oncology has extensive experience in teaching learners in the undergraduate, graduate and clinical domains. The creation of the educational framework and courses for this new baccalaureate will build upon this experience, and will utilize much of the infrastructure currently in place in the Department for teaching the undergraduate, graduate and residency programs.

The important areas of background to clinical practice and development of practical clinical skills will be supported through the development of new courses in clinical oncology and in radiation oncology. The clinical oncology course will be based upon the innovations developed by Dr. Scott North in teaching DMED 525. This course has received numerous teaching awards, and Dr. North received a 3M award in 2010 for his contributions to innovation and quality in teaching medical students.

The Division of Medical Physics has extensive experience in teaching learners at all levels of experience, and has for many years contributed to the radiation therapy diploma program. A minimum of four new courses will be developed to support this new degree, and there will also be significant clinical interactions between the medical physics group and the radiation therapy student cohorts, particularly in teaching treatment planning. An innovative computer laboratory is being established to facilitate teaching in this latter area. The courses will utilize an educational version of the clinical software used to create clinical teaching plans, and students will be exposed to all treatment planning methodologies currently used in clinical practice, including Image Guided Adaptive Radiotherapy.

A clinical simulation course will be developed using innovative simulation technology (Immersive VERT – Appendix G) to teach students the safe use of linear accelerators. It is also proposed to establish a teaching laboratory to provide students with hands on training in the safe and effective clinical use of linear accelerators and CT simulators prior to entering the clinical environment.

The Division of Experimental Oncology will support teaching in cancer biology; one 300-level course is already offered by the Department, and the expertise and experience gained in this area will support the proposed new cancer biology course designed specifically for this program. It is anticipated that this course will eventually become one that will be open for broad university enrolment.

Radiobiology is a fundamental scientific discipline of considerable importance to this group of students; an understanding of the biology of the interaction of radiation with tissue is critical to the field of clinical

practice that the students have chosen. We believe that one of the differentiators between this program and others in the country will be our ability to provide both depth and breadth in this discipline, including the introduction of new concepts in radiobiology to ensure that the students leave the program with a knowledge base that is at the cutting-edge of the field and that will serve as a scientific foundation for their future clinical practice.

The depth and breadth of undergraduate clinical and postgraduate teaching within the Department mean that this course will be introduced into, and will evolve in, an environment which is supportive of the highest standards of university education and of clinical teaching.

A major area support to the program is the strength of clinical research within the Department of Oncology and at the CCI. More than 10 per cent of the patients who attend the CCI are enrolled in clinical trials, the highest rate within the country. Of particular importance to this radiation therapy baccalaureate program is the very successful clinical trials group in Image Guided Adaptive Radiotherapy. As well the Division of Radiation Oncology is a major contributor to the Radiation Therapy Oncology Group, which is the major international clinical trials organisation running all phases of clinical trials in radiation oncology. The graduate program has been described above, and will provide broad infrastructure support to not only the clinical practice, but also the research methodology, components of the baccalaureate program.

13. Provide a brief demonstration of external support regarding the value of the program.

The new bachelor's degree has received support from several sources including The Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) who is supportive of the strategic move to be affiliated with a post-secondary institution for degree credentialing The Canadian Association of Medical Radiation Technologists has also indicated strong support.

- Chair, Radiation Therapy and the Academic Coordinator, Medical Radiation Sciences Program, The Michener Institute for Applied Health Sciences
- Senior Medical Director and Senior Vice President, Cancer Care, Alberta Health Services
- Chair, Provincial Radiation Services Council, Cancer Care, Alberta Health Services
- Chief Executive Officer, Canadian Association of Medical Radiation Technologists (CAMRT)
- Chief Executive Officer/Registrar, Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) to the Executive Director, Workforce Policy and Planning Branch, Alberta Health and Wellness

Letters confirming support of the program is detailed Appendix C.

14. Describe how this new program is reflected in the University's strategic and academic plans (eg, *Dare to Discover*; *Dare to Deliver*), business plan, and accessibility plan.

A radiation therapist is one of three key members of the team of health care professionals who use radiation to treat cancer patients. Their role in radiation delivery, patient care and support and the safe use of radiation has, over the past 15 years, become increasingly complex as new treatment delivery modalities have been introduced into routine clinical practice. The knowledge base and the spectrum of skills required of these care-givers have increased exponentially over that period of time. Making the educational commitment to these individuals reflects the highest aspirations of the University institutional plan and of the Dare to Deliver 2011 – 2015 academic plan.

The provision of an outstanding learner experience through a mix-modality learning environment inside and outside the classroom that includes, interprofessional learning experiences, practicums and technology-enhanced learning experiences will lead to a program that is recognised nationally and internationally for quality, innovation and clinical excellence. The learning experience will include state-of-the-art technology and expose learners to inquiry-based learning with exposure to leading-edge researchers, clinical researchers and educators in FoMD.

By definition, the practice of radiation therapy is interdisciplinary and collaborative, and builds upon the principles of clinical excellence and patient focus. This new program will foster a collaborative model for course delivery by partnering with other health disciplines, research scientists, clinical practice leaders and provincial health systems to provide scientific and clinical teaching. Learners will attend hospitals providing cancer care throughout the province for clinical practicums and clinical education.

The program advances goals for access enshrined in the Comprehensive Institutional Plan by providing innovative, scientifically and clinically relevant programming, and opportunities for interdisciplinary collaborations and linkages. We also believe that it will be important to recognise our responsibility to Aboriginal communities and patients from those communities who require cancer therapy. As part of this proposal we shall provide a path to facilitate Aboriginal enrolment.

The Government of Alberta has identified a looming shortage of qualified radiation therapists over the coming decade; with the significant increase in numbers of new patients presenting with cancer that will be seen in the province over the next 20 years there is a need not only for building this innovative program to compensate for the coming shortage, but also to offer education to two other groups of radiation therapists. We believe that many of the current, practising, radiation therapists who graduated with a diploma will look to the University of Alberta to provide an upgrade path to the new degree. This program supports the University's Comprehensive Institution Plan CIP (2011) Access Goal 19 by providing laddering opportunities for current radiation therapists to a post-secondary degree. Phase II and III of the RADTH program will provide additional opportunities for working professionals and newly graduated RADTH program student to bridging program for advancing their credentials to an undergraduate and Master's level degree respectively.
http://www.resourceplanning.ualberta.ca/en/Planning%20Tools/~/media/University%20of%20Alberta/Administration/Finance%20and%20Administration/Risk%20Management/Subsites/Office%20of%20Resource%20Planning/Documents/University_of_Alberta_CIP_2011_FINAL.PDF

Part of this proposal includes the development of a distance, and resident, program to facilitate this upgrade path for individuals who have met the entry requirements established by the University. This will be an innovative program that will build upon the success of the on-campus didactic course. In addition we are planning now to establish a Master's program in radiation therapy, together with an advanced practice certification, to provide the next generation of radiation therapists with a clear opportunity for career development, and involvement in an expanded clinical practice role. The universal bursar is uniquely positioned to provide this advanced education, and we believe that this will become a magnet for recruitment across the country.

The Dare to Deliver Cornerstone of attracting, developing and retaining talented people is supported by creating a world-class radiation therapy educational facility, complete with the latest technologies for students and faculty alike; offering opportunities to collaborative and carry out leading-edge innovation in scholarly research and educational experiences.

The program will be housed in the Department of Oncology and learners will have exposure to the faculty's highly regarded research, intensive learning framework, excellent infrastructure and clinical care environment.

15. Give information on quality assessment, including criteria to be used for continuous evaluation. How will learner outcomes be measured?

Canadian Medical Association Conjoint Accreditation Services criteria and requirements are used for continuous evaluation of the program and its students. Areas of evaluation include employer, instructor and new graduate satisfaction. Student evaluations of academic courses, instructors, clinical courses and clinical rotations are assessed. In addition, course, clinical practicum and CAMRT national certification examination statistics will also contribute to an overall evaluation of the program. For more information on this visit: http://www.cma.ca/learning/conjointaccreditation

Demand and Administration

16. Outline the expected impact of the new program in terms of professional and academic opportunities for current and prospective students.

There has been a clear demonstration of the need for this new degree program to ensure that radiation therapists entering clinical practice have the appropriate scientific and clinical knowledge to assure the highest level of care. As the practice of radiation therapy expands, this baccalaureate program will be flexible enough to allow an increase in cohort size as appropriate, and provide expanded career opportunities for Albertans.

- The Canadian Association of Medical Radiation Technologists (CAMRT) advocates for a degree as being the entry-to-practice requirement.
- http://www.camrt.ca/abouttheprofession/positionstatements/degreecredentialasentrytopracticerequirement/
- Evidence of the support and necessity of an expanded scope of Practice (Advanced Practice) is available at: http://www.partnershipagainstcancer.ca/wp-content/uploads/CPAC-Symposium-English-Report_r1.pdf .
- Institute for Health Information Report on Medical Radiation Technologists. Radiation Therapists are one of the professions reported on.http://www.cihi.ca/CIHI-ext-portal/internet/EN/TabbedContent/spending+and+health+workforce/workforce/other+providers/cihi010674

The degree also provides the University with the opportunity to build a program that can contribute to learners in other departments and in other faculties. The undergraduate degree courses that will be developed in cancer biology, radiobiology and cross-sectional anatomy may well be attractive to students in other health-discipline faculties, and in the faculty of science. In addition, the computer simulation lab being developed in University Terrace will provide a unique infrastructure for teaching cross-sectional anatomy and some of the imaging disciplines not only to medical students, but also to residents in disciplines that will include radiology and diagnostic imaging, radiation oncology and medical oncology. In establishing best new radiation therapy baccalaureate program, it is the intention of the Department to build capacity for students across the university campus.

The capacity built by the program will enable the University to remain competitive in this field for the foreseeable future, and the development of the upgrade path and Master's degree with advanced practice certification will enable University to offer a unique program that will attract students from across the country.

17. Provide the expected enrolment (or other) impact on the academic unit(s) offering the program and other affected units. Include current enrolment where applicable.

Expected enrollment for the 2014 – 2015 professional years will be 15 students; students wishing to gain entrance into the professional program will apply and go through a selection process during 2013. It should be noted that the program will accept applicants from any accredited post-secondary university within Canada. From 2015 to 2018, enrollment quotas will remain at 20 per year. The anticipated number of students in the program will be 80 students in 2018 (detailed in Appendix D). The program will be able to accommodate a small increase in enrollment should provincial manpower needs increase over the next four years. The program will require small incremental funding increases to accommodate this need.

Students wishing to gain admission into the program will take courses in an undergraduate degree program that include Chemistry, Physics, Psychology, Sociology, Math, Anatomy and Biology. Dr. Brenneis, Vice-Dean, Education in FoMD, is consulting with the Faculties of Arts and Sciences to address possible issues related to impact on current courses.

18. Do you anticipate an enrolment (or other) impact on programs at other institutions or regulatory bodies? Describe any consultations that have occurred with other institutions and professional organizations.

The Alberta School of Radiation Therapy (ASRT) will commence the final student intake September 2012 with completion of that cohort in December 2014. Since the ASRT is the only educational entity to offer the radiation therapy education between Manitoba and the west coast, the creation of a degree in radiation therapy will not impact other educational institutions when the university opens enrolment to students in 2013-2014.

As indicated in section 13, the regulatory body, Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) supports the transition to baccalaureate qualified radiation therapists. The ACMDTT endorses the Canadian Association of Radiation Technologist's (CAMRT) national certification examination for licensure of radiation therapists. Students are required to hold student membership status with ACMDTT and CAMRT in order to access the national certification examination.

The Canadian Medical Association (CMA) Conjoint Accreditation Services is the CAMRT and ACMDTT endorsed accrediting body. Upon approval of the new degree program, discussions will commence with CMA to begin the accreditation process.

19. Provide a program implementation plan by academic year (start to maturity). Include the impact on any programs being phased out, particularly with regard to resources and support.

Program Transition and Integration:
The baccalaureate program in radiation therapy will be introduced over a two-year period. In 2013, the requirements for the pre-professional year will be promulgated and selection criteria will be established. A selection process will be undertaken in the winter term of the 2013/14 academic year. This first cohort of students will enter the professional program starting in September 2014. It is anticipated that initially 15 students will be recruited into this first professional year of the program, and that subsequent years will see the numbers increase to 20 annually, so that by the end of the 1st graduating class there will be a total of 60 students in the program. Depending on Provincial projected manpower needs, the program will be able to accommodate an additional 5 students annually from 2016/17.

Faculty Transition:
The U of A has experience with the transition of teaching personnel from other programs into the academic environment, and will work collaboratively with AHS to ensure either a seamless transfer of faculty from AHS to the University or an appropriate agreement as a transition phase. The current program includes two full-time and five part-time instructors for a total of 5.0 FTE: three reside in Calgary and four in Edmonton. New radiation therapist faculty will be recruited to create an appropriate environment for the expanded course load, and for the increased numbers of students. Development and communication of a transition strategy that incorporates details related to existing faculty credentials, compensation adjustments and level of academic appointment will be necessary to meet the needs of the U of A and the existing and new staff and faculty. In addition, faculty members will need to be recruited to teach the expanded course requirements. These will include experts in medical physics, anatomy, cancer biology, radiobiology, radiation therapy and radiation oncology (detailed in Appendix E).

Student Transition:
In the current hospital-based program, an average of five students is enrolled annually. With the introduction of the baccalaureate, and to meet projections of future provincial staffing needs, there will need to be significant increases in enrollment. We envisage that, initially, 15 students will be enrolled annually, increasing to an annual enrolment of 20, with the possibility of increasing to 25 as future healthcare needs are fully understood.

The program will establish an upgrade path to baccalaureate for appropriately qualified practitioners; this will be created as a distance-learning opportunity, on-campus learning requirements will be identified. Focused communication and consultation will be offered to students in the fall 2011 and 2012 intakes, as these will be the students most impacted by the program transition, and for whom an early upgrade path might be critical to future career development.

Student Support Services:
The Faculty of Medicine & Dentistry recognizes the demands of earning a degree in health care. The Office of Learner Advocacy & Wellness (LAW) in FoMD will be available to ensure that RADTH students are able to achieve to their full potential as students and individuals. We recognize that personal and academic circumstances may arise that create barriers to achievement. LAW provides a safe and confidential venue for students to seek out resources and support around mental and physical health, harassment and intimidation, learning disabilities and career counselling. LAW also strives to ensure an overall supportive academic environment that is conducive to academic achievement and personal growth. University-wide student resources are available as well.

Resource Requirements:
The program will be based at University Terrace (University Terrace, 8303 - 112 St on the university's north/main campus), which is being renovated to fulfill most of the didactic needs for the learners. The virtual linear accelerator simulator will be housed in the Terrace Building for teaching. If courses are expanded to the wider University community, larger classroom space will be required on campus. In addition, a modified linear accelerator, plus the educational CT scanner, will be housed in new or newly renovated space in the basement of the CCI. Clinical teaching and practicums will occur in the CCI and the TBCC, with subsequent expansion to Lethbridge, Red Deer and Grande Prairie.
Between September 2012 and September 2014, a number of specific tasks have to be undertaken to ensure that the program will be fully operational for the professional year entering in September 2014.

1. Complete the diploma program for the classes entering in September 2011 and 2012; this latter group will challenge the certification examination in January 2015.
2. Recruit faculty for course development in anatomy, cancer biology, radiobiology, medical physics and radiation oncology.
3. Recruit faculty for course development in clinical radiation therapy.
4. Develop new courses, validate and build teaching plans.
5. Install and validate equipment to be used during the course:
    a. Immersive VERT simulator
    b. Computer laboratory
        i. Access and validate treatment planning software and cases
        ii. Access and validate cross-sectional anatomy teaching software
        iii. Access and validate clinical CT and MRI viewing software and cases
6. Develop an expanded curriculum and teaching plan for clinical teaching in years three and four; the first clinical teaching year, to be conducted at the Cross Cancer Institute (CCI) and the Tom Baker Cancer Centre (TBCC), will begin in September 2016.
7. Install the training linear accelerator and the training CT simulator in newly developed space in the basement of the CCI by quarter one, 2015. This installation will be required for the clinical education module to be conducted in the spring term of the third year.
8. Obtain provisional program accreditation from CMA.
9. Develop a marketing tool that can be used to explain the new degree program to students within the University and as part of the University's recruitment strategy.
10. Complete the transitional arrangements for current AHS employees teaching in the diploma program from AHS to the University.
11. Establish an e-Learning environment that can the offered to practitioners in the field who are appropriately qualified and who wish to upgrade to a degree designation.
12. Develop an MSc in Radiation Therapy that, together with the curriculum for a teaching and clinical education program, will lead to an advanced practice certification for practicing radiation therapists.

Program Transition and Integration Timeline							
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Students	Last intake for diploma	First Pre-professional year -Student application to program and student selection	First degree intake 15 students	Second intake 20 students	Third intake 20 students	Fourth intake 20 – 25 students	Fifth intake 20 – 25 students
Faculty	-Create & review job description - Start recruitment	Hire -Med Phys 1 -Med Phys 2 -Anatomist -Rad Onc Cancer/ radiobiologist -RT's 1 -3 -T&L Specialist	Hire RT 4 -Cancer/ radio biologist 2	Hire -RT 6			
Admin Support	-Create & review job description - Start recruitment	-Hire -3 admin support -Ac.Tech Specialist	-Hire 1 support for Phase II and Masters support				
Courses	-Course calendar complete	-Course development	-Course development	-Refine clinical practicum courses	-Refine clinical practicum courses		
Upgrade Path		-Start process -Course review	-Course completion	-First offering			
MSc and Advanced Practice		-Discussions with ACMDTT- -Create MSc and AP framework	-Course development	-Course development	-First intake		
Equipment & Renovations	-Define needs -Confirm CCI space availability	-University Terrace renovation -Order VERT, T Linac, CT Sim	-CCI renovation -Install VERT and computer lab	-Install CT Sim and T Linac			
Accreditation		-Request date for accreditation visit		-Anticipated accreditation visit date			

20. Describe how the proposed program fits within the broader Alberta post-secondary system. Is it unique to the province, the country? Does it compete with or complement other programs in the system? If the program is similar to or duplicates an existing program, is the duplication warranted? How does the program advance Campus Alberta?

Radiation therapy education has historically been facilitated within the health system in Alberta. It was initially created as individual programs in Edmonton and Calgary, and then recreated as a provincial program by the Alberta Cancer Board, and subsequently taken over by AHS. As other jurisdictions in the country have move to a baccalaureate, it has been increasingly difficult to recruit and to educate the numbers of students required, and to reach the levels of rigor that are necessary for this rapidly advancing and increasingly complex profession. A bachelor degree-prepared radiation therapist is critical to the future of radiation therapy in Alberta and, in particular, to the patients they will serve.

This will be the only education program for radiation therapists in the province of Alberta, and whilst the didactic component will be offered only in Edmonton, clinical education will be offered across the province, initially in Edmonton and Calgary at the CCI and at the TBCC. We work closely with our clinical and academic colleagues at the TBCC and at the University of Calgary and anticipate that this new degree will reflect the guiding principles of Campus Alberta.

It is anticipated that expansion of radiation therapy practice will evolve rapidly to require advanced practice certification. We will establish a Master's level degree to create graduates who will be eligible to challenge the advanced practice certification requirements of CAMRT.

21. Describe the current student demand for the new program.

The current diploma program operated by AHS is undersubscribed. The general public is largely unaware of the radiation therapy profession. Students attracted to the new program will often have had personal or family exposure to cancer care professionals. Utilizing the U of A's recruitment strategies, the education program is likely to experience increasing interest from the student population. The education program will attract students who have a desire for a career in a health-related field with a great deal of patient contact, and who are interested in technology. Baccalaureate programs in other provinces are currently significantly oversubscribed. It is anticipated that there will be considerable demand for the program's Phase II bridging program, which will be facilitated via e-Learning and with some on-campus learning requirements. For more information on the need for expanded capacity and roles in the radiation therapy field, visit *How Many Are Enough? Redefining Self-Sufficiency for the Health Workforce, Expanding Scopes of Practice and Developing New Roles,* available at http://www.hc-sc.gc.ca/hcs-sss/pubs/hhrhs/2009-self-sufficiency-autosuffisance/index-eng.php#a10

22. Is there labour market demand for this program? What steps were taken to assess labour market demand? The demand analysis should be support with relevant data.

The Alberta Government and AHS have announced the opening of new radiation oncology departments in the province. The Central Alberta Cancer Center in Red Deer will open in the summer of 2013, and the Grande Prairie Cancer Center is anticipated to open in 2016/17 in conjunction with the new hospital. These two new centers will require radiation therapists, as will the existing centers in Lethbridge, Edmonton and Calgary. Expansions of both the TBCC and CCI are in the functional planning stages, and construction is anticipated to commence in 2013 and 2014. In addition, current workforce attrition is likely to increase over the next decade due to the aging demographic.

This initiative is being driven from three stakeholder groups:

- The Alberta Government (Ministries of Health and Enterprise and Advanced Education)
- The employer (Alberta Health Services)
- The regulatory body (Alberta College of Diagnostic and Therapeutic Technologists)

Current Radiation Therapy Education Programs in Canada		
Province	**Educational Institution**	**Bachelor degree**
British Columbia	British Columbia Institute of Technology, School of Health Sciences.	Yes
Alberta	Alberta Government Radiation Therapy 28 month program	No
Saskatchewan	Students enrol in Manitoba program and clinical component in Saskatchewan.	No
Manitoba	University of Winnipeg	Yes
Ontario	Laurentian University/Michener Institute for Applied Health Sciences	Yes
	University of Toronto/Michener Institute for Applied Health Sciences	Yes
	McMaster University/Mohawk College	Yes
New Brunswick	University of New Brunswick Saint John	Yes
Rest of Maritimes	All send their students to Ontario programs due to their small numbers.	No

The government of Alberta and AHS have identified an impending shortage of radiation therapists in the province, which is expected to peak in 10 to 15 years. The demographics of radiation therapists in the province suggest that there is likely to be approximately one-third of therapists retiring over the next 15 – 20 years:

Age	**Number of Practicing Therapists In Alberta**
22 to 25	4
26 to 30	30
31 to 35	28
36 to 40	23
41 to 45	36
46 to 50	27
51 to 55	21
56 to 60	12
61 to 65	6
Total	187

The potential staff shortages due to this retirement "bulge", together with the expansion of radiation oncology facilities in the province that will occur over the next five years, will result in major shortfalls in personnel in the absence of a proactive integrated baccalaureate program. The provision of treatment with radiation to patients with cancer is a major part of the available therapy armamentarium, and it is anticipated that the use of radiation therapy will increase over the coming years, particularly as we are expecting to see a significant increase in new cancer presentations. This

degree program therefore, is an important element of risk management, to ensure that appropriate staffing levels can be maintained.

23. Explain the level and kind of support that will be provided by professional organizations, regulatory bodies, employers, and industry. Provide evidence of consultation and support.

The radiation therapy degree program has been fully supported by all relevant organizations in its proposed transfer to the University of Alberta. Dr. Paul Grundy, the senior medical director and senior vice president Cancer care, AHS, has written an enthusiastic letter of support, committing the continuation of the use of resources at the CCI and the TBCC to support the clinical education and clinical practical components of the degree. It is anticipated that the training linear accelerator and the training CT simulator will also be housed in purpose-built space in the basement of the CCI. The CAMRT has, for many years, identified as a priority the introduction of degree preparation for radiation therapists, and has also provided support guidance and helpful advice on the structure of the program. In addition, the faculty at the Michener Institute in Toronto have provided considerable support and guidance in helping us establish the parameters of the program. Radiation therapy across the country is a small discipline and community, and collaborative support between the different universities is important in allowing the establishment of centres of excellence. Letters of support are included in Appendix C.

24. Provide evidence that employers will provide sufficient placements to support the clinical, co-op and work experience requirements of the program.

The current education course for radiation therapists utilizes clinical placements at the CCI and the TBCC. The increase in student numbers over the current cohort can be supported at these two facilities, provided additional clinical preceptor positions are created, and provided that, as numbers ramp up, the new radiation oncology centres in Lethbridge, Red Deer and Grande Prairie can be utilized. The additional clinical preceptors have been included in the budget, and discussions have taken place with Radiation Services Council, Cancer Care AHS, to ensure that the increased student load can be accommodated within the proposed centres. The letter from Dr. Grundy supports this, and we are providing additional documentation from Dr. Peter Craighead who is chair of the Radiation Services Council. Letters of support are included in Appendix C.

25. Describe the opportunities graduates will have for progression to further study in this field or in professional fields. Provide evidence of consultation.

The Ministry of Health and AHS have identified support for Advanced Practice roles. During workforce-planning exercises for the Radiation Therapy Corridor (RTC), Advanced Practice Radiation Therapists were included for Lethbridge, Red Deer and Grande Prairie as well as TBCC and CCI. The Canadian Association of Medical Radiation Technologists (CAMRT) has recently completed a broad validation survey of an Advanced Practice Competency Framework for radiation therapists and they are in the mid-stages of developing the national certification process.

It is proposed that an MSc be established, to start in year four of the program that will lead to opportunities for advanced practice certification, based upon the recommendations of CAMRT. Within the degree there will be expanded instruction in cancer biology and radiobiology, in addition to advanced clinical training to enable the practitioner to succeed in an advanced practice setting. There will be an expectation of a dissertation related to the field.

26. Are there any resource implications (budget, information technology (IT), library (Library Impact Statement), laboratory, computers, space, practicum liability insurance, student services, administrative services (eg, Registrar's Office), as applicable) for the proposed change, and, if so, where will those resources come from? Provide a budget for any long-term or one-time implementation costs. Provide detail and evidence of consultation with affected unit(s) and/or appropriate University officers/committees.

One-Time Program Costs (detailed in Appendix L)

Space and renovations:
There is a need in Edmonton for one classroom that will house an Immersive VERT simulation system with classroom setup to accommodate 30 - 35 students. This is a 3D virtual linear accelerator that provides extensive preclinical teaching to students prior to advancing to a physical simulator at the Cross Cancer Institute. It has become an essential tool in radiation therapist degree offerings across the country and internationally. As well, breakout classrooms will be required for problem-based learning, and also to provide individual students with one-to-one mentoring. A fifty-seat computer simulation laboratory will also be established to facilitate teaching in radiation therapy treatment planning, in cross-sectional anatomy and in the principles of imaging for radiation therapy. Once this laboratory is established it will become a significant FoMD resource, with utilization by radiation oncology and radiology residency training programs in the first instance. Administrative office space, including offices for seven part- and full-time faculty, will be required. Space has been obtained and designed in University Terrace for the didactic program. In Calgary, no additional space will be required over and above that which is currently used for the diploma program.

Specialized technologies needed for program implementation:

Simulation technology: Simulation technology: One 3D projection linear accelerator clinical teaching simulator is required for the Edmonton campus. An additional laptop version of this equipment will be required for Calgary. These simulators are essential components of the didactic and clinical elements of the education program, preparing the students for training on clinical units, and alleviating the disruption of clinical flow within the two cancer centres (detailed in Appendix G http://www.vertual.co.uk/).

Radiographic full-body phantoms: One phantom will be required in both Edmonton and Calgary to support didactic and clinical practicum education without disrupting clinical flow within the two cancer centres, and allowing teaching in the environment of a linear accelerator and CT simulator before entering the clinical environment. They are critical components of both the didactic and clinical elements of the education program (detailed in Appendix H).

CT scanner: CT: One helical CT scanner is required for teaching treatment planning. All patients requiring radiotherapy undergo CT imaging ("simulation") to generate the CT image data utilized in radiotherapy treatment planning. Students will acquire the practical hands-on skills for radiotherapy simulation of anthropomorphic phantoms using the dedicated teaching CT scanner, avoiding the need for disruption of clinical activity flow on the clinical CT simulators at each site (detailed in Appendix I).

Linear accelerator (linac): One educational linac is required for teaching purposes. The megavoltage capabilities are deactivated on this teaching unit, which is otherwise identical to units used in clinical practice. Students require substantial hands-on practical experiential learning opportunities on linac equipment, and over the course of the diploma program, students have obtained these opportunities on the clinical linacs. With the expanded numbers of students,

this will place a very heavy burden upon the clinical sites, and we believe that it would be impractical to offer the program without this educational system. This has certainly been the experience at the Michener Institute, who have noted that the quality of the teaching to individual students is significantly enhanced, whilst impact in the clinical environment is significantly reduced. Some, very limited shielding is required for this system as kilovoltage imaging capabilities remain operational.

MedSIS and Moodle: The Faculty of Medicine & Dentistry has implemented an integrated student and learning management system that facilitates student-administrative and course-delivery technologies. The MedSIS system is primarily intended for administrative purposes. It manages and individualizes: student records, class times, locations and descriptions of lecturers. It enables the collection of metrics, such as lecturer evaluation, curriculum mapping, course evaluation and student experience/performance data, which all feed into the program evaluation process. Individual lectures present in the student calendar link to Moodle if there are any materials related to the lecture.

FoMD's version of Moodle, (Learning Management System), which is a copy from the central U of A academic systems, has been altered to enable integration with MedSIS. Moodle is used to contain instructional materials such as: multimedia interactivities, videos, lecture recordings, blogs, wikis, self-study quizzes, discussion forums and the like. Additional uses for the system are emerging as needed, such as: collaborative meetings environments, leveraging its discussion forums and chat tools, as well as being used for document repository or common curriculum repositories (detailed in Appendix J).

The University architect and the FoMD director of facility planning have developed a renovation plan for University Terrace that will accommodate the needs of the program. These plans are included in Appendix J, and comprise the needed space for the didactic elements of the program, and also of the computer laboratory.

Should the training linear accelerator and the training CT simulator be approved, our first approach will be to install them in the basement of the Cross Cancer Institute. Conceptual drawings have been developed by the CCI, and are included in Appendix J. This would be our first choice for installing these two teaching items, as they provide ready access to the clinical units, and to the clinical simulation environment. This adjacency will provide significant clinical preceptorships advantages to the students and to the clinical preceptors, and could also provide opportunities for initial equipment exposure to radiation oncology residents. The decision to proceed with this placement will require agreement from Alberta Health Services, and assumes that the space will not be required as part of the current CCI renovations. We are currently evaluating backup sites for this facility, but anticipate that a decision will be made with respect to the CCI space within the next two months.

The costs for the training linac and for the training CT were not included in the original cost estimates submitted to Enterprise and Advanced Education; at that time we had not completed a site visit to the Michener Institute, and so were unaware of the availability of a training linac. During the site visit, the Chair of the Radiology Therapy Program at The Michener Institute pointed to the experience at the Institute over the past fifteen years of delivering their program. She noted that the investment in state-of-the-art technology greatly improves the learner experience, and also significantly improved the ability of the students to integrate rapidly into the clinical environment. Approximately three years ago they invested in two training linear accelerators and one CT scanner for CT simulation training. They noted that the ability to offer the learners this hands-on training significantly improved the quality of the graduates, and also significantly improved the impact of the learners out once they entered the clinical

realm. Based upon our experience at this site visit, we have included one training CT simulator and one training linear accelerator for teaching purposes at the Cross Cancer Institute. In acquiring this technology we will provide the students an opportunity to gain the practical hands-on skills required for the clinical environment using radiotherapy simulation of anthropomorphic phantoms and volunteers. (Space requirements and costs are detailed in Appendix F).

IT Infrastructure:

A clinical IT infrastructure assessment has been undertaken to ensure robust learner access to the current Alberta Health Services clinical radiotherapy treatment planning system (TPS). In addition, there will be need for a teaching PACS infrastructure to support the courses in cross-sectional anatomy and principles of imaging for radiation therapy. We anticipate that this PACS system will also be heavily used by residents in radiology and in radiation oncology, as this will provide a unique resource for training these residents. IT support will be provisioned primarily by the Faculty's MedIT unit, with support from AHS and vendors. This will include desktop, AV and video conference support for all teaching spaces, such as simulation classroom, computer lab, problem based learning rooms and administrative offices.

Curriculum Development:

Phase I RADTH Course Development: There will be costs associated with the development of a new curriculum moving from the two-year diploma program to the degree program. Twenty-one new courses will need to be development prior to 2014. New faculty with specialisations in medical physiology, radiation biology, anatomy and radiation oncology will be recruited to lead this development (detailed in Appendix E).

Phase II e-Learning Program for Upgrading of Current Radiation Therapist to Degree: The students in the current education program, recent graduates and current practitioners will be offered the opportunity to upgrade by accessing e-Learning courses. At the present time, there are no bridging programs for radiation therapy education within Canada. There have been inquiries from practitioners within Alberta, as well as from several provinces, asking whether a bridging program will be offered. Students in the current program and recent graduates will be the most affected by the transition to a degree credential. Therefore, providing upgrade options is vital to ensure knowledge and skill parity across the province. The majority of individuals accessing the bridging program will be practicing and unable to access full-time, face-to-face traditional class models. E-learning will allow for working professionals to access upgrading courses within their own communities and at a time convenient for them. The program will be condensed into two years of part-time study, facilitated using mediated communication technologies and the faculties two e-Learning platforms; MedSIS and Moodle.
Course development and faculty training/support is available from a Teaching and Learning Specialist and Academic Technology Specialist. Additional resources for course delivery and support reside within the Faculty's core Academic Technology unit.

Phase III Expansion of Program to Masters and Advanced Practice: With the shift to advanced practice roles and the development of a national advanced practice competency framework and certification process, it is important to begin to develop a Master's degree program to support the depth and breadth of knowledge, skill and judgment required for such role. The Master's degree requires expertise that exists within the FoMD, the clinical cancer care environment and expertise that will be recruited for the new baccalaureate degree.

Program Transition Costs:
There will be fees associated with accreditation changes, transition of historical academic and program records, the development of a comprehensive communication plan that includes notification of change of program to stakeholders and general public, website development and program brochures, etc. In addition, promotion of the degree via the Registrar's Office will begin in Fall of 2012. The creation of promotional materials for recruitment, a website and other communication tools will be used. Inclusion in the university calendar will not occur in 2013 due to missed deadlines.

Scientist Start-up Costs:
Be ready biologist and the cancer biologist will have typical 40:40:20 job descriptions, with expectations of establishing a research laboratory, and of being successful in establishing a research program at the University. In order to recruit scientists who have research and teaching skills it will be necessary to offer start-up costs to enable them to establish their laboratory-based research. We have anticipated the start-up costs as $200,000 per scientist. In addition the medical physicists will also be expected to build clinical research careers; we believe that it will be important to facilitate this by offering start-up costs to enable them to develop their own clinical research through the recruitment of students and residents. For the medical physicists we anticipate start-up costs will be $100,000 per physicist.

Facilities and Equipment:
There is a need in Edmonton for general office space, including academic offices for full-time and part-time faculty, and associated administrative support spaces. Teaching/learning space, including: one computer lab for 25 students; two small computer labs for 6-8 students; one classroom that will house the linear accelerator simulation (VERT) system and accommodate up to 30 students (for multipurpose use); and access to an additional shared use classroom for didactic teaching to accommodate up to 30 students will be required. The Office of the University Architect has identified appropriate space within the University Terrace building to accommodate these needs. As well, the program will require access to Objective Structured Clinical Examination (OSCE) rooms. This space already exists on campus in the Zeidler Ledcor Centre and in the Edmonton Clinic Health Academy and so no additional space is required for OSCE.

Office furnishings including desks, hutches, computer stands and filing cabinets will be required for the Edmonton academic and support staff administrative space. As well, computers, printers, audio visual equipment, fax machines and photocopiers will be required for the program in both the administrative and teaching spaces.

In Calgary, AHS Cancer Care currently provide office space for Radiation Therapy instructors and also a meeting room for clinical teaching during practicums so no additional space is required. We will require a lap-top linear accelerator simulation (VERT) system that can be used in the meeting room.

A clinical IT infrastructure assessment has been undertaken to ensure robust learner access to the current Alberta Health Services clinical radiotherapy treatment planning system (TPS).

Program Development:

> **Curriculum Development:** There will be costs associated with the development of a new curriculum moving from the current two-year diploma program to the degree program. This will also include marketing and advertising of the new program.

Faculty Recruitment: There will be advertising, search and selection and relocation costs associated with the recruitment of the new faculty of the program. In order for us to attract highly qualified and to be competitive in the current market, we will need to provide $100,000 to each medical physicist to establish their academic and research programs. As well, in order to attract a highly qualified Radiobiologist and Cancer Biologist and to be competitive in the current market place, we will require $200,000 each to establish their respective research laboratories and research programs.

Project Manager: A Project Manager will work with the Steering Committee and will be responsible for the coordination and facilitation of all developmental aspects of the RADTH program. This position will be required immediately and will continue for approximately one year.

Ongoing Program Costs (detailed in Appendix L)

Faculty:

Program Director: The program director (PD) will monitor the components of the integrated provincial program structure to ensure support and direction for program staff and faculty. The PD will oversee the recruitment process for academic and clinical instructors as well as administrative staff. The PD will be responsible for operations of both the clinical and didactic components of the RADTH, and will work collaboratively with the clinical RT departments to support the clinical sites. The PD will monitor the overall program, including review of clinical, student, instructor/faculty and preceptor metrics. The PD will ensure that the academic program is reflective of current clinical practice.

Radiation Therapists: Projected enrolment for the RADTH will increase from initial levels of 15 students per year to a maximum of 20 students per year, necessitating an increase of the current faculty complement of 5.5 FTE to, eventually, 11.5 FTE. Increased teaching demand, expanded program length, curriculum expansion and integrating clinical simulation teaching methodologies require these additional therapist faculties. In addition, support for existing faculty who are completing advanced credentialing to meet university-level qualification is required.

Radiation Oncologist: A 1.0 FTE radiation oncologist will be an advisor to the curriculum development committee. This academic clinician educator will share didactic and clinical teaching responsibilities for the principles and practice of radiation oncology, general interdisciplinary oncology and cancer radiotherapy treatment planning. Although all members of the Division of Radiation Oncology hold **Special Continuing Appointments** with the FoMD, there are currently no University-funded radiation oncologists in the Department of Oncology.

Medical Physicists: 2.0 FTE medical physicist faculty (rank-based salary): advisory to the curriculum development committee. These academic medical physicists will share didactic responsibilities for a variety of new courses for the new program – medical physics, equipment and instrumentation, radiation protection and safety, and radiation treatment planning and dosimetry. They will also be responsible for practicum and clinical training in the physics of radiation therapy.

Radiobiologist: A 1.0 FTE radiobiologist will be advisory to the curriculum development committee and will have a background in molecular or cellular radiobiology, radiobiological modeling and/or biophysics. He/she will share didactic teaching responsibilities for radiation

therapy undergraduates and will be responsible for the development and teaching of courses, which will include introductory radiobiology and advanced radiobiology and will also be involved in the creation of the Master's degree program. These courses will also be available to radiation oncology and medical physics residents and to undergraduates across campus. A potential candidate for this position has been identified.

Cancer Biologist: A 1.0FTE cancer biologist (rank based salary): the advisory to the curriculum committee, this faculty member will advise on the development of core cancer biology teaching to the student cohort. This will initially involve the development of one new course, which could well be offered to the wider University community, and also to help develop and research methodology teaching and help with research projects in year four of the program. Once the baccalaureate program is up and running, it is anticipated that this faculty member will be involved in the Department to further courses, related to the MSc advanced practice program as it is developed.

Anatomist: Anatomist faculty: (rank-based salary): advisory to the curriculum development committee, this faculty member will advise on the development of two anatomy courses that will be directed at the radiation therapy students. One of these will involve the teaching of gross anatomy, and the other cross-sectional anatomy, to provide the students with the necessary background to be able to understand distribution of dose within the body, and organ relationships with respect to that dose distribution. In addition, the anatomist will assist clinical faculty in the principles of imaging course through reinforcement of cross-sectional anatomy principles.

Teaching and Learning Specialist: The teaching and learning specialist (APO) will work with faculty in the design and development of curriculum for the undergraduate, Phase II e-Learning Bridging and Master's programs. He/she will be skilled in the use of innovative pedagogy and instructional technologies for teaching, and in assessment and evaluation methodologies, data collection and needs assessment data gathering.

Support Staff:

Academic Technology Specialist: The academic technology specialist (.5 FTE) will work with the faculty web programming specialists, project managers and related staff in the preparation of the courses in RADTH. He/she will assist in the development of courses for e-Learning delivery.

Administrative Support: There will be a need for three FTE positions at the start of the RADTH; this will be increased to four FTEs, based on program expansion in 2015. There will be a significant increase in administrative support required for the new degree program, the bridging program for existing practitioners and recent graduates, and the planning of the Master's program. Student numbers will rise, the program length will increase and the complexity of clinical placements will increase. There will be a large role for administrative support as the new program prepares for the Canadian Medical Association Accreditation that will span a number of years for full accreditation. Administrative support will be vital for the set up and maintenance of the MedSys learning management system, which will provide student schedule support, instructor course material, metrics, evaluation data, etc. There will also be the need for administrative support for recruitment of staff, payroll and operational and financial management of the program funding.

Educational Services and Supplies:

Learner Support: The Office of Learner Advocacy & Wellness (LAW) ensures learners in the Faculty of Medicine & Dentistry at the University of Alberta have a voice in issues that affect their professional and academic lives. The office also promotes balance, resilience, and the provision of adequate supports and accommodation when barriers to achievement arise. LAW provides services on a confidential basis, so the office is a safe place for learners to go to when they have academic or personal issues. Included in the annual fees associated with providing this service are additional fees to support aboriginal learners in the program.

Program Materials and Supplies: Program funding for administrative and operational supplies, photocopier and computing supplies for all sites involved in the program are required annually.

Library Services: Fees for UofA Library Services, Program books and subscriptions are required annually.See Appendix M for Library Impact Statement.

Software Upgrades: Annual software upgrades will be required for the VERT, Eclipse, CT and simulator.

e-Learning Supplies and Sundries: Office supplies, communications, computer and teaching technologies for eLearning is required to support the distance learning component of the program.

Other Direct Costs

Travel: As student clinical practicums are located at multiple sites including Edmonton, Calgary and eventually Grande Prairie, Red Deer and Lethbridge, meetings by teaching faculty at these respective sites will be required. As well, teaching faculty will need to travel to attend national meetings of the licensing body and to collaborative meetings of the other radiation therapist degree programs in Canada.

Student Educational Informatics and Learning Management Systems: MedSIS and Moodle MedSIS and Moodle are the FoMD's educational informatics and learning management systems. A fee for the maintenance and upgrading of this system is required on an annual basis.

Student Liability Insurance: As a student registered in the University of Alberta, the RADTH students are covered under the University's student liability policy.

Additional Questions – University of Alberta

19. How will this proposal distinguish the University of Alberta from other post-secondary institutions?

The radiation therapy degree program will require a complex mix of educational experiences for the student. The pre-professional year has been carefully designed to present the student with the necessary background science, interaction skills and exposure to the University environment to enable them to succeed in the three years of the professional degree. The expectations on the student in these three years are significant; they will be exposed to a scientific environment that is specific to the management of patients with cancer, and also to the necessary skills to understand clinical interactions, risk and benefit in treatment decision-making and the techniques and technology used in radiation oncology. They will also

have clinical interactive teaching that will enable them to complete the degree with the necessary skills to challenge the national certification examination. Their education will have the same expectations as other clinical disciplines within the University.

The University of Alberta is uniquely placed to provide this holistic educational experience. The Department of Oncology has, since its inception, been fully integrated into the clinical services at the CCI. There is a wealth of experience in educating clinicians; the department is involved in undergraduate, graduate and residency education, and has recently passed accreditation in five separate clinical disciplines (medical oncology, radiation oncology, palliative care, medical physics (therapy) and medical physics (nuclear medicine). Teachers within the Department have extensive experience in cross disciplinary collaboration, cross disciplinary research and cross disciplinary education. The interaction with clinicians and patients on a daily basis provides an opportunity for learners to not only understand the principles of cancer management, but also, most importantly, to learn the principles of compassion and communication in an active treatment environment. This environment will provide ample opportunity for growth of the program, and the on-campus education experience will be a major opportunity to allow the rapid development and growth of a Master's program leading to advanced-practice certification.

20. How will research, scholarly work, and teaching be integrated to enhance student learning?

The Department of Oncology is primarily situated in the CCI. In this environment, there is effective functioning of a comprehensive cancer centre where discovery, translational and clinical research is integrated into an environment where routine care is offered to patients. The CCI sees approximately 6,000 new patients annually, and about 40 per cent of these attend for radiation therapy. There is a large, very active clinical research program with approximately 10 per cent of new patients being entered into clinical trials (this is a significantly higher percentage than is found in most other cancer centers in the country). Of particular importance to this program is an active, innovative program in image-guided adaptive radiotherapy; this is a complex three-dimensional radiation delivery modality that improves patient outcomes and reduces morbidity. Members of the Division of Radiation Oncology are also significant accruers to Radiation Therapy Oncology Troup clinical trials.

The radiation therapy degree is a highly integrated learning experience, with learners being involved in didactic, small group, problem-based learning and learning in the clinical environment. There is a culture within the Department of integration of scholarly activities and research into learning activities, and in the fourth year, there is a formal course related to research in radiation oncology, with an expectation that the students will present the results of their own research activities.

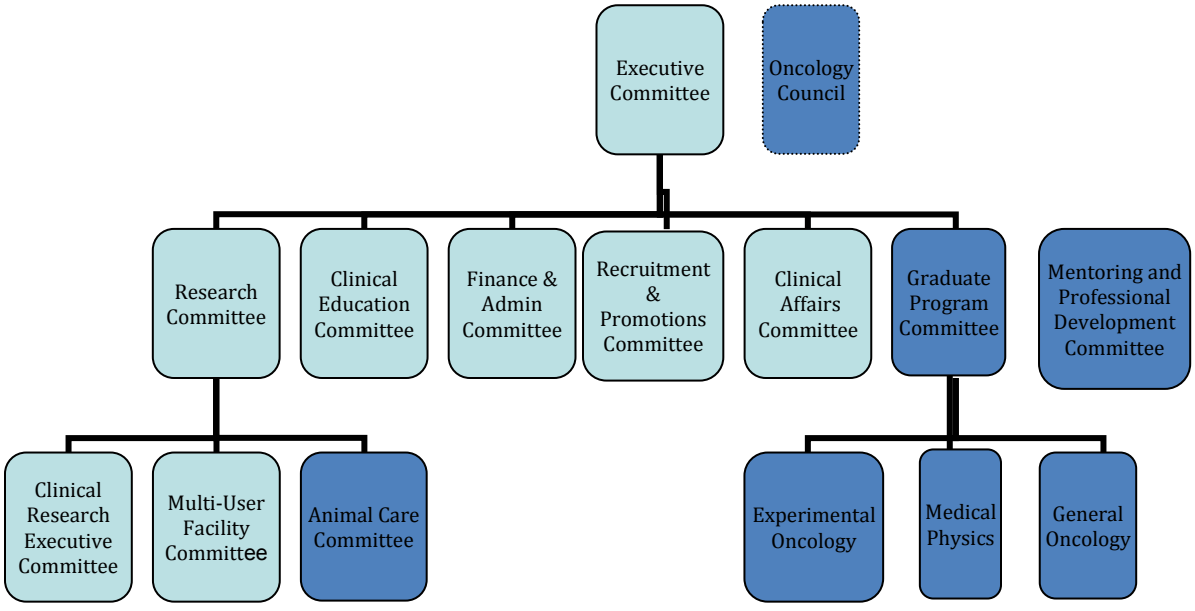
There is a very active seminar and rounds program in the Department, and students will be encouraged to attend as many seminars and rounds as is possible. In addition each of the tumor groups, which are the core functional units responsible for managing different types of cancer, hold tumor boards on a weekly basis. In the appropriate parts of the course, radiation therapy students will be expected to attend these tumour boards, which will provide them with insight into best practices, clinical treatment algorithms and the concepts of risk benefit ratio in patient management.

Expectations on the students will be high for attending, understanding and integrating with the research and clinical environments in the Department of Oncology, and there will be major opportunities for feedback on the management of medical issues, and clinical interactions, interactions with family and interdisciplinary collaborations.

21. Further to Question #15 above, when should a thorough evaluation of the program (if applicable) be conducted? What should be the composition of the evaluation team that conducts a thorough evaluation (enter information on types of personnel and not actual names)? How will feedback from students, employers, and other interested parties be integrated?

Program evaluation will be conducted at several levels, and will involve both internal and external evaluations. There is a mandatory requirement that the program is accredited by the Canadian Medical Association Conjoint Accreditation Services; provisional accreditation will be required before teaching commences, and after the first two years of operation. If this is successful, an additional four years will be granted. Subsequently accreditation will be performed on a cycle of six years. Internally, a number of tools will be used to evaluate the program, including the normal instructor evaluation process, preceptor evaluations and Metrics MedSIS. As the baccalaureate program is being introduced to provide a long-term solution to an identified need it will also be important that consultations with stakeholders, particularly Alberta Health Services, Alberta Health and Wellness and Enterprise and Advanced Education occur regularly to ensure that the goals of the program are being met, and that the quality of the graduates is appropriate for the clinical service needs of the province. We believe that this latter review should occur every year during the initial five years of the program to ensure that what has been developed is meeting these needs. Thereafter, we believe that the program could be evaluated on the same cycle as the CMA accreditation.

In the evaluations of the program will be reviewed by the departmental clinical education committee; our departmental committee structure is outlined below. The clinical education committee reports through the executive committee to the Chair, and is responsible for reviewing and the non-research intensive graduate program within the Department. We believe this committee has the internal expertise and experience to be able to provide the Chair and the Dean with appropriate guidance as to the effectiveness of the baccalaureate, and subsequently the Master's program.



Appendix A: Faculty of Medicine & Dentistry, Radiation Therapy - Admission and Readmission Deadlines

IMPLEMENTATION FOR 2013/2014

12.7 Admission and Readmission Deadlines

Contact the Faculty office prior to applying.

Medicine and Dentistry							
	Admission			Readmission			Other Requirements
	Application	Documents		Application	Documents		
BSc in Radiation Therapy							
Fall Term	March 1	April 1 (see note 1 & 2)	June 15 (see note 3)	March 1	April 1 (see note1 and 2)	June 15 (see note 3)	Career Reflection Letter April 1 (see §15.9.10) Interview
Winter, Spring, and Summer Terms: No admission or readmission							

Appendix A: 15.9 Faculty of Medicine & Dentistry, Radiation Therapy - Undergraduate Admissions

IMPLEMENTATION FOR 2013/2014

13.5.4 Deposits on Confirmation of Admission	**13.5.4 Deposits on Confirmation of Admission**
Upon notification of admission, successful applicants to certain programs are required to remit a nonrefundable deposit to the University to confirm their admission. The deposit will be credited toward payment of tuition upon completion of registration. The following undergraduate programs require a deposit:	Upon notification of admission, successful applicants to certain programs are required to remit a nonrefundable deposit to the University to confirm their admission. The deposit will be credited toward payment of tuition upon completion of registration. The following undergraduate programs require a deposit:
Doctor of Dental Surgery (DDS)	Doctor of Dental Surgery (DDS)
Diploma in Dental Hygiene	Diploma in Dental Hygiene
Bachelor of Laws	Bachelor of Laws
Doctor of Medicine (MD)	Doctor of Medicine (MD)
	Bachelor of Science in Radiation Therapy
Bachelor of Science in Medical Laboratory Science	Bachelor of Science in Medical Laboratory Science
Bachelor of Science in Pharmacy	Bachelor of Science in Pharmacy
Applicants should contact specific Faculties for more information about deposits, including specific amounts. Applicants who have paid an admission confirmation deposit are not required to pay an additional confirmation deposit upon registration (See §22.1.6)	Applicants should contact specific Faculties for more information about deposits, including specific amounts. Applicants who have paid an admission confirmation deposit are not required to pay an additional confirmation deposit upon registration (See §22.1.6)
	15.9 Undergraduate Admissions
	15.9.10 Bachelor of Science in Radiation Therapy
	Entrance Requirements **I. Preprofessional Year** Those wanting to enrol in the BSc Radiation Therapy program must complete a preprofessional year before applying for admission to the Faculty. The required courses or their transfer equivalents are available at various post-secondary institutions in Alberta. Preference will be given to Alberta

	applicants; however, applicants from other provinces may also be considered. Students should, where possible, take the preprofessional requirements (equivalent to *30 at the University of Alberta) as one year of full-time study. **II. Academic Requirements** A minimum of *30 are required. The appropriate courses would include the following: (1)English (*3) (2)Human Anatomy (*3) (3)Physics (*6) (4)Psychology and/or Sociology (*6 in any combination) (5)Mathematics (Calculus) (*3) (6)Cell Biology *3) (7)General Chemistry (*3) (8)Organic Chemistry (*3) **III. Other Requirements** **(1) Selection Process:** A minimum GPA of 3.2 is required in preprofessional course work. All preprofessional courses are prerequisites for senior courses, thus deficiencies would normally have to be made up. Deficiencies will be assessed and a plan of action will be identified by the Radiation Therapy program office. The selection process is competitive, and applicants will be ranked primarily on academic achievement in the prerequisite courses. Other factors considered in ranking include overall academic achievement (emphasizing recent academic performance), a demonstrated ability to perform well in a consecutive Fall/Winter session of full-time study (preferably *30 units), a personal interview, and a career reflection letter. (2)**Spoken Language Requirement**: Besides demonstrating overall English language proficiency, students need a further level of spoken English proficiency regardless of their citizenship status or country of origin. (See §13.3) (3) **Career Reflection Letter**: Applicants

	must submit a career reflection letter outlining evidence of personal reflection regarding their career choice, professional goals, personal skills and attributes, knowledge of the profession, related experience, and reasons for seeking admission to the Radiation Therapy program. (see §12.7) (4) **Personal Interview**: Interview selection is based on postsecondary academic records and a career reflection letter received by April 1 (see §12.7). Selected applicants will be interviewed to determine if they have the personal qualities necessary for the profession. The interview evaluates an applicant's empathy, communication, teamwork, reflection, conflict resolution, responsibility, initiative, problem-solving, prioritization and organization. Short-listed applicants will be advised of the interview date. (5)**Criminal Record Check**: Applicants should be aware that under the Alberta Protection of People in Care Act, they will be required to satisfy a criminal record check once they are accepted into the Radiation Therapy program (Refer to §23.8.3.) **(6) Final Selection:** Final admission decisions are made by the Radiation Therapy Admissions Committee **(7) Deposit:** Upon notification of acceptance, applicants will be required to confirm their intention to register by submitting a nonrefundable deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.
15.9.~~10~~ MD/PhD Program Highly qualified students motivated toward a career in medical research may wish to consider the MD/PhD program. This program is described in the Medicine and Dentistry as well as the Graduate Programs sections. **15.9.~~11~~ MD/MBA Program** The Faculty of Medicine and Dentistry and the Faculty of Business offer a	**IV. Aboriginal Applicants** The Department of Oncology will provide up to one position within the quota for the BSc Radiation Therapy program to Aboriginal applicants. Students of Aboriginal ancestry within the meaning of the Constitution Act, 1982, Section 35, Part 2, or a person accepted by one of the Aboriginal peoples of Canada as a member of their community, will be

program of combined study which permits highly qualified students to earn both the MD and MBA degrees in five years. Each student must apply separately to the Faculty of Medicine and Dentistry (for admission into the MD program) and at any time in the first two years of the MD program, may apply to the Faculty of Graduate Studies and Research (for admission into the MBA program).	considered in this category. Candidates will be subject to normal minimum admission requirements as outlined in §15.9.10 and approval by the Divisional Admissions Committee. If there are no qualified Aboriginal applicants in any given year, the position will be allocated to the general applicant pool. Aboriginal applicants should contact the Department of Oncology in the Faculty of Medicine & Dentistry for career planning. **15.9.11 MD/PhD Program** Highly qualified students motivated toward a career in medical research may wish to consider the MD/PhD program. This program is described in the Medicine and Dentistry as well as the Graduate Programs sections. **15.9.12 MD/MBA Program** The Faculty of Medicine and Dentistry and the Faculty of Business offer a program of combined study that permits highly qualified students to earn both the MD and MBA degrees in five years. Each student must apply separately to the Faculty of Medicine and Dentistry (for admission into the MD program) and at any time in the first two years of the MD program, may apply to the Faculty of Graduate Studies and Research (for admission into the MBA program.) **23.5.5 Reexaminations** **(2) Reexaminations are Not Permitted: no changes until…….** h. Faculty of Medicine and Dentistry Bachelor of Science in Radiation Therapy: for students who fail any clinical course in the Radiation Therapy program (see §113.2.6)

112 General Information **Medical Programs** (1) A fully accredited four-year program leading to the degree of Doctor of Medicine. At least two pre-medical years at university are required before admission to this program. (2) A program whereby students in the MD program who fulfil specified requirements in research may receive the degree of Doctor of Medicine "with Special Training in Research." (3) A four-year program leading to the degree of Bachelor of Science in Medical Laboratory Science, which may be entered after a preprofessional year. (4) A program whereby students in Medical Laboratory Science who fulfil specified requirements in research may receive the degree of Bachelor of Science in Medical Laboratory Science "with Honors in Research." (~~5~~) A program whereby students in the MD Program who fulfil specified requirements may be awarded the Bachelor of Medical Science degree at the conclusion of their second year in the MD program. ... **112.2 Affiliated Hospitals and Institutions** **...** **112.2.7 Cross Cancer Institute** The Cross Cancer Institute is a tertiary cancer facility operated by Alberta Health Services (AHS) (the provincial health authority for cancer) that provides cancer services for northern Alberta and houses the Department of Oncology. The AHS and the University of Alberta conducts its cancer research and training programs through an	**112 General Information** **Medical Programs** (1) A fully accredited four-year program leading to the degree of Doctor of Medicine. At least two pre-medical years at university are required before admission to this program. (2) A program whereby students in the MD program who fulfil specified requirements in research may receive the degree of Doctor of Medicine "with Special Training in Research." (3) A four-year program leading to the degree of Bachelor of Science in Medical Laboratory Science, which may be entered after a preprofessional year. (4) A program whereby students in Medical Laboratory Science who fulfil specified requirements in research may receive the degree of Bachelor of Science in Medical Laboratory Science "with Honors in Research." (5) A program whereby students in Radiation Therapy who fulfill specified requirements may receive the degree of Bachelor of Science in Radiation Therapy. (6) A program whereby students in the MD Program who fulfil specified requirements may be awarded the Bachelor of Medical Science degree at the conclusion of their second year in the MD program. ... **112.2 Affiliated Hospitals and Institutions** **...** **112.2.8 Tom Baker Cancer Centre** The Tom Baker Cancer Centre is a tertiary cancer facility operated by Alberta Health Services (AHS) (the provincial health authority for cancer) in Calgary that provides cancer services for southern Alberta and houses the Department of

affiliation agreement. ... **112.2.8 Tom Baker Cancer Centre** ... **112.3 Registration and Licensing**	Oncology. The AHS and the University of Calgary conducts its cancer research and training programs through an affiliation agreement. **112.3 Registration and Licensing** **112.3.4 BSc in Radiation Therapy** The Canadian Association of Medical Radiation Technologists (CAMRT) is the organization that provides the national certification examination and competency profile. Students are eligible to access the CAMRT examination upon completion of all program requirements. Under the Alberta Health Professions Act, radiation therapists must be licensed by the regulatory college, Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) to practice in Alberta. The ACMDTT endorses the CAMRT national examination as the certifying examination. After successful completion of the CAMRT national certification examination, graduates are eligible to access the American Registry of Radiologic Technologists' (ARRT) certification examination.
113 Admission and	**112.4 Finance** **112.4.7 BSc in Radiation Therapy** Tuition fees for the program can be found in §22.2. Note: The figures are based on 2012-2013; figures are subject to change without notice. National Certification Examination fees are payable to the Canadian Association of Medical Radiation Technologists. http://www.camrt.ca/certification/international/ It is mandatory that all students are student members of the Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) and must pay the student membership fee http://acmdtt.com/Registration/StudentApplicants.aspx http://www.camrt.ca/membership/membershipcategories/

Academic Regulations	113 Admission and Academic Regulations
113.1 Admission See §§13 and 14 for general admission requirements to the University. See §15 for specific admission information for the DDS, Dental Hygiene, MD, ~~and~~ BSc in Medical Laboratory Science programs.	**113.1 Admission** See §§13 and 14 for general admission requirements to the University. See §15.9 for specific admission information for the DDS, Dental Hygiene, MD, BSc in Medical Laboratory Science and BSc in Radiation Therapy programs. **113.2.6 Bachelor of Science in Radiation Therapy** The following apply to students in the Bachelor of Science in Radiation Therapy. (1)Grades a. The means of assessing a student's progress and determining a student's grades may vary from one course to another, according to the nature of the course. Factors other than examination results may be used to a variable extent by instructors in determining grades. Students are informed at the beginning of each course how grades are to be determined. b. Students must satisfactorily complete all components of all courses. (2)Promotion and/or Continuation a. Progression in the program is term by term. Accordingly, all students in a particular co-hort of the program normally should be registered in the same courses in each term (§114.7.) Students will not normally register in any core (i.e., non-elective) courses from a particular term of the program until they have satisfactorily completed core courses from the previous term of the program. b. A student who is awarded First-Class Standing or Satisfactory Standing, as defined below, will normally qualify for

	promotion: First-Class Standing: Awarded to a student who obtains a GPA of 3.5 or above and passes all courses while enrolled in the full normal academic/clinical course load in that term. Satisfactory Standing: For promotion, a student must pass all courses and obtain a minimum GPA of 2.7 while enrolled in the full normal academic/clinical course load in that term. c. Conditional Standing: Conditional Standing will be assigned to a student who receives a grade of F, D, D+, C-, C, or C+ in any course within the program. A student who is assigned Conditional Standing will be placed on Academic Warning and must retake and pass the failed course. Other courses are to be taken, up to a normal course load, as scheduling permits and as approved by the Faculty. Students on Academic Warning as a result of acquiring Conditional Standing will clear their Academic Warning upon passing the repeated course and will qualify for promotion if they achieve Satisfactory Standing on the basis of all courses taken during the following term. Students who fail a course a second time will be required to withdraw from the program. d. Required to Withdraw: Any student who: i) fails more than one academic course per program year (program year includes Fall, Winter, and Spring/Summer terms) ii) fails any clinical course; iii) is unable to obtain a minimum GPA of 2.7 in any term; iv) is unable to clear their Academic Warning status is required to withdraw from the program. Such students are not normally readmitted to the program.

	e. Probation: Students who have been required to withdraw and who have successfully appealed that decision will be placed on Probation and required to repeat the full program year. To clear probation and qualify for promotion, the student must achieve Satisfactory Standing in all terms during the probationary year. Students who fail to do so will be required to withdraw. Any student in a probationary year who fails a course in Fall Term will be required to withdraw immediately and subsequent registration will be cancelled. Only one year of probation is allowed while registered in the BSc in Radiation Therapy program. 3. Clinical Performance: a. A student who is absent more than two clinical days in any one clinical course may need to make up the lost time before being allowed to continue in the program. b. The Program Director, or designate acting on behalf of the Program Director, may immediately deny assignment of a student to, withdraw a student from, or vary terms, conditions or site of a practicum/clinical placement if the Program Director or designate has reasonable grounds to believe that this is necessary in order to protect the public interest. (See §23.8.2 Practicum Intervention Policy) c. All students enrolled in the Radiation Therapy program are bound by, and shall comply with the Professional Codes of Ethics governing the profession and practice of Radiation Therapy. i)"Professional Codes of Ethics" means the current Canadian Association of Medical Radiation Technologists (CAMRT), Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT), and all other relevant professional codes and practice

	standards for Radiation Therapists. ii) It is the responsibility of each Radiation Therapy student to obtain, and be familiar with, such Professional Codes of Ethics and practice standards, and their amendments as may be made from time to time. (See §30.3.3 of the Code of Student Behaviour). Amendments to the Code of Student Behaviour occur throughout the year. The official version of the code of Student Behaviour, as amended from time to time, is housed on the University Governance website at www.governance.ualberta.ca 4. **Voluntary Withdrawal**: A student in the Radiation Therapy Program wishing to temporarily withdraw is required to make written application to the Radiation Therapy Program Director, stating the reasons for withdrawal. Readmission to the Radiation Therapy Program following voluntary withdrawal will be based on the following: a. Review, by the Faculty of the reasons for withdrawal and the student's academic record; b. Availability of a place, within quota, in the class to which the student is seeking readmission. Priority will be assigned in the following order: Students who have met normal promotion requirements. Faculty approved repeating students and students returning after voluntary withdrawal, in order of academic standing. c. The length of time the student interrupts studies leading to the Bachelors of Science in Radiation Therapy must not exceed one year in total. 5. **Faculty Advisor:** At the discretion of the Faculty, a Faculty advisor may be assigned to students having difficulty meeting promotion requirements. The method of assignment and the role of the Faculty advisor is determined by the faculty. 6. Reexaminations: See §23.5.5: a. Reexamination is not permitted in

	clinical courses. b. Students who fail more than one academic course in any full program academic year (Fall, Winter, Spring/Summer terms) are not allowed reexamination privileges. c. The Department of Oncology Education Committee must approve reexaminations. d. If a reexamination is approved, satisfactory completion of a remedial program may be required by the Faculty of Medicine & Dentistry Academic Standing and Promotion Committee before the student is permitted to take the reexamination. e. Students are advised that it is not possible to make a ruling regarding remediation or reexamination until all grades for a term are received and recorded. f. The weight of reexamination is at least that of the final examination. g. The reexamination mark (as in the case of a deferred mark) will replace the original final exam mark. h. Any student who, after reexamination and/or evaluation fails to meet promotion/graduation requirements is deemed to have failed the year and will not be allowed to continue in the program. i. A student who does not take a reexamination within the time period prescribed by the Faculty will not be allowed to continue in the program. 6. Graduation a. Academic Performance for Graduation: Students must achieve Satisfactory Academic Standing or First Class Standing in their final year of the program; successfully complete all program requirements; and present a graduation average of at least 2.7. The graduation average is a cumulative measure of a student's grade points obtained while

	registered in the program in all years and terms, including Spring/Summer. It is the quotient of (a) the total number of grade points earned by a student in courses credited to the degree and (b) the total weight of those courses. b. The notation of "With Distinction" is awarded to a graduating student who has obtained an average GPA of 3.5 or higher and no failing grades over the entire program. 7. Clinical Placement Policies and Requirements: All students must comply with all Clinical Placement Policies and Requirements. a. Valid certification of CPR (Cardiopulmonary Resuscitation) at the Healthcare Provider Level and the Basic Life Support Training (Level C) is required and must be maintained throughout the program. A CPR-Healthcare Provider certificate is valid for one year from the date of the course. Evidence of recertification in each subsequent year is required. b. Health Status: All students admitted to the Radiation Therapy Program must be capable of completing the physical activities and responsibilities required in clinical simulation and clinical practice. c. Medical Testing and Immunization: To ensure, insofar as possible, both student and patient safety, the Faculty requires immunization against, or proof of immunity to, poliomyelitis, diphtheria, tetanus, measles, mumps, rubella, and hepatitis B. As well varicella screening and a two-step tuberculin skin test in required in the first year of the program and should be performed by the University Health Center. Requirements: See §113.2.1(12). d. **Hepatitis B Virus (HBV)**: Hepatitis B

	antigen testing will be performed by the University Health Centre on all students after acceptance in to the program. Students who test negative for Hepatitis B surface antigen (HbsAg), Hepatitis B vaccination will be required. An exception will be made for those for whom is medically contraindicated or for those individuals who have proof of prior vaccination and test positive for antibody to Hepatitis B surface antigen (anti-HBs). After vaccination, students will receive a second test to determine if they have converted to produce the appropriate antibody titre. If they have not converted they will receive a second vaccination and again be tested. Those students who then fail to convert will be counselled as their potential risk status during training and future practice. For students who test positive for Hepatitis B surface antigen their "e" antigen (HbeAg) status and the presence of Hepatitis B viral DNA will be determined. If they are found to be positive for the "e" antigen or the viral DNA they will be counselled as to their risk of infecting patients. e. Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV): The data indicates that transmission of the human immunodeficiency virus (HIV) and Hepatitis C (HCV) from health care worker (HCW) to a patient in a health care setting is extremely rare, although transmission from patients to a HCW is more common. Therefore, all students accepted into the Faculty of Medicine and Dentistry are encouraged to undergo HIV and HCV testing upon admission and at any time during their program when concerns about infection have arisen, but testing for HIV or HCV is not mandatory at the time. **Note:** For updates on changes to medical testing and immunization refer to the

	Faculty Office. f. N-95 Respirator Fit Testing: Students are required to be fit tested for N 95 respirators. Check with the Faculty office for the procedures to schedule this fit testing. The associated costs are the responsibility of the student. g. Criminal Records Check: Students should be aware that under the Alberta Protection of People in Care Act, they will be required to satisfy a criminal records check Refer to §23.8.3. h. The Program Director, or Designate acting on behalf of the Program Director, may immediately deny assignment of a student to, withdraw a student from, or vary terms, conditions or site of practicum/clinical placement if the Program Director, or Designate has reasonable grounds to believe that this is necessary in order to protect the Public Interest. (See §23.8.2, Practicum Intervention Policy.)

114 Programs of Study ...	**114 Programs of Study** **114.7 Radiation Therapy Bachelor of Science Degree** General Information The Department of Oncology in the Faculty of Medicine & Dentistry at the U of A offers a undergraduate degree in Radiation Therapy. The program is designed to develop a competent, critical thinking, reflective radiation therapist who effectively contributes to the care of the patient with cancer and who is committed to excellence in professional practice. Program design support learners' progression from knowledge through skill acquisition to synthesis and competency. It also enables the development towards achievement of the described professional qualities of a radiation therapist by thinking, communicating, and acting in increasingly sophisticated ways. This degree prepares graduates to pursue post-baccalaureate or graduate programs that may lead to advanced practice opportunities. In addition, students will learn the foundations of research and engage in group research projects during the clinical component of the fourth year of the degree program. For admission information See §15.9.10. 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. **Program of Courses** Year 2 (1) ONCOL 253 (2) ONCOL 233 (3) CELL 201 (4) RADTH 205 (5) PHYSL 210 (6) ONCOL 243 (7) ONCOL 210 (8) ONCOL 234

	(9) ONCOL 254 (10) ONCOL 255 (11) RAHTH 260 Year 3 (1) ONCOL 335 (2) RADTH 301 (3) ONCOL 355 (4) ANAT 305 (5) RADTH 328 (6) ELECTIVE (7) ONCOL 310 (8) ONCOL 356 (9) ONCOL 306 (10) INT D 410 (11) RADTH 360 Year 4 (1) RADTH 401 (2) RADTH 460 (3) RADTH 411 (4) RADTH 461
	NEW ANAT 305 Cross-Sectional Anatomy *3 (*fi 6*)(first term, 3-0-2) A study of human gross anatomy from a regional perspective, with a particular emphasis on cross-sectional structure and three-dimensional relationships. Students will apply their knowledge to correlate prosected human cadaveric specimens with radiological images derived from a variety of techniques. This course is intended to prepare students who are considering a career in applied radiological imaging and radiotherapy. Prerequisite: ANAT 200 Human Morphology or permission of the department ONCOL 306 Imaging Principles/Pathology *3 (fi 6)*(second term, 3-0-0) An overview of the principles of medical imaging, including the principles of MRI, CT and PET imaging. Students will learn the

	relative advantages and limitations of the different techniques, and will be invited to apply the principles of cross-sectional anatomy to the identification of normal and abnormal structures seen in each of the different modality presentations. This course will prepare students for the 2 treatment planning courses, and will facilitate clinical interactions in the course of developing treatment plans, and treating patients on the linear accelerators. Prerequisite ANAT 305 Cross Sectional Anatomy ONCOL 210 Radiation Oncology I *3(*fi 6)* (second term, 3-0-0) The field of radiation oncology is introduced, definitions for the application of medical terminology is addressed as well as the evaluation and treatment of tumours with ionizing radiation. Students will begin the study of the various modalities of radiation treatment, and the respective treatment regimens and techniques utilized for the most common tumour sites. Prerequisite: Permission of the department ONCOL 253 Cancer Biology *3(*fi 6)* (first term,3-0-0) An introduction to the biology of cancer highlighting features that distinguish normal cells from cancer cells. Specific topics include the genetic basis of cancer, control of cell proliferation, invasion and metastasis, mechanism of action of cancer drugs and the development of resistance. Prerequisite: CELL 201 Cell Biology in Oncology ONCOL 233 Concepts and Applications in Medical Physics *3(*fi 6)* (first term, 3–0-0) Introduction into fundamental medical physics concepts including theory of atomic and nuclear structure, radioactivity, and electromagnetic and particulate radiation. Topics to be covered include production of medically useful radiation, interaction of radiations with matter, radiation dose, and

	an introduction to physics equipment used in a radiation oncology environment. Prerequisites: PHYS 124 Particles and Waves and PHYS 126 Fluids, Fields, and Radiation and MATH 113 Elementary Calculus I or MATH 114 Elementary Calculus I Or permission of the department ONCOL 234 Medical Physics Equipment and Instrumentation *3(*fi 6)* (second term , 3-0-0) Builds on the concepts covered in ONCOL 333, with a shifting emphasis towards how radiation is produced, shaped, and measured in the clinical environment. Specific topics include x-ray tubes and flat-panel detectors, CT scanners, brachytherapy afterloaders, linear accelerators, multileaf collimators, and various measurement devices including ion chambers and diodes. Prerequisite: ONCOL 233 ONCOL 254 Clinical Oncology I *3 (fi 6)*(first term, 3-0-0) Basic concepts in clinical oncology including epidemiology, cancer screening, cancer staging and pathology, molecular diagnostics, all modalities of treating primary, metastatic and resistant cancers. Prerequisite: RADTH 205 Patient Care Principles and Practices ONCOL 255 Clinical Oncology II *3(*fi* 6) (Spring term, 30 hours/week for 3 weeks) Practical patient oriented aspects of cancer screening, assessment, and treatment delivery. Prerequisite: ONCOL 254 Clinical Oncology I ONCOL 310 Radiation Oncology II *3(*fi* 6) (second term, 3 –0–0) The study of the field of radiation oncology is further developed. The principles and practice of radiation oncology are extended to all potential tumour sites. By the

	completion of the course, students will have developed an understanding of the various treatment options for each of the tumour sites, and the respective treatment regimes, techniques, schedules, results, and toxicities of treatment with ionizing radiation. Prerequisite: ONCOL 210 Radiation Oncology I ONCOL 243 Radiation Protection and Safety *3(*fi 6)* (second term , 3-0-0) Introduction of the fundamental concepts in radiation protection and safety for the patient, self, and general public. Topics include: general principles and practices of working with radiation in a healthcare environment, differences in protection required for different types of radiation, basic radiation shielding considerations and facility design, monitoring and measurement of radiation for protection purposes, and relevant regulatory agencies and associated standards. Prerequisite: ONCOL 233 ONCOL 355 Treatment Planning & Dosimetry I *3(*fi* 6) (first term, 3–0 –0) Foundation of single and multi-field dose calculations for 3 dimensional treatment planning and the principles of radiation dose deposition within the patient will be applied in order to develop an appropriate treatment strategy for typical tumour locations. The course will focus on high energy X-ray beam dose calculations, however, electrons and other charged particles will be discussed. Prerequisite: ONCOL 233 Concepts and Applications in Medical Physics ONCOL 356 Treatment Planning and Dosimetry II *3(*fi* 6) (second term, 3 –0 –0) Concepts from ONCOL 355 are explored in more detail. Advanced topics in treatment planning will be covered, including 4 dimensional treatment planning, Intensity

	Modulated Radiation Therapy, Inverse planning, Arc therapy, and Brachytherapy planning. Prerequisite: ONCOL 355 Treatment Planning & Dosimetry I ONCOL 335 Radiobiology *3(*fi 6*) (first term, 3-0-0) An introduction to the physics, chemistry and biology of radiation effects on cells and tissues. Concepts discussed include the biological factors that influence the response of normal and neoplastic cells to radiation therapy; cell survival curves; linear energy transfer and relative biological effectiveness; effects on tissues of time, dose and fractionation of radiation treatment; and emerging concepts in radiobiology. Prerequisite: ONCOL 253 Cancer Biology ONCOL 254 Clinical Oncology I RADTH 205 Patient Care Principles and Practices *3(*fi 6*) (first term,3-0-0) Introduces the cancer disease trajectory and examines the principles of: palliative care psychosocial issues and factors affecting oncology patients; patient education; person-centered care; and toxicity assessment. Prerequisite: Permission of the Department RADTH 260 Radiation Therapy Clinical Practicum I *6(*fi 12*) (Spring, 30 hours/week for 5 weeks)) Provides an introduction to the patient experience through the radiation therapy planning and treatment trajectory. Enables and requires introductory participation in a variety of clinical environments. Prerequisites: ONCOL 243 Radiation Protection and Safety ONCOL 233 Concepts and Applications in Medical Physics ONCOL 234 Medical Physics Equipment

	and Instrumentation RADTH 205 Patient Care Principles and Practices RADTH 301 Principles and Practices in Radiation Therapy *3(*fi 6)* (first term,3-0-0) The principles and practices of radiation therapy will be examined with a focus on the patient and the practitioner as well as technological factors. Prerequisite RADTH 260 Radiation Therapy Clinical Practicum I RADTH 328 Health Care Advocacy and Policy *3(*fi* 6)(first term, 3-0-0) Examines the role policy plays in health care. It provides an overview of the professional, social, regulatory, national and global trends and issues affecting care delivery and cancer screening and prevention strategies. Codes of ethics, standards and scopes of practice, and national and provincial legislation will be considered. The concepts of informed consent, quality improvement, and best practice will be studied. Prerequisite: RADTH 260 Radiation Therapy Clinical Practicum I RADTH 360 Clinical Simulation 12(*fi* 24) (Spring, 30 hours/week for 13 weeks) This course facilitates: the integration and application of didactic knowledge within a simulated clinical setting; the transfer of skills/knowledge from site to site or procedure to procedure; confidence building in a safe practice environment; self evaluation; and the development of professional and ethical behaviours. Prerequisite: RAHTH 260 Radiation Therapy Clinical Practicum I ONCOL 306 Imaging Principles/Pathology ONCOL 356 Treatment Planning and Dosimetry II ONCOL 335 Radiobiology

	RADTH 401 Radiation Therapy Research Methodology *3(*fi 6)* (first term, 3 –0 –0) Examines a broad scope of research methods and components. Students will examine the action research process; research ethics; clinical trial methods and outcomes; and statistical methods in more depth. Development of a research project proposal and the ethics review process will be started. Prerequisites: ONCOL 335 Radiobiology RADTH 328 Health Care Advocacy and Policy RADTH 411 Radiation Therapy Research Project *3(*fi 6)* (second term, 1 –2 –0) Accessed in conjunction with Radiation Therapy Clinical Practicum III, students will prepare, conduct, and present a research project that demonstrates: evidence-based inquiry; reflection; critical thinking; analysis of data; synthesis of outcomes and personal practice; and development of a research report. Students will present to the radiation therapy community. Prerequisite: RADTH 401 Radiation Therapy Research Methodology RADTH 460 Radiation Therapy Clinical Practicum II *9(*fi* 18) (first term, 30 hours/week for 15 weeks) Involves the progression of application and integration of knowledge gained from all academic course and skills attained in the simulation environment to put into practice in the clinical environment. Skills learned will enable the student to perform safe and accurate treatments and patient interactions under the supervision of qualified healthcare professionals. Prerequisite: RADTH 360 Clinical Simulation RADTH 461 Radiation Therapy Clinical Practicum III

	*10(*fi* 20) (second term, 30 hours/week for 16 weeks) Involves the demonstration of critical thinking, clinical reasoning, effective problem-solving, and competent performance in all areas of entry-level radiation therapy practice. Successful completion of all components in mandatory for eligibility to access the CAMRT national certification examination. Prerequisite: RADTH 460 Radiation Therapy Clinical Practicum II

Appendix B: Program Layout for 2013 Cohort (Class of 2017)									
Pre Professional Year I 2013 -2014		**Year 2 2014-2015**			**Year 3 2015-2016**			**Year 4 2016-2017**	
Fall 15 credits	Winter 15 credits	Fall 15 credits	Winter 15 credits	Spring 9 credits	Fall 15 credits	Winter 15 credits	Spring/Summer 12 credits	Fall 12 credits	Winter 13 credits
ENGL 121,122, 123,124,125 or 126 **3(fi 6)* (either term, 3-0-0)	ANAT 200 *3(*fi 6)* (either term , 3-0-0)	ONCOL 243 Radiation Protection and Safety *3(*ft 6*) (first term,3-0-0)	ONCOL 253 Cancer Biology *3(*fi 6)* (second term, 3-0-0)	ONCOL 255 Clinical Oncology II *3(ft 6) (Spring term, 30 hours/week for 3 weeks)	Elective *3(*fi 6)* (second term , 3-0-0)	ONCOL 335 Radiobiology *3(*fi 6)* (first term , 3-0-0)	NEW RADTH 360 Clinical Simulation: 13 weeks *12(*fi 24)* (Spring , 30 hours/week for 13 weeks)	RADTH 401 Radiation Therapy Research Methodology *3(*fi 6)* (first term, 3 –0 –0)	NEW RADTH 411 Radiation Therapy Research Project *3(*fi 6)* (second term, 1 –3–0)
PHYS 124 *3(*fi 6)* (first term, 3-0-0)	PHYS 126 *3(*fi 6)* (second term , 3-0-0)	ONCOL 233 Concepts and Apps in Med Physics *3(*fi 6)* (first term, 3–0-0)	ONCOL 210 Radiation Oncology I *3(*fi 6)* (second term, 3-0-0)	_____ Spring term II RADTH 260 Radiation Therapy Clinical Practicum I *6(*fi 12)* (Spring , 30 hours/week for 5 weeks)	RADTH 301 Radiation Therapy Principles & Practices *3(*fi 6)* (first term,3-0-0)	ONCOL 310 Radiation Oncology II *3(*fi 6)* (second term, 3-0-0)		NEW RADTH 460 Radiation Therapy Clinical Practicum II (15 wks) *9(*fi 18)* (First , 30 hours/week for 15 weeks)	NEW RADTH 461 Radiation Therapy Clinical Practicum III (16 wks) *10(*fi 20)* (Second, 30 hours/week for 16 weeks
PSYCO 104, *3(*fi 6)* (first term, 3-0-1/4) OR SOC 100,101,102 *3(*fi 6)* (either term, (3-0-0)	PSYCO 105 *3(*fi 6)* (second term, 3-0-0) or SOC 100,101,102 *3(*fi 6)* (either term, (3-0-0)	CELL 201 Introduction to Molecular Cell Biology *3(*fi* 6) (first term 3-0-0)	ONCOL 234 Medical Physics Equipment and Instrumentation *3(*fi 6)* (second term , 3-0-0) DONE		ONCOL 355 Treatment Planning and Dosimetry I *3(*fi 6)* (first term , 3-0-0)	ONCOL 356 Treatment Dosimetry II *3(*fi 6)* (second term , 3-0-0)			
MATH 113 or 114 *3(*fi 6)* (either term, 3-0-1)	BIOL 107 *3(*fi 6)* (either term, 3-1s0-3)	RADTH 205 Patient Care Principles and Practices *3(*fi 6)* (first term,3-0-0)	ONCOL 254 Clinical Oncology I **3 (fi 6)* (second term, 3-x-x)		ANAT 305 Cross-Sectional Anatomy **3 (fi 6)* (first term, 3-0-2)	ONCOL 306 Imaging Principles/ Pathology **3 (fi 6)* (second term, 3-0-1)			
CHEM 101 *3(*fi 6)* (first term, 3-1s-3)	CHEM 261 *3(*fi 6)* (second term, 3-0-3)	PHYSL 210 Human Physiology *6(*fi 12)* (two term, 3-0-0)			RADTH 328 Health Care Policy *3(*fi* 6) (first term, 3-0-0)	INT D 410 Inter professional Practice **3 (fi 6)* (either term, 0-3S-0 10 weeks)			

Appendix C – Letters of Support

Department of Oncology, University of Calgary

Alberta College of Medical Diagnostic and Therapeutic Technologists to the Workforce Policy and Planning Branch, Alberta Health and Wellness

Alberta Health Services, Cancer Care

Canadian Association of Medical Radiation Technologists

The Michener Institute for Applied Health Sciences

Ap**pendix C – Letters of Support**
Department of Oncology, University of Calgary

Alberta Health Services

FACULTY OF MEDICINE | UNIVERSITY OF CALGARY

Department of Oncology
1331 29th Street NW
Calgary, AB T2N 4N2
Telephone: 403-521-3040
Fax: 403-521-2128

September 6, 2012

Dr. Carl Amrhein
Provost and Vice President (Academic)
University of Alberta
116 St. and 85 Ave.
Edmonton, AB T6G 2R3

Dear Provost,

RE: Proposal for a Bachelor's Program for Radiation Therapy at the University of Alberta

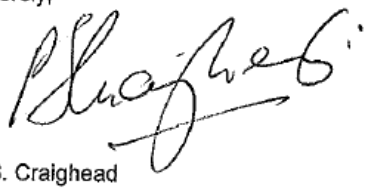
I am writing this letter in support for a proposal which has been shared with me by Dr. Sandy Mcewan, Department Chair of Oncology at the University of Alberta. I write this letter as the Chair of the Provincial Radiation Services Council of Cancer Care Alberta. Also, I am the Department Chair of Oncology at the University of Calgary, as well as the Medical Director of the Tom Baker Cancer Centre in the city. As such, I have a broad perspective on the importance of both research and education within professional disciplines, other than medicine.

To give you a context, my background discipline before entering administration was in radiation oncology and I was the Division Head of the Section of Radiation Oncologists in Calgary for ten years. During that tenure, I became very acutely aware early in 2000 that we were losing good, early graduates from our diploma program to other provinces and countries because we lacked a formal tertiary education route for accreditation of our radiation therapists. Together with Dr. Bob Pearcey, we were able to convince the Alberta Cancer Board to put forward a proposal for a degree program, which would be co-administered in both cities. This proposal received the support of the Cancer Board, both universities, as well as the Mt. Royal College, at that time, in Calgary.

Unfortunately, that application went to the Ministry of Labour and was quashed because it was felt to be consistent with 'degree-creep'. Alberta, at that point, was only one of two or three provinces not offering a degree program, but was not prepared to take the step of moving ahead with this important development. Over the last 5 years I have watched the development of a Provincial Radiation Therapy Training Program which has standardized the way we do therapy education and also watched with satisfaction the improvement of the general standards of education within that profession. In the hiring of Ms Susan Fawcett, we have been able to move ahead with a high standard diploma-based program and we are ready to move into what is a natural advancement to a degree program. I have seen the proposal, identified the strengths which I believe will make Alberta a unique place to undertake training in this discipline. I also note the requirements for investment both in Calgary and Edmonton to ensure that this program actually functions to supply well-educated, rounded individuals who are clinicians, as well as

capable academics. At the end of the day, I believe the strength of the proposal is that we will ensure that we are a place where individuals from across the country will want to apply for entry into such a program. There continues to be a need for constant number of therapists to be trained and an ever-increasing need for some of these individuals to be both researchers and educators so that their professional discipline is advanced, and our patients are treated maximally. As the proposal correctly states the discipline of radiation therapy is now matured into an area where we require focused sub-specialized individuals. This can only be achieved by significantly increasing the kinds of academic skills we invest in our students. As you can see, I have strong support for this proposal and will be watching peripherally to see how it advances through the various hoops. I am hoping that fairly soon we can announce that this will be available to prospective students wanting to enter in the profession of radiation therapy.

Yours sincerely,



Dr. Peter S. Craighead
Chair of Provincial Radiation Services Council, Cancer Care Alberta
Department Head Oncology, University of Calgary
and Clinical Zone Department Head
Medical Director, Tom Baker Cancer Centre

c.c. - Dr. S. Mcewan, Department Chair of Oncology
University of Alberta
- Dr. J. Meddings, Dean
Faculty of Medicine, University of Calgary

ACMDTT to the Workforce Policy and Planning Branch, Alberta Health and Wellness

July 16, 2010

Ms. Linda Mattern
Executive Director, Workforce Policy and Planning Branch
Alberta Health and Wellness
10th Floor, Telus Plaza North Tower
10025 Jasper Avenue
Edmonton, Alberta T5J 1S6

Dear Ms. Mattern

The Alberta College of Medical Diagnostic and Therapeutic Technologists (ACMDTT) is the regulatory body responsible to govern all practicing medical radiation technologists in a manner that protects and serves the public interest. ACMDTT provides direction to the practice of medical diagnostic and therapeutic technology and approves educational programs for the purposes of registration requirements. There has been significant change in the complexity of the medical radiation technology over the last 10 years driven by the complexity of changing technology and interventional advances in diagnostic and therapeutic practice.

Radiation therapists are key members of the oncology team that are responsible for the safe and effective planning and delivery of radiation treatment for Albertans. There are 181 Radiation Therapists regulated by ACMDTT and practicing within Alberta Health Services- Cancer Care.

In radiation therapy, there has been a dramatic shift in the environment driven by evidence-based advances in the field of radiation oncology. Evolving technology, collaborative interprofessional practice, and inclusion of research has impacted the role and scope of practice for radiation therapists in Alberta and nationwide. Changes to radiation therapy provincial and national competency profiles, as a result of advances in the radiation oncology discipline, require radiation therapists' to practice in a comprehensive and holistic manner. Increased requirements for proficiency in patient assessment, patient education, risk management, and research have become critical components of radiation therapy practice for a patient-centered care approach to the field of radiation oncology. In addition, critical thinking, evaluation, and synthesis skills in the technical practice of radiation therapy are imperative. Recognition of the unique skills and capabilities of these health care providers has led to increased involvement in patient-centered oncology care.

Although the practice model has evolved, the educational model has not. The 28 month in-house diploma program for radiation therapy is challenged to offer appropriate academic and clinical preparation for today's practice environment. Other provinces have met this challenge by

ACMDTT to the Workforce Policy and Planning Branch, Alberta Health and Wellness (con't)

moving to baccalaureate models of educational delivery as the standard for entry to practice education. This foundational education is also key preparation for the master's level recommended for "advanced" practice radiation therapy roles being implemented in the cancer care setting within Canada and in other countries around the world.

The ACMDTT is supportive of a strategy to affiliate the Alberta Radiation Therapy educational program with a post-secondary institution for degree credentialing in order to deliver the comprehensive academic and research preparation needed for today's environment. Transitioning from a diploma to bachelor degree for entry-level radiation therapist education will better prepare therapists to contribute at their maximum potential and will improve the provision of health care services delivery in the province of Alberta.

Sincerely,

Kathy Hilsenteger, MRT(T), ACT, CAE®
CEO/Registrar

David Buehler, MRT(T), CTIC
ACMDTT President

cc: John Thomson, Senior Manager, Education and Internally Workforce Education Health Professionals
Susan Fawcett, Professional Practice & Academic Leader, Alberta Health Services - Cancer Care
Dr. Tony Fields, Vice-President, Alberta Health Services - Cancer Care

Appendix C – Letters of Support
Alberta Health Services, Cancer Care

Alberta Health Services

May 25, 2012

Dr. Carl Amrhein
Provost and Vice- President, Academic
University of Alberta
2-10 University Hall
Edmonton, Alberta T6G 2J9

Re: Clinical Placements for Radiation Therapist Learners

Dear Dr. Amrhein:

Alberta Health Services-Cancer Care recognizes the importance of supporting clinical placement and experience for health professional learners. In addition to providing exposure to cancer care to many learners, within Radiation Services we provide focused support to Radiation Oncology Residents, Medical Physics residents and Radiation Therapy students. This is an important strategy in securing our long term health human resource needs and will continue to be a priority for us.

As we make this important transition in delivery of Radiation Therapist Education, I am happy to confirm Cancer Care's ongoing commitment to supporting clinical placement of RT students at appropriate cancer care sites.

Cancer Care is excited by the opportunity that this transition provides for enhancing interprofessional education and research across the three Radiation Sciences.

Sincerely,

Paul Grundy, MD FRCPC
Senior Medical Director and Acting Senior Vice President
Cancer Care

cc: Eileen Passmore

Alberta Health Services • Cancer Care
1500 – Sun Life Place, 10123 99th Street, Edmonton, Alberta, Canada T5J 3H1

Phone: 780 643-4387 Fax: 780 643-4397
www.albertahealthservices.ca

Appendix C – Letters of Support
Canadian Association of Medical Radiation Technologists

Canadian Association of Medical Radiation Technologists
Association canadienne des technologues en radiation médicale

September 11, 2012

Ms. Susan Fawcett MRT(T), B.Sc., M.A.
Provincial Radiation Therapist Professional Practice & Academic Leader
Administrator, Alberta School of Radiation Therapy
Alberta Health Services - Cancer Care
1220, 10405 Jasper Avenue
Edmonton, AB, T5J 3N4

Dear Susan,

The Canadian Association of Medical Radiation Technologists (CAMRT) commends the Alberta School of Radiation Therapy, the Government of Alberta Ministry of Enterprise and Advanced Education, and the University of Alberta on the establishment of a degree program for the practice of radiation therapy. As you are well aware, CAMRT has long been an advocate of a degree requirement for entry to practice for all medical radiation technology professions and we congratulate you on the implementation of a program that supports our members' vision. We are also encouraged to see that your group is now proposing that a graduate level program be established for the advanced practice of radiation therapy and would like at this time to express CAMRT's full support for this endeavour

As part of our 2012-2014 strategic plan, the CAMRT is committed to advancing the practice of medical radiation technologists in all four disciplines, which include radiation therapy. To date, we have made a significant investment in two large scale advanced practice initiatives. We are nearing the completion of an Advanced Practice Framework (Winter 2013) and are in the early stages of developing a national certification process for advanced practitioners in radiation therapy.

The Advanced Practice Framework will lay the foundation for advanced practice within the medical radiation technology professions. Within this document, we will identify the elements that characterize advanced practice in the context of the medical radiation technology professions, including educational preparation. The principles of critical thinking, problem solving, complex decision making and autonomy identified as core to the success of advanced practice roles, are closely aligned with the attributes of graduate level education.

10th Floor / 10e étage 85, rue Albert Street Ottawa, ON K1P 6A4
Tel / Tél. : (613) 234-0012 or / ou 1-800-463-9729 Fax / Téléc. : (613) 234-1097 www.camrt.ca

As an extension of the framework, we are developing a certification process for advanced practitioners within the radiation therapy community. The certification process will allow those who meet the requirements for advanced practice to obtain a professional credential recognized by the national association. We are currently working to align our nationally-validated competency profile with appropriate assessment methodologies for advanced roles. The committee investigating these potential methodologies strongly endorses graduate education as essential for entry into the Advanced Practice Radiation Therapist certification process.

The CAMRT believes that scopes of practice within the medical fields need to and can be optimized to improve patient care and maximize efficiencies within our healthcare systems. On behalf of our members, I reiterate our wholehearted support for the Alberta School of Radiation Therapy and the Government of Alberta's efforts to develop a graduate level program for radiation therapists. Please do not hesitate to contact us should you feel that we can be of further assistance in advancing this initiative.

Warmest Regards,

Amanda Bolderston

Amanda Bolderston, RTT, FCAMRT
President & Chair of the Board

AB/ms

Appendix C – Letters of Support
Michener Institute

THE Michener INSTITUTE For Applied Health Sciences

Radiation Oncology UNIVERSITY OF TORONTO

August 24, 2012

Susan Fawcett MRT(T), BSc, MA
Provincial RT Professional Practice & Academic Leader
Administrator Alberta School of Radiation Therapy
1220, 10405 Jasper Avenue, Standard Life Building
Edmonton, Alberta
T5J 3N4

Re: Radiation Therapy Education Program's Transition to a Baccalaureate Degree Program

The Medical Radiation Sciences Program, a joint degree/diploma program between The Michener Institute for Applied Health Sciences and the Department of Radiation Oncology, Faculty of Medicine, University of Toronto is in full support of the Alberta Radiation Therapy education program's transition to a baccalaureate degree program.

In response to professional standards requiring a baccalaureate degree as an entry requirement to practice, and in the interest of generating expanded career options for students, the Michener/University of Toronto MRS Program enrolled its first cohort of students in 1999. As a result, students have benefited tremendously from the breadth and depth of knowledge that both institutes of higher learning afford, developing students' analytical, critical and evaluative skills. Graduates are prepared to engage in professional practice at a high level of proficiency and contribute to the radiation therapy profession through evidence-based research. This is vitally important for the advancement of the profession.

As technology changes, and the way in which we deliver care to our patients changes, so too should the way in which we educate future healthcare providers. In July 2012, representatives from the Alberta Radiation Therapy education program met with the Radiation Therapy leads for the MRS Program at The Michener Institute, and had the opportunity to see first hand the advantage for the students of having access to a "light" linear accelerator. This enables the students to simulate treatment practices in safe, non-time pressured environment relieving some of that responsibility from our clinical partners and patients.

Medical Radiation Sciences Program
Room 148 · 150 College Street · Toronto, Ontario · M5S 3E2
Tel: 416.978.7837 · Toll-free: 1.800.387.9066
E-mail: radsciinfo@michener.ca

THE Michener INSTITUTE For Applied Health Sciences

Radiation Oncology UNIVERSITY OF TORONTO

Developing collegial relationships and collaborating with our colleagues in Alberta allows all parties to benefit from each others expertise and experience, to be able to deliver high class educational programs. The Medical Radiation Sciences Program endorses this proposal and is looking forward to collaborating further with the new degree program to contribute further to the profession of Radiation Therapy.

Yours sincerely,

Catherine Ladhani, MRT(R), BSc(Physiology), BAppSc(Medical Imaging), MBA-ITM
Chair, Radiation Therapy
The Michener Institute for Applied Health Sciences

CPalmer

Cathryne Palmer, MRT(T), MSc
Academic Coordinator, Medical Radiation Sciences Program
Assistant Professor, Department of Radiation Oncology, University of Toronto

Appendix D – Enrolment Projections

Proposed Enrolment	**2012-2013** Current 28 month Program	**2013-2014** Students enrol in undergrad program of choice	**2014-2015**	**2015-2016**	**2016-2017**	**2017-2018**
		Accreditation Visit				
Total Full-Time head count		Not known	15	35	55	60
• Full-Time Year 2	6	N/A	15	20	20	20
• Full-Time Year 3	0	N/A	N/A	15	20	20
• Full-Time Year 4	N/A	N/A	N/A	N/A	15	20
Anticipated Number of Graduates	0	0	0	0	15	20

Current Radiation Therapy Program 28 month cohort	**2010-2012**	**2011-2013**	**2012-2014**
• Full-Time	5	6	5

Appendix E– Final Staffing Compliment for 2017 (See Timeline for Phased in Hiring in Appendix I)

Title	Staffing	Position	Location	Major Accountabilities
Radiation Therapist	1 FTE	Program Director	Edmonton	Oversight of undergraduate and graduate program.
Radiation Therapist	4 FTE	Instructor	Edmonton	Curriculum development and treatment planning for Radiation Oncology, Applied Anatomy, Principles and practical applications of radiation therapy, Professional Practices and Patient Care/ Assessment
Radiation Therapist	1 FTE	Instructor	Calgary	Facilitate student research projects, research methods and applications, curriculum development and instruction.
Radiation Therapist	1 FTE	Instructor Clinical	Calgary	Clinical
Radiation Therapist	1 FTE	Instructor Clinical	Edmonton	Clinical
Radiation Therapist	1 FTE	Instructor Clinical simulation	Edmonton	Clinical simulation curriculum development and instruction. Radiation oncology instruction assistance. Assists in student research projects.
Radiation Therapist	2 FTE	Instructor Advanced Practice	Edmonton	Advanced Practice - M.Sc. program development. Contributes clinical and educational advice and resources to facilitate the integration of the educational and clinical environment. Assist in student research projects. Contributes clinical and educational advice and resources to facilitate the integration of the educational and clinical environment.
Radiation Therapist	.5FTE	Dosimetrist		Treatment Planning Applications
Medical Physicist	2 FTE	Faculty	Edmonton	Develops curriculum in dosimetry, medical physics and radiation protection/safety for radiation therapy. Teaches medical physics and radiation protection/safety. Assists in facilitating research for undergraduate and graduate students. Commissions and maintains devices for the planning and delivery of state-of-the-art radiation therapy treatments, monitors equipment performance, organizes quality control in imaging and therapy systems, designs radiation installations and controls radiation hazards as it pertains to both the clinical and educational environments. Maintains and supports the Treatment Planning Educational System. Contributes clinical, scientific and educational advice and resources to facilitate the integration of the education and clinical environments.
Radiation Biologist	2 FTE	Faculty	Edmonton	Develops cancer and radiation biology curriculum for undergraduate and graduate radiation therapy students as well as radiation oncology and medical physics residents. Teaches radiation biology courses at undergraduate and graduate levels. Assists in facilitating research. Teaches radiation biology courses to radiation therapists accessing bridging undergraduate education courses.

Title	Staffing	Position	Location	Major Accountabilities
Anatomist	1 FTE	Faculty	Edmonton	Develops curriculum and teaches whole-body anatomy for undergraduate radiation therapy students. Develops cross-sectional and imaging anatomy curriculum for undergraduate and graduate radiation therapy, medical physics and radiation oncology students. Teaches cross-sectional and imaging anatomy utilizing state of the art technological platforms.
Radiation Oncologist	1 FTE	Faculty	Edmonton	Curriculum development, consultation and assistance in facilitating research for undergraduate and graduate students.
Administrative Assistant	4 FTE		Edmonton	Co-ordination of academic scheduling. Support for instructors and faculty. Product ordering, interdepartmental bookings/scheduling. Communication with student cohorts regarding scheduling. Admissions assistance for students and program. Co-ordinator of accreditation response and administration/data entry to MedSIS/Moodle (student schedule support, instructor course material, metrics, evaluation data, etc.)
Teaching and Learning Specialist	1 FTE	Faculty	Edmonton	Assists with the development of learning events that incorporate the use of innovative pedagogy and instructional technologies for teaching.
Academic Technology Specialist	.5 FTE	Support	Edmonton	Provides support for the delivery of innovative programming, using medicated communication technologies. Assists with course production for the online environment, prepares course materials and provides training to faculty who will be teaching online.

Appendix F – Space Requirements

Space Type	Capacity	Area (sq. m.)	Location	Comments
General Office: Offices Workstations Admin workstns.	 6 6 3	117	University Terrace	6 offices for FTE; 6 workstations for clinical instructors & faculty with offices elsewhere. 3 workstations for admin staff.
Administrative Support: Meeting Copy, filing, etc.	 10	54	University Terrace	
Teaching/Learning: Computer lab PBL room VERT classroom	 25 6-8 30	285	University Terrace	Total area does not include shared classroom or OSCE space.
Clinical Teaching Simulation Space: CT Sim Linac Lite Support space		182	Cross Cancer Institute	
VERT laptop		0	Tom Baker Cancer Centre	No additional space required.
Total Space		**638**		

Appendix G– Simulation Technology –VERT System

www.vertual.co.uk

VERTUAL

Immersive VERT™

Immersive VERT™ systems provide you with a life size 3D visualization of a radiation therapy treatment room. Immersive VERT™ uses 3D rear projection so that trainees and tutors may walk freely around the virtual treatment room. These systems are ideal for classroom teaching as well as hands-on training for individuals and small groups.

Vertual provides a complete installation and support service, from the bespoke design of your Immersive VERT™ auditorium, installation of the VERT™ hardware, training, system maintenance and user support. Our ongoing development programme for VERT™ will keep VERT™ up to date with new RT developments and broaden its usefulness; thus adding value to your investment.

Immersive VERT™ with screen size of 4.8 x 2.1m

Immersive VERT™ with screen size of 3.2 x 2.4m

LINACS: VERT™ is available with fully articulated realistic virtual models of Varian, Elekta and Siemens linacs. Users control these virtual linacs via their respective real control pendants.

TRACKING: For the added sense of immersion in the virtual radiation therapy treatment room, VERT™'s tracking option allows a user to walk around the couch and patient which to them appears stationary. To achieve this, the position of the user's viewpoint is tracked. Tracking is beneficial for practising complex patient set-ups.

PROJECTORS: 3D projection in VERT™ is provided by industrial strength, robust, triple DLP® active projectors designed for continuous use. A range of projector configurations provides you with a screen size that will suit your needs and accommodation requirements. Typical configurations are:

	Projectors	Screen Size (m)	Screen Resolution	Lumens
SINGLE CHANNEL	1	3.2 x 2.4	1400 x 1050	6K
SINGLE HD	1	4.3 x 2.4	1920 x 1080	8K
DUAL CHANNEL	2	5.4 x 2.4	2400 x 1050	6K

Appendix G– Simulation Technology

VERTUAL

Immersive VERT System Installations: an Overview

The Immersive VERT system consists of the following main components:

- Large, back-projected screen.
- Cinema quality digital projector – in a projection room behind the screen.
- High performance computer (also in projection room).
- Optional: tracking system to track the position of the user – mounted to screen frame.
- In-room monitor (linac monitor) - mounted to the wall, near the screen.
- Control desk or lectern – located near the screen.
- Usually located on the lectern (or nearby) are the following:
    - Linac Hand Pendant(s).
    - Touch-screen monitor and PC (including keyboard and mouse).
    - Small AMX touch panel, used to control the projectors and other equipment.
- Audio amplifier (in projection room) and speakers (in auditorium).

Most of the installation work is carried out by an experienced engineer from our hardware partner, Virtalis Ltd. However, some preparation is needed on site prior to installation, as described in the "Room Preparation Guide", and summarised briefly here:

- Construction of a partition wall with an aperture for the screen. This usually includes a door, to provide access to the projection room.
- Installation of trunking, so that cables can be run from the projector room to the auditorium.
- Providing suitable power and network sockets.
- Lighting, cooling and ventilation.
- Providing a suitable desk, table or lectern for the presenter to use.

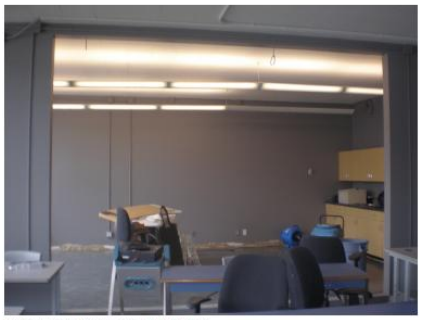
Here is an example of a typical Immersive VERT system, immediately after installation:

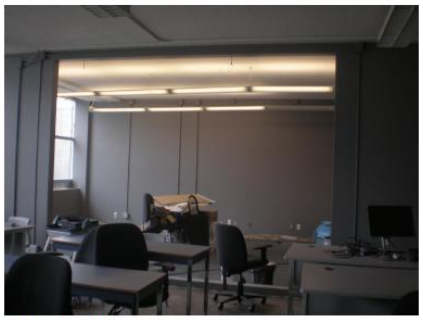
Typical example of an Immersive VERT system

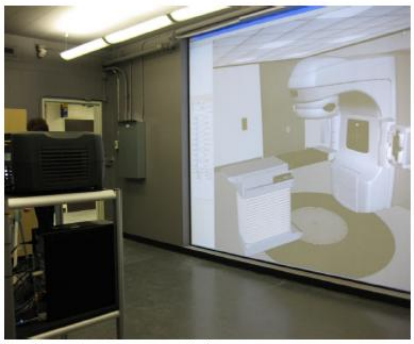
In this example the control desk is just out of the bottom right hand side of the photograph.

Appendix G– Simulation Technology Installation Example

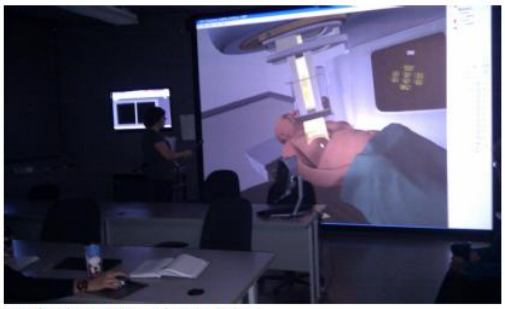
British Columbia Institute of Technology, Vancouver, Canada
Installed March 2011
Mirage S+6k projector, touchscreen display, in room monitor


Screen aperture prepared by builders


Another image of screen aperture

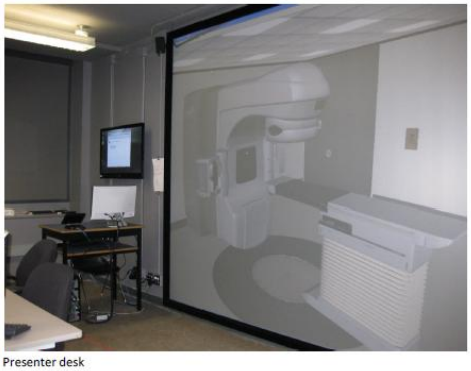

View from projection room towards the screen


Projector, projector table, VERT PC and control panels


Completed system in use during training


AMX control panel and touchscreen display.


Overview of VERT system showing presenter station and in room monitor

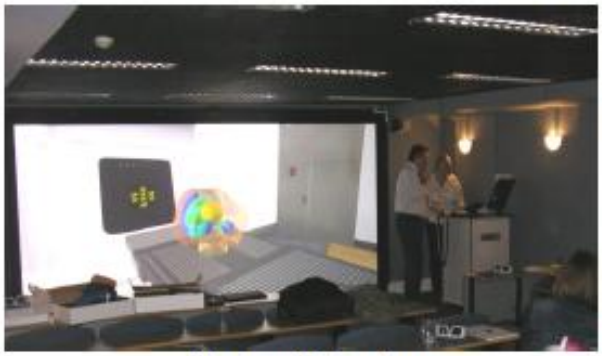

Presenter desk

Appendix G– Simulation Technology Installation Examples

Other VERT installations at a glance

Sheffield Hallam University

London City University



Kingston University

Appendix H: Radiographic Full Body Phantoms

X-ray Phantom_5

CT Whole Body Phantom **PBU-60**

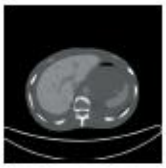
Product No. PH-2B

Available in Summer 2009 *Specifications are subject to change.

A unique, life size whole body phantom for CT provides a variety of educational application as well as visual evaluation in finding out optimal scanning conditions. The phantom can also be used for plain X-ray, showing life-like images. No metal parts or liquid structure are used.

Whole Body CT

PLAIN X-RAY



KYOTO KAGAKU

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USA Office: 3109 Lomita Boulevard, Torrance, CA 90505-5108, USA Tel: 1-310-325-8860 Fax: 1-310-325-8867

Organs are anatomically correct and have appropriate HU numbers.

Internal Organs
Head

Synthetic skull
Cervical vertebrae
Brain
- Cerebrum
- Mesencephalon
- Cerebellum
- Cerebral ventricles

Eyeballs
Arteries with contrast medium (left half only)

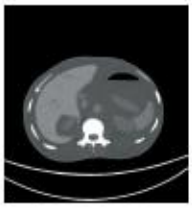
CT images

X-ray images

3D reconstruction of CT data

Internal Organs
Trunk

Vertebrae
Clavicles
Ribs
Sternum
Scapula
Coxal bones
Femurs
Lungs with pulmonary vessels (up to third bifurcations)
Trachea (up to fourth bifurcations)
Liver with portal and hepatic veins
Kidneys
Gallbladder
Spleen
Aorta
Cava
Ureter
Urinary bladder
Prostate
Rectum
Sigmoid Colon



Materials and features:

Soft tissue and organs:
Urethane base resin (SZ-50)

Synthetic bones:
Epoxy base resin

Joint attachments:
Epoxy, urethane with carbon fiber

Screws: Poly carbonate

Soft tissue (SZ-50) material

Material	Density g/cm3	Effective Atomic Number	Electron Density x10-23e/g	Elemental Composition (wt%)			
				H	C	N	O
Water	1.000	7.417	3.343	11.19			88.81
SZ-50	1.061	6.14	3.258	8.41	72.25	4.61	14.73

	Soft tissue	Liver	Kidneys
Hounsfield number (Approximation)	-7	70	30
Density g/cm3	1.061	1.089	1.075

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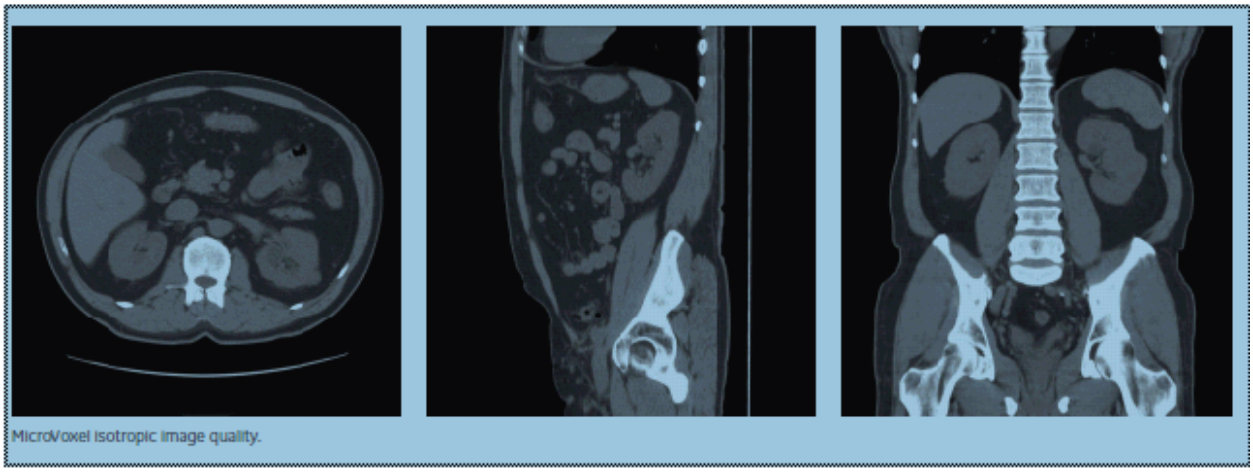
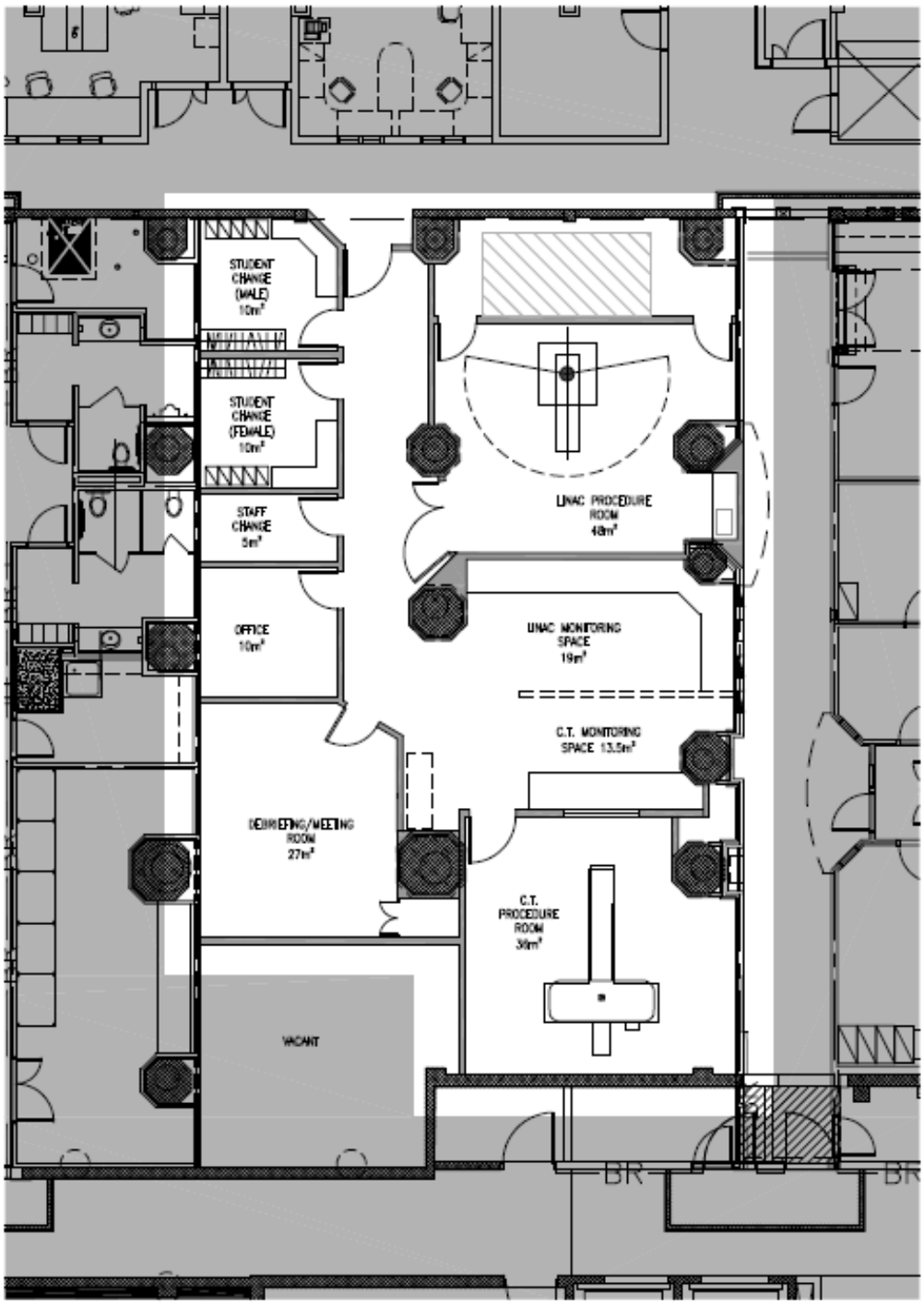
USA Office: 3109 Lomita Boulevard, Torrance, CA 90505-5108, USA Tel: 1-310-325-8860 Fax: 1-310-325-8867

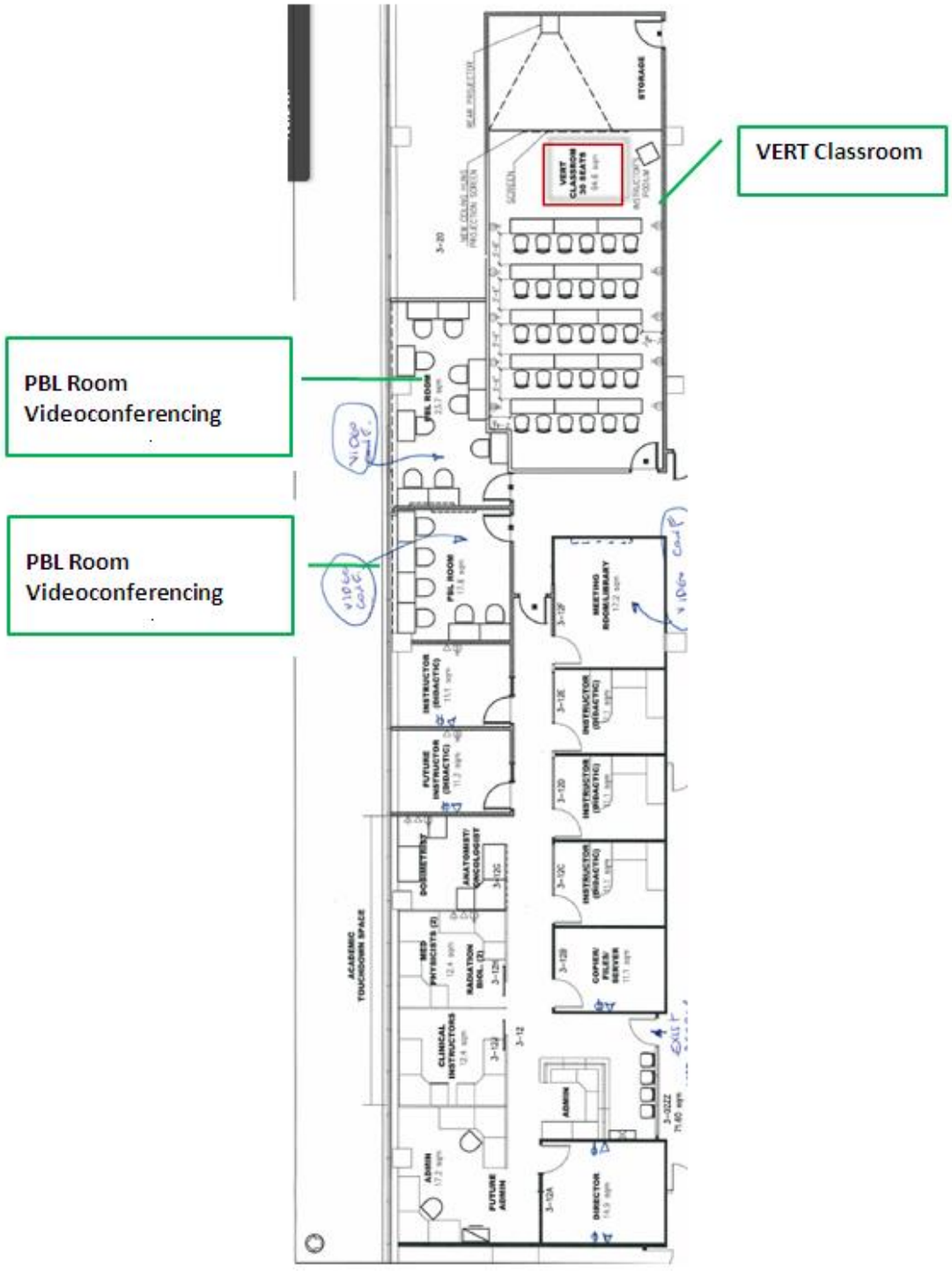
Appendix I: Example of a CT scanner



Appendix J: Installation of Linac and CT scanner at Cross Cancer Institute

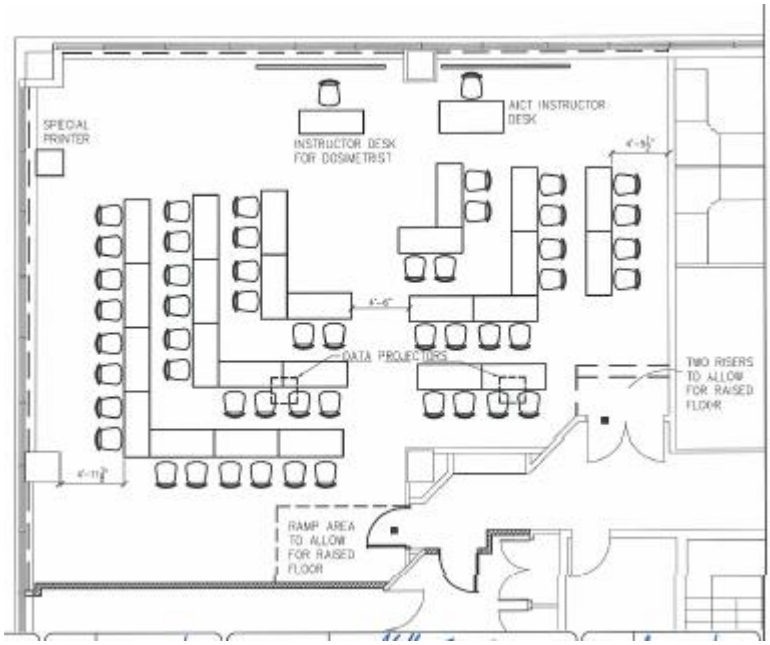


Appendix J: Installation VERT Classroom in University Terrace

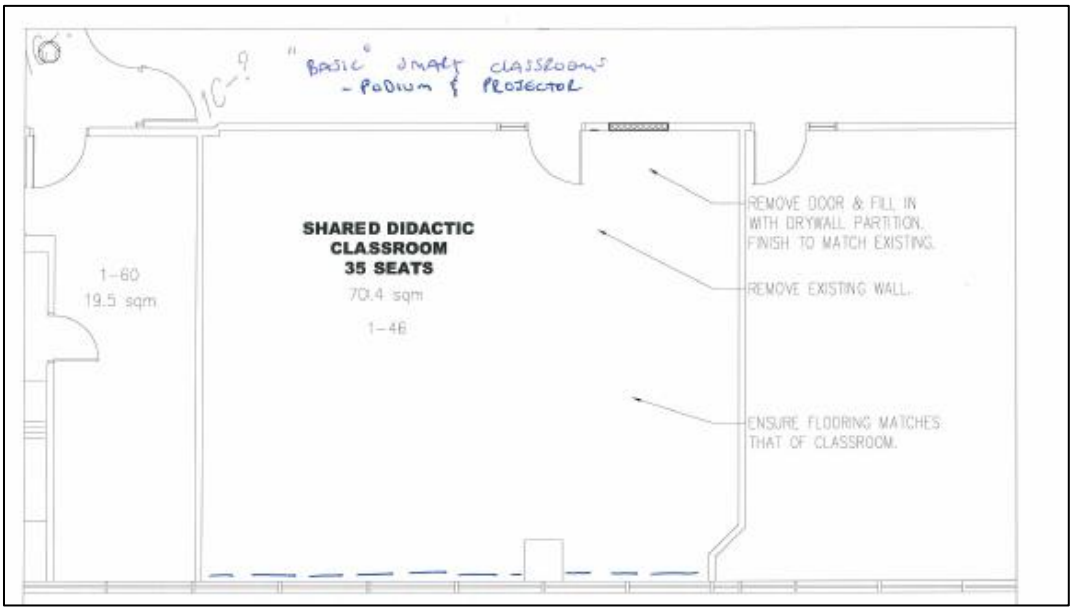


Appendix J: Classroom Space in University Terrace

Computer Lab



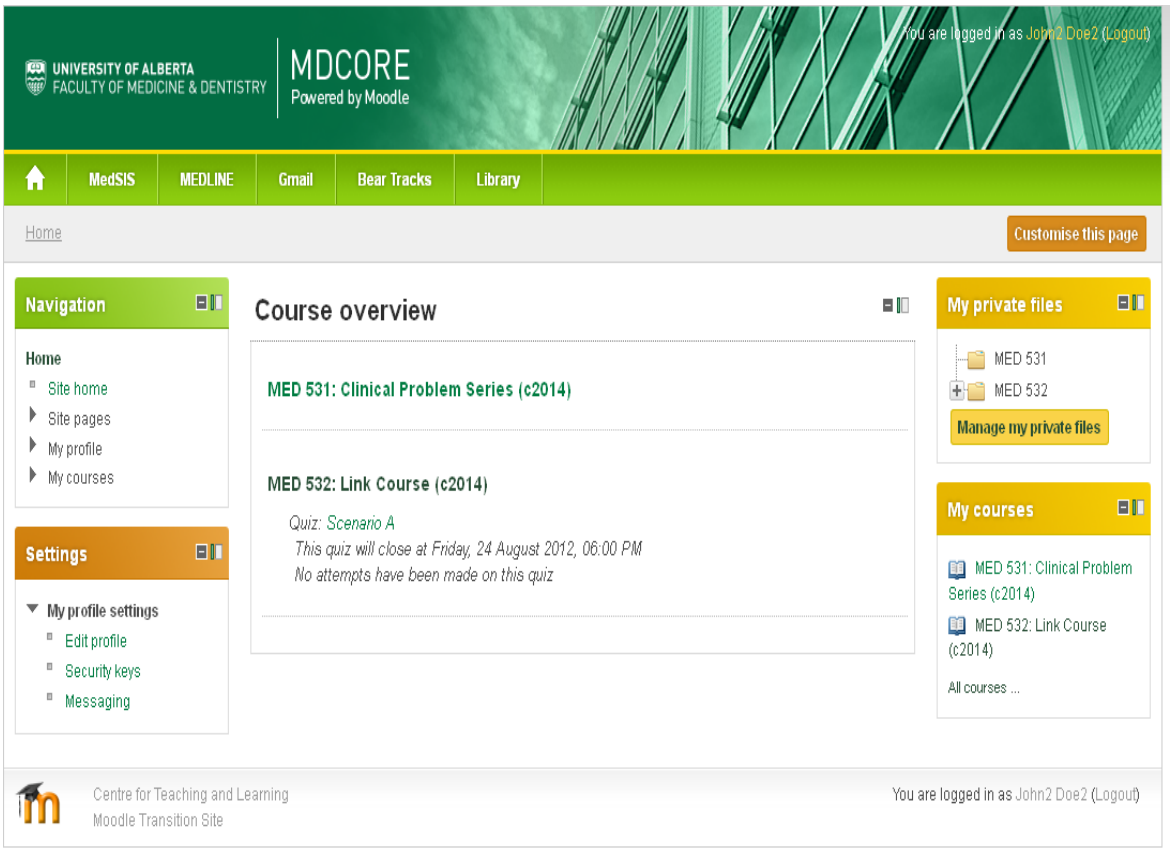
Classroom



Appendix K: Student Information and e-Learning Systems

MedSIS and Moodle

MedSIS



Moodle

Appendix L: RADTH Program Budget Overview

This budget request has been developed to allow the creation of a nationally and internationally competitive academic program leading to the award of a Bachelor of Science degree in Radiation Therapy. It has also been developed to facilitate the early introduction of a postgraduate program leading to advanced practice certification soon after the baccalaureate program becomes operational. The budget was built in 3 distinct phases. The first phase was the preliminary budget that was put together to support the initial letter of intent submitted by the University of Alberta in spring 2012; this preliminary budget was based upon the broad elements of the program identified in preparatory work performed over the previous 2 to 3 years. The second phase was the refinement of this budget as details of the program were put together for submission to the University, with the recognition of the importance of including all cost elements associated with the degree, including postgraduate teaching and advanced practice certification. There are major similarities between these first two elements.

The final phase of the budget was developed after a site visit to the Michener Institute in Toronto, where it became clear that a world-class program required investment in infrastructure to allow students to develop clinical skills and confidence in a clinical training environment that did not impact daily hospital clinical activities. From the site visit it became clear that this environment is best accomplished through the acquisition and installation a training linear accelerator "lite" and a training CT simulator. These two units will be used to teach essential practical clinical skills prior to the students entering an increasingly complex and busy clinical environment. The advantages identified by the faculty at the Michener Institute included clinical confidence, competence around the linear accelerator and, most importantly, a significant reduction in the amount of clinical care time lost in the hospital as students already had core clinical competencies related to the clinical operational environment. In the Alberta healthcare system, where clinical care on the linear accelerators is already at maximum capacity, we believe this new clinical training capacity will become a critical enabler for the expansion of student numbers and the quality of instruction provided to those students. It is anticipated that this teaching facility will be housed in the basement of the Cross Cancer Institute.

Budget Summary Request	**2013/2014**
Phase I - Original Submission Estimates	$ 3,690,697
Phase II - Supplementary Request	
Cross Cancer Institute	$ 4,509,640
Additional One-Time Startup and Ongoing Program Operations	$ 2,509,870
Total Funding Requested	**$10,710,207**

As proposed, the budget has four elements:

1. One Time Start Up Costs:
    a. Facilities renovations/development of program space
    b. Security upgrades, furniture/signs/telecom/moves
    c. Academic technologies, AV and IT
    d. Program expansion in the clinical sites
    e. Specialized major equipment
2. Teaching Facility Enhancements at the Cross Cancer Institute
3. Program Development Costs:
    a. Curriculum development
    b. Project management
    c. Faculty recruitment costs
4. Ongoing Program Costs:
    a. Personnel (and recruitment) costs for managing and teaching the program
    b. Program costs
    c. Other direct costs

Overall Budget	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
One Time Costs	$2,882,597				
CCI Teaching Facility Equipment	$2,897,500				
CCI Teaching Facility Renovations	$1,612,140				
Program Development Costs	$ 858,100				
Ongoing – Personnel Costs	$2,238,470	$2,714,513	$3,323,348	$3,843,634	$4,035,811
Ongoing – Program Operation Costs	$ 221,400	$ 237,900	$ 280,234	$ 301,469	$ 307,402
TOTAL REQUESTED	**$10,710,207**	**$2,952,413**	**$3,603,582**	**$4,145,103**	**$4,343,213**

1. One Time Start Up Costs:

There are a number of one-time start-up costs associated with the establishment of the new Radiation Therapy Degree Program. Below is a summary of these costs followed by a detailed budget justification.

	2013/14
One Time Start Up Costs	
CCI Teaching Facility – Equipment and Renovations	$4,509,640
Terrace Building – Equipment and Renovations	$2,798,717
Tom Baker Calgary - Equipment	$ 83,880
Program Development Costs	$ 858,100
TOTALS	**$8,250,337**

a. Facilities Renovations/Development of Program Space

Renovations and Development of Program Space	**University Terrace**	**Tom Baker Calgary**	**Totals**
Facility Renovations	$ 939,831		$ 939,831
Security Upgrades	$ 20,000		$ 20,000
Furniture/Signs/Telecom/Moves	$ 207,460		$ 207,460
Academic Technologies: AV Equipment	$ 457,000		$ 457,000
Academic Technologies: IT Equipment & Upgrades	$ 868,650		$ 868,650
Specialized Major Equipment	$ 305,776	$ 83,880	$ 389,656
Miscellaneous minor equipment			
TOTALS by Building	**$2,798,717**	**$ 83,880**	**$2,882,597**

The program will be based on the third floor of University Terrace, where program offices will be housed, and where most didactic teaching will occur. Clinical teaching will continue at the Cross Cancer Institute and at the Tom Baker Cancer Centre, although in the future radiation therapy sites in Lethbridge and Red Deer may also be used. Renovations to University Terrace will create a multidisciplinary teaching environment that will allow program expansion should this be required in the future, and which will also allow access to innovative cross-sectional anatomy teaching to other University programs.

It has been the goal of the university planning process to identify space that will enable the RT degree program to exist as a discrete entity. The Office of the University Architect has identified appropriate space within the University Terrace building to accommodate these needs, recognising that renovations will be required to accommodate the specific requirements of the program.

i. A multipurpose classroom will be developed to accommodate a VERT teaching simulator for preclinical training in clinical equipment use, as well as general teaching space for up to 30 students. It is anticipated that much of the didactic teaching for the students that is specific to the RT degree will occur in this multipurpose classroom.

ii. A computer laboratory will be built to accommodate up to 50 students sitting at 25 computer monitors. For the RT degree this laboratory will be used for teaching in cross-sectional anatomy and cross-sectional imaging. It will also be heavily used for radiation treatment planning simulation classes. In addition to this primary role in the new degree, it is anticipated that this classroom will become a major resource for the Faculty of Medicine and Dentistry and that, in addition to RT students, it will be accessed by radiology and radiation oncology residents, and other elective trainees.

iii. Two small classrooms will be required to accommodate problem based learning. These classrooms will require access to the computer network, and will accommodate up to 8 students at one time.

iv. General office space, including academic offices for full-time and part-time faculty, and associated administrative support spaces will be required by the program, and can be accommodated within the University Terrace space.

v. A final component of teaching space that will be required is access to an area in which Objective Structured Clinical Examination (OSCE) can be conducted. The final location of the space has not yet been finalised, but it is anticipated that this will be in the Zeidler facility.

b. Security Upgrades, Furniture/Signs/Telecom/Moves: $207,460 and $20,000 (Detailed in following pages)

Office furnishings including desks, hutches, computer stands and filing cabinets will be required for the Edmonton academic and support staff administrative space. As well, computers, printers, audio visual equipment, fax machines and photocopiers will be required for the program in both the administrative and teaching spaces. These are identified in the budget costing details. Given the complexity and cost of the installed equipment, and the clinical nature of the teaching environment security card access will be provided at University Terrace – the cost for this will be $20,000.

c. Academic Technologies, AV and IT: $457,000

.

Academic Technologies, AV and IT Budget		
Rooms	**Cost**	**Comments**
PBL rooms 19.5 SQM	$40,000	Flat screen, VC system, rack, control system, alarm, installation and support
PBL rooms 23.4 SQM	$40,000	Flat screen, VC system, rack, control system, alarm, installation and support
Meeting room/Library	$42,000	Projector, screen VC system, rack, control system, alarm, installation and support
Vert Classroom	$60,000	Projector, screen, podium, smart podium screen, rack, control systems, alarm, installation and support *system separate from 3D
Computer Lab	$190,000	2 Dicom grade projectors, 2 screens, 2 instructor podiums, VC system control system, alarm, installation and support
Room 1-46	$15,000	Projector, screen, patch panel, installation and support
Anatomy rooms MSB	$70,000	12-46" medical grade displays with mounts, installation and support
TOTALS	**$457,000**	

Academic Information Communication Technologies (AICT) at the University of Alberta has developed standards for Smart classrooms, electronically enhanced classrooms and small group teaching rooms that create new opportunities in teaching and learning by integrating computer, multimedia, and network technology. The addition of internet capability, projectors and screens will provide a rich problem-based learning environment, access to electronic educational resources and the opportunity for an enhanced innovative teaching environment. These technologies will also facilitate the teaching and coaching required for students placed on clinical assignments in the Calgary area. The proposed new RT program will utilize electronically enhanced teaching and learning facilities and includes equipment for the following: upgrades to an existing didactic classroom, new computer lab, the VERT classroom, one conference room, two problem based learning (PBL) rooms and equipment upgrades to the Anatomy teaching lab.

A major innovation in this program is the creation of a computer laboratory to provide an environment in which both didactic teaching and self-directed learning can occur. The primary goal of this innovative environment is to enhance program capacity in teaching radiation therapy treatment planning, and also to facilitate the teaching of cross-sectional anatomy, and essential skill required to develop treatment plans. Treatment planning involves the 3-D simulation of the radiation therapy fields that will be delivered to the patient, to ensure that maximum radiation doses are applied to the tumour whilst sparing surrounding normal tissues as much as possible. As such, in addition to the space and computing infrastructure, a

teaching PACS system will be installed, together with the required training software, to support the didactic and self-directed learning elements of the program. A description of the space is described in ii above.

In addition to the creation of the laboratory we have undertaken a clinical IT infrastructure assessment to ensure robust learner access to the current Alberta Health Services clinical radio therapy clinical treatment planning system (TPS). Access to this system will be required to support the teaching program.

d. Program Expansion in the Clinical Sites - No additional costs

Clinical teaching will continue to take place at the Cross Cancer Institute in Edmonton and the Tom Baker Cancer Centre in Calgary. No additional space will be required at either site, and there will be no need for renovations to support the additional students. Additional costs associated with clinical instructors and teaching equipment are discussed in the appropriate sections. In time it is anticipated that clinical training will be expanded to occur in the new radiation oncology services being established in Lethbridge, Red Deer and Grande Prairie. No costs or timelines for this possible expansion have yet been identified.

e. Specialized and Major Equipment : $305,776 and $83,880

Before entering the clinical environment students will be exposed to the techniques, skills and background knowledge that will be needed in day-to-day practice. To ensure that this exposure is as clinically relevant as possible we propose to include four major items.

i. VERT Simulator. This is a virtual simulator of a linear accelerator, the clinical unit with which patients are treated. The simulator will be based in University Terrace, and it has become, internationally, the accepted standard for teaching of radiation therapists. It provides simulation of the equipment from the two major linear accelerator vendors, and is physically identical to the units in clinical service, with exception that it cannot deliver therapeutic doses of radiation. This simulation system enables the student to become familiar with linear accelerator controls, patient positioning, 3 dimensional representations of treatment plans and risks associated with operating linear accelerators in the clinical environment.

ii. Laptop VERT Simulator. This is a “desktop” teaching version of the full 3-D simulator that will be provided to the Calgary training environment to facilitate the transition to clinical teaching at the Tom Baker Cancer Centre. It will serve to reinforce the lessons learned on the simulator in Edmonton, and to address issues of translating care into the clinical environment. It can be operated in a standard classroom, and does not require the complexities of installation that are required for the full-scale simulator to be placed at the University of Alberta.

iii. Each clinical site will require an anthropomorphic whole-body phantom that will be an important element of student teaching providing hands-on experience in patient positioning and orientation, anatomic relationships and treatment set up using the linear accelerator and CT simulator. It provides an early introduction to clinical concepts and ensures that students entering the clinical environment have the confidence, the necessary clinical skills and an understanding of anatomical relationships to enable rapid integration into the clinic.

2. Teaching Facility Enhancements at the Cross Cancer Institute

Cross Cancer Institute (Linac & CT simulator teaching equipment not originally budgeted)	**Estimated Costs**
Facility Renovations	$ 1,547,500
Security Upgrades	N/A
Furniture/Signs/Telecom/Moves	$ 24,640
AV Equipment	$ 40,000
IT Equipment & Upgrades	N/A
Linac Lite	$ 2,000,000
CT Simulator	$897,500
Total	**$4,509,640**

As discussed above, it has become clear from the experience of the Michener program that the quality of teaching – and of the graduates has been significantly enhanced by the acquisition of the two "hands on" teaching aids – the Linac Lite and the CT simulator. In the context of the University of Alberta program early acquisition of these components of the teaching program will enable best teaching practices to be integrated into the earliest components of year three.

The Linac Lite is used to prepare students for actual operation of a linear accelerator in the clinical environment; it is a fully functioning linear accelerator from which the radiation delivery module has been removed. It provides students with the opportunity to learn how to operate the machine, perform quality assurance and how to deal with patient interactions in a simulated, and clinically relevant, setting prior to entering the true clinical environment. The guidance that we have from Michener is that these two teaching units have proved invaluable in preparing students for the clinical environment, for ensuring that their skills in interacting with patients are as well-developed as possible and in reducing risk.

The CT simulator provides the same opportunities, and in particular, has an important added value in teaching students the operating parameters of a CT scanner in a treatment planning environment, and enables them to understand the limitations of the technology; this is particularly important in teaching how best to develop a three-dimensional treatment plan.

An added benefit at the CCI of both of these units is that a great deal of teaching can be done on the two teaching aids, sparing the clinical linear accelerators the complexities of having to deal with increased student numbers in a very, very busy clinical setting. Our clinical colleagues advise that this would be a significant advantage to the clinical training part of the program. Costs identified with the two units are the costs of each individual machine, plus costs associated with facility renovation and installation.

We anticipate that the two systems can be installed in vacant space in the basement of the CCI, taking advantage of a current renovation project that is presently in the planning stage. The design parameters and cost estimates of the renovation are included in this document; costs have been estimated by HFKS, the architects associated with the CCI redevelopment.

We recognize the significant cost implications of this initiative. Failing to acquire these two units would not mean the program cannot proceed; it will, however, have difficulty in building a degree that is nationally and internationally competitive, and it will create lost opportunities for excellence in clinical teaching. In addition, the clinical environments will be significantly impacted given the substantial hands-on practical experiential learning that expanded numbers of students require on these two pieces of equipment.

3. Program Development Costs

Program Development:	
Curriculum Development	$ 50,000
Project Manager	$ 133,100
Faculty Recruitment	$ 675,000
Total Program Development Costs	**$ 858,100**

a. Curriculum Development: $ 50,000

There will be costs associated with the development of a new curriculum moving from the current two-year diploma program to the degree program. This will also include marketing and advertising of the new program, and building capacity curriculum expansion.

b. Project Manager : $ 133,100

A Project Manager will work with the Steering Committee and will be responsible for the coordination and facilitation of all developmental aspects of the RADTH program. This position will be required immediately and will continue for approximately one year.

c. Faculty Recruitment Costs - $ 675,000

Within the request for program approval we have identified new Faculty members who will need to be recruited to ensure the rigour of the program offered by the University, and to ensure that an appropriate mix of expertise is available to develop the many new courses that will be included in the new curriculum. We are identifying here the onetime costs associated with these recruitments, in particular those of the cancer biologists and the medical physicists. These faculty members will have typical university teaching appointments with a 40:40:20 job descriptions, and will also have an expectation of building a research presence in the Department, and supporting the research rotations of the students As the advanced practice and graduate degree programs develop, these individuals will provide vital expertise and academic capacity to enable the University to make these programs a reality in the time frames identified in the plan. In order for us to attract highly qualified faculty, and to be competitive in the current market, we will need to provide establishment grants for these scientists. We believe that these grants would need to be $100K for each physicist and $200K for each biologist. There will also be advertising, search and selection and relocation costs associated with the recruitment of these new faculty members.

4. Ongoing Program Costs

Revenue	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Tuition and Related Fees		45,225	105,525	165,825	180,900
Other Internal Sources					
External (Third Party) Sources					
Government of Alberta Sources - to be determined					
Total Revenue		45,225	105,25	165,825	180,900
Expenses	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Salaries, Wages & Benefits: Program Director, 11.5 FTE Radiation Therapists overtime; Radiation Oncologist; 2.0 FTE Medical Physicist; Radiobiologist; Cancer Biologist, Anatomist, Teaching & Learning Specialist; .5 FTE Academic Technology Specialist; 4 FTE Program Administrative Staff over time.	2,238,470	2,714,513	3,323,348	3,843,634	4,035,811
Learner Advocacy and Wellness (LAW)		15,000	33,334	46,669	50,002
Program Materials & Supplies	50,000	51,500	63,500	65,400	67,000
Library Services	20,000	20,000	30,000	30,000	30,000
Software Upgrades	115,000	115,000	115,000	115,000	115,000
eLearning Supplies and Sundries	23,400	15,400	13,400	13,400	13,400
Other Direct Costs - travel	13,000	18,000	18,000	20,000	20,000
MEDSYS and Moodle		3,000	7,000	11,000	12,000
OSCE	TBA	TBA	TBA	TBA	TBA
Total Operational Costs	2,459,870	2,952,413	3,603,582	4,145,103	4,343,213

a. Personnel (and recruitment) costs for managing and teaching the program

In order to develop the program that is nationally and internationally recognized we have identified the following positions required for faculty and support staff. To meet program deadlines recruitment for key positions need to be started in academic winter term 2013.

Faculty

i. Program Director: The program director (PD) will monitor the components of the integrated provincial program structure to ensure support and direction for program staff and faculty. The PD will oversee the recruitment process for academic and clinical instructors as well as administrative staff. The PD will be responsible for operations of both the clinical and didactic components of the RADTH, and will work collaboratively with the clinical RT departments to support the clinical sites. The PD will monitor the overall program, including review of clinical, student, instructor/faculty and preceptor metrics. The PD will ensure that the academic program is reflective of current clinical practice.

ii. Radiation Therapists: Projected enrolment for the RADTH will increase from initial levels of 15 students per year to a maximum of 20 students per year, necessitating an increase of the current faculty complement of 5.5 FTE to, eventually, 11.5 FTE. Increased teaching demand, expanded program length, curriculum expansion and integrating clinical simulation teaching methodologies require these additional therapist faculties. In addition, support for existing faculty who are completing advanced credentialing to meet university-level qualification is required.

iii. Radiation Oncologist: A 1.0 FTE radiation oncologist will be an advisor to the curriculum development committee. This academic clinician educator will share didactic and clinical teaching responsibilities for the principles and practice of radiation oncology, general interdisciplinary oncology and cancer radiotherapy treatment planning. Although all members of the Division of Radiation Oncology hold Special Continuing Appointments with the FoMD, there are currently no University-funded radiation oncologists in the Department of Oncology.

iv. Medical Physicists: 2.0 FTE medical physicist faculty (rank-based salary plus market supplement): advisory to the curriculum development committee. These academic medical physicists will share didactic responsibilities for a variety of new courses for the new program – medical physics, equipment and instrumentation, radiation protection and safety, and radiation treatment planning and dosimetry. They will also be responsible for practicum and clinical training in the physics of radiation therapy.

v. Radiobiologist: A 1.0 FTE radiobiologist (rank-based salary plus market supplement) will be advisory to the curriculum development committee and will have a background in molecular or cellular radiobiology, radiobiological modeling and/or biophysics. He/she will share didactic teaching responsibilities for radiation therapy undergraduates and will be responsible for the development and teaching of courses, which will include introductory radiobiology and advanced radiobiology and will also be involved in the creation of the Master's degree program. These courses will also be available to radiation oncology and medical physics residents and to undergraduates across campus. A potential candidate for this position has been identified.

vi. Cancer Biologist: A 1.0FTE cancer biologist (rank-based salary plus market supplement): the advisory to the curriculum committee, this faculty member will advise on the development of core cancer biology teaching to the student cohort. This will initially involve the development of one new course, which could well be offered to the wider University community, and also to help develop and research methodology teaching and help with research projects in year four of the program. Once the baccalaureate program is up and running, it is anticipated that this faculty member will be involved in the Department to further courses, related to the MSc advanced practice program as it is developed.

vii. Anatomist: Anatomist faculty: (rank-based salary plus market supplement): advisory to the curriculum development committee, this faculty member will advise on the development of two anatomy courses that will be directed at the radiation therapy students. One of these will involve the teaching of gross anatomy, and the other cross-sectional anatomy, to provide the students with the necessary background to be able to understand distribution of dose within the body, and organ relationships with respect to that dose distribution. In addition, the anatomist will assist clinical faculty in the principles of imaging course through reinforcement of cross-sectional anatomy principles.

viii. Teaching and Learning Specialist: The teaching and learning specialist (APO) will work with faculty in the design and development of curriculum for the undergraduate, Phase II e-Learning Bridging and Master's programs. He/she will be skilled in the use of innovative pedagogy and instructional technologies for teaching, and in assessment and evaluation methodologies, data collection and needs assessment data gathering.

Support Staff:

i. Academic Technology Specialist: The academic technology specialist (.5 FTE) will work with the faculty web programming specialists, project managers and related staff in the preparation of the courses in RADTH. He/she will assist in the development of courses for e-Learning delivery.

ii. Administrative Support: There will be a need for three FTE positions at the start of the RADTH; this will be increased to four FTEs, based on program expansion in 2015. There will be a significant increase in administrative support required for the new degree program, the bridging program for existing practitioners and recent graduates, and the planning of the Master's program. Student numbers will rise, the program length will increase and the complexity of clinical placements will increase. There will be a large role for administrative support as the new program prepares for the Canadian Medical Association Accreditation that will span a number of years for full accreditation. Administrative support will be vital for the set up and maintenance of the MedSys learning management system, which will provide student schedule support, instructor course material, metrics, evaluation data, etc. There will also be the need for administrative support for recruitment of staff, payroll and operational and financial management of the program funding.

b. Program Costs:

i. Learner Support: The Office of Learner Advocacy & Wellness (LAW) ensures learners in the Faculty of Medicine & Dentistry at the University of Alberta have a voice in issues that affect their professional and academic lives. The office also promotes balance, resilience, and the provision of adequate supports and accommodation when barriers to achievement arise. LAW provides services on a confidential basis, so the office is a safe place for learners to go to when they have academic or personal issues. Included in the annual fees associated with providing this service are additional fees to support aboriginal learners in the program.

ii. Program Materials and Supplies: Program funding for administrative and operational supplies, photocopier and computing supplies for all sites involved in the program are required annually.

iii. Library Services: Fees for UofA Library Services, Program books and subscriptions are required annually. See Appendix M for Library Impact Statement.

iv. Software Upgrades: Annual software upgrades will be required for the VERT, Eclipse, CT and simulator.

v. e-Learning Supplies and Sundries: Office supplies, communications, computer and teaching technologies for eLearning is required to support the distance learning component of the program.

c. Other Direct Costs

i. Travel: As student clinical practicums are located at multiple sites including Edmonton, Calgary and eventually Grande Prairie, Red Deer and Lethbridge, meetings by teaching faculty at these respective sites will be required. As well, teaching faculty will need to travel to attend national meetings of the licensing body and to collaborative meetings of the other radiation therapist degree programs in Canada.

ii. Student Educational Informatics and Learning Management Systems: MedSIS and Moodle

iii. MedSIS and Moodle are the FoMD's educational informatics and learning management systems. A fee for the maintenance and upgrading of this system is required on an annual basis.

iv. Student Liability Insurance: As a student registered in the University of Alberta, the RADTH students are covered under the University's student liability policy.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start Up Costs: Facilities renovations/development of program space

Estimate Form

Estimate # 52200 - 11859C

Contact: Lynne 2-

Project: 3-20 Radiation Therapy Program
Est. By: Cloyd Lowie
Date: 20-Aug-12
Bldg: University Terrace

Scope	Trade Labour (Hours) CR	PT	LS	RS	SM	JP	MW	EP	BC		CT	Material
Design fees, code review and inspections											200	$ 100,000.00
Demo existing desk, screens and offices as required. Demo walls, doors and frames as required												$ 20,000.00
Construct new vert classroom, 2 offices, 2 PBL rooms, and Meeting/Library c/w new doors, frames, sidelights and hardware as required. All walls to u/s structure constructed with sound drywall and insulation Install new sheet flooring in classroom												$ 80,000.00
Install new sound panels as required												$ 20,000.00
rework HVAC system for new classroom c/w crosstalk dampeners												$ 15,000.00
Install services for 3D technology to include Video Conferencing capabilities, services for new podium. Supply and install dimmable lighting and additional switching capabilities for Vert classroom. Install TV monitors.												$ 15,000.00
Install services to accommodate new layout for open area work stations and additional services in existing office. Install services for the photocopier. 40 data and 25 telephones												$ 50,000.00
Install 7 card readers												$ 35,000.00
Install emergency exit hardware as required for fire codes												$ 10,000.00
supply and install 8 new blackout blinds for BPL rooms												$ 6,000.00
Patch and paint entire suite of offices												$ 20,000.00
Supply and install 50 lockers												$ 15,000.00
Construct new high density storage room												$ 20,000.00
signage												$ 3,000.00
air balance												$ 2,500.00
Med Sc 6-28, 6-36 anatomy labs												
Remove existing display boxes, patch and paint as required stall services for 12 monitors and computers. Install 12 work stations for computers												$ 24,000.00
1-46 classroom												
demo wall as required, remove door and frame. Infill wall.												
remove and replace flooring												$ 8,000.00
relocate lighting relay panel. Relocate electrical services as required. Rewire lights as required for smart classroom capabilities. Install services for smart classroom technology												$ 5,000.00
Supply and install 6 powered blinds c/w controls.												$ 12,000.00

3-01 Computer lab												
Demo wall and construct new door and wall for secondary Universal access												$ 8,000.00
Demo exiting furniture and dispose. Remove existing flooring and make good remaining												$ 5,000.00
supply and install new access floor c/w carpet tiles and ramp for universal access												$ 60,000.00
install 18 new power blinds												$ 36,000.00
Install new lights and lighting control for classroom. Install services for 27 work stations. Install services for power screens, Video conferencing and data projectors as required												$ 65,000.00
Replace ceiling grid for new layout												$ 10,000.00
Patch and paint												$ 4,000.00
signage												$ 1,500.00
Air balance												$ 2,000.00
Construction Management fees												$ 27,000.00
Total Labour Hours per Trade:	0	0	0	0	0	0	0	0	0	0	200	
Budget (Hours x $65.00):	0	0	0	0	0	0	0	0	0	0	13000	

Total Budget (Labour Hours)	$ 13,000.00
Total Mat Cost + 1.65% GST:	$ 690,203.50
Sub-Total (Labour/Materials)	$ 703,203.50
Contingency (10%)	$ 70,320.35
Overhead (6.5%)	$ 50,279.05
Escalation 15%	$ 116,028.58
TOTAL ESTIMATE:	**$ 939,831.48**

Note: If work is to proceed, please ensure speed code and account numbers are included.

Note: This is a preliminary budget estimate only. A detailed design may be required for a comprehensive estimate

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start Up Costs: Security upgrades, furniture/signs/telecom/moves

General Office in Edmonton and Calgary

Faculty of Medicine & Dentistry, Department of Oncology

Detailed Listing of Current and Space Programme Requirements
Note: All positions are new to the University of Alberta

Proposed Radiation Therapy Degree Program Space Type	Existing Space - AHS Standard Life Building			Immediate Need (2012/13)			Projected Need (2013/14)			Projected Need (2014/15) Advanced Practice/ M.Sc.		
	Room No.	No. Occ.	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)
A. General Office (Edmonton)												
Director, Radiation Therapy Program		1		1	14	14	1	14	14	1	14	14
Administrative Assistant		1		2	6	12	2	6	12	3	6	18
Radiation Therapist Instructor (Didactic)		2.9		4	11	44	4.5	11	49.5	5	11	55
Radiation Therapist Instructor (Clinical)		0		1	9	9	1.5	6	9	2	6	12
Radiation Therapist - Dosimetrist		0.5		0.5	6	3	0.5	6	3	0.5	6	3
Faculty - Medical Physicist		0		1	3	3	2	3	6	2	3	6
Faculty - Radiation Biologist		0		1	3	3	2	3	6	2	3	6
Faculty - Anatomist		0		1	3	3	1	3	3	1	3	3
Faculty - Radiation Oncologist		0		1	3	3	1	3	3	1	3	3
	Subtotal	5.4		12.5		91	15.5		102.5	17.5		117
General Office (Calgary)												
Radiation Therapist Instructor (Didactic)		1		1			1.5			1.5		
Radiation Therapist Instructor (Clinical)		1		1			1.5			1.5		
Meeting room for VERT laptop				1			1			1		
FTE Totals		7.4		14.5			18.5			20.5		

Includes:

- Bookshelves, locking file cabinets, computer, guest seating, touchdown space (6M2 workstation shared by 2 Faculty) x 4.
- Assumes space is provided by AHS in Calgary and that there are no upgrades required to use laptop VERT in Calgary. No UA space is required.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start-up Costs: Security upgrades, furniture/signs/telecom/moves- Administrative Support Spaces -Edmonton

Faculty of Medicine & Dentistry, Department of Oncology

Detailed Listing of Current and Space Programme Requirements
Note: All positions are new to the University of Alberta

Proposed Radiation Therapy Degree Program Space Type	Existing Space - AHS Standard Life Building			Immediate Need (2012/13)			Projected Need (2013/14)			Projected Need (2014/15) Advanced Practice/ M.Sc.		
	Room No.	No. Occ.	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)
B. Administrative Support Spaces (Edmonton)												
Copy/work room Room				1	11	11	1	11	11	1	11	11
Waiting Area				1	6	6	1	6	6	1	6	6
Filing Room - active student files				1	6	6	1	6	6	1	6	6
Filing Room -accreditation, curriculum				1	10	10	1	10	10	1	10	10
Library - texts and resources				1	3	3	1	3	3	1	3	3
Staff lounge and kitchenette				1	0	0	1	0	0	1	0	0
Meeting Room				1	18	18	1	18	18	1	18	18
	Subtotal					54			54			54

Includes:

- Color copiers/scanner/fax, supply storage, document creation, binding, laminating, shredding, files.
- Waiting room with 4 chairs.
- Locked file cabinets for student records (4 file drawers now, growing to 24 drawers).
- Relocated current high density filing system for files and binders.
- Program/CAMRT/ACMDTT statistical course outline/calendars; curriculum materials; applications.
- 3 Bookcases for text/resources instructor an student use – could be in admin area.
- Shared access to common facilities on the floor.
- 8-10 people training, presentations. Video conference/projector, screen and computer.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start-up Costs: Security upgrades, furniture/signs/telecom/moves- Administrative Support Spaces -Edmonton

Faculty of Medicine & Dentistry, Department of Oncology

Detailed Listing of Current and Space Programme Requirements
Note: All positions are new to the University of Alberta

Proposed Radiation Therapy Degree Program Space Type	Existing Space - AHS Standard Life Building			Immediate Need (2012/13)			Projected Need (2013/14)			Projected Need (2014/15) Advanced Practice/ M.Sc.		
	Room No.	No. Occ.	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)
C. Teaching/Learning Spaces (Edmonton)												
Classroom (shared access)				1	0	0	1	0	0	1	0	0
OSCE suite for patient skills (shared access)				2	0	0	2	0	0	2	0	0
Large Computer Lab (shared) with raised floor for wire management				1	150	150	1	150	150	1	150	150
Small Computer lab/ student PBL rooms				2	18	36	2	18	36	2	18	36

Includes:

- Access to existing classroom for 30 students. Shared/scheduled use space, upgrade to smart classroom (podium and projector).
- Access to existing OSCE space in ZLC or ECHA. Shared/scheduled use space.
- 25 student stations and 2 instructor stations. Lab shared with Radiology. 27 fixed stations are 60” x 24” with 30” HS monitors, computers with upgrades graphics. Instructors need ability to remote log-in to student computers. Ability to projector any computer to front display monitors or medical grade projectors with screens. Access to AHS-Cancer Care Treatment Planning Educational server. Videoconference capability; interprovincial course delivery and meetings. Access to Moodle, Visible body, e-anatomy, Eclipse, PACs. Special printer for treatment plan printing. Research application course.
- 6-8 computer stations in each room (movable partition between two rooms preferred). Stations have 27”HD monitors on 42” tables around room perimeter; flat screen displays. Rooms to be flexible-for PLB, case presentations, small group activities, video conference.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start-up Costs: Security upgrades, furniture/signs/telecom/moves- IT and infrastructure

Proposed Radiation Therapy Degree Program Space Type	Existing Space - AHS Standard Life Building			Immediate Need (2012/13)			Projected Need (2013/14)			Projected Need (2014/15) Advanced Practice/ M.Sc.		
	Room No.	No. Occ.	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)	No. Occ.	Unit Allow	Area (sq. m.)
Server room				1	6	6	1	6	6	1	6	6
VERT Classroom				1	48	48	1	48	48	1	48	48
VERT Classroom - rear projection room				1	24	24	1	24	24	1	24	24
Student lockers - 50 half-size				1	9	9	1	9	9	1	9	9
Student informal meeting area				1	12	12	1	12	12	1	12	12
	Subtotal					285			285			285

Includes:

- Only required if cannot access AHS Cancer Care Treatment Educational server.
- Installation as per VERT manufactures instruction including; 3D rear projection screen, hand controls, wall mounted control panel, instructor touch panel, surround sound speakers; soundproofing needed.
- Flexible for didactic teaching; seating for 30 with narrow table for laptops/writing; ceiling mounted projector and computer/laptop for use as regular classroom; smart podium, smart board.
- Projection room can also be used for secure storage of teaching models; life size anatomical skeletons, thorax, skull, mannequins, etc.
- Access to 50 halfsize lockers- could be in hallway.
- With whiteboard and bulletin board-can be open area. Access to shared student space is acceptable.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start-up Costs: Security upgrades, furniture/signs/telecom/moves- Clinical Teaching Simulation Spaces

Proposed Radiation Therapy Degree Program Space Type	Existing Space - AHS Standard Life Building	Immediate Need (2012/13)	Projected Need (2013/14)			Projected Need (2014/15) Advanced Practice/ M.Sc.		
D. Clinical Teaching Simulation Spaces:								
Linac lite - Procedure room			1	48	48	1	48	48
Support and consoles for Linac lite			1	20	20	1	20	20
CT Simmulator - Procedure room			1	34	34	1	34	34
Support and consoles CT Sim.			1	20	20	1	20	20
Debreifing Room			1	25	25	1	25	25
Office			1	10	10	1	10	10
Female Student change/locker room			1	10	10	1	10	10
Male Student change/locker room			1	10	10	1	10	10
Staff change/locker room			1	5	5	1	5	5
	Subtotal	0			182			182
TOTAL Radiation Therapy Program		**430**			**623.5**			**638**

Includes:

- Linear Accelerator modified for Educational purposes. Installation as per manufacturer.
- Control, observation and debriefing. Space for stretchers and wheelchairs.
- CT sim for educational purposes. Installation as per manufacturer.
- Controls, observation and debriefing, Space for stretchers and wheelchairs.
- 10 students & instructor, use for training, debriefing & waiting area for simulated patients.
- 8 students changing from street clothes to lab coats. Lockers for personal belongings.
- 1 staff changing from street clothes to lab coats. Lockers for personal belongings.
- Note: Linac Lite, CT Sim and support areas should be located close to clinical practice spaces.

Appendix L: RADTH Program Budget Supporting Documentation
One Time Start-up Costs: Teaching Facility Enhancements at the Cross Cancer Institute

RADIATION THERAPY TEACHING SUITE AT CCI - LEVEL "0"
PRELIMINARY COST PLAN **DRAFT 2**

	Area CGSM		Cost Rate (*)			
			$ 4,680			
Option 1 Space Fit	239		$ 1,118,520			
Option 2 Space Fit	203			$ 950,040		
Option 3 Space Fit	213				$ 996,840	
Option 4 Space Fit	211					$ 987,480
		Subtotal	$ 1,118,520	$ 950,040	$ 996,840	$ 987,480
Design/Pricing Contingency		10.00%	$ 111,852	$ 95,004	$ 99,684	$ 98,748
Construction Contingency		7.50%	$ 92,278	$ 78,378	$ 82,239	$ 81,467
		Subtotal	$ 1,322,650	$ 1,123,422	$ 1,178,763	$ 1,167,695
Professional Fees		12.00%	$ 158,718	$ 134,811	$ 141,452	$ 140,123
Escalation		5.00%	$ 66,132	$ 56,171	$ 58,938	$ 58,385
Equipment (major)			$ -	$ -	$ -	$ -
		Total	$ 1,547,500	$ 1,314,404	$ 1,379,153	$ 1,366,203

(*) Cost based on rates provided by Tech-Cost, August 2012

Appendix M – Library Impact Statement

NEW ACADEMIC PROGRAM LIBRARY IMPACT STATEMENT

Proposal for Bachelor of Science in Radiation Therapy
submitted by Faculty of Medicine and Dentistry.

The Faculty of Medicine and Dentistry proposes to implement a Bachelor of Science degree program in Radiation Therapy.

This four year degree will include a foundation year of required courses from the University Calendar, three years of scientific and professional courses administered through the Department of Oncology, as well as a clinical practicum. The program will begin in September 2013, but students will not begin their official coursework in the program until September 2014. Total enrolment will be 15 students in 2014, 35 in 2015, 60 in 2016, 70 in 2017, and will reach its full capacity of 75 students in 2018. 25 new students will be enrolled in the program in each academic year.

Proposed Enrolment	2013-2014	2014-2015	2015-2016	2016-2017
	Accreditation Visit			
Total Full-Time head count	0	15	35	60
• Full-Time Year 1	Pre-professional year in Faculty of Science or Arts			
• Full-Time Year 2	N/A	15	20	25
• Full-Time Year 3	N/A	N/A	15	20
• Full-Time Year 4	N/A	N/A	N/A	15
Anticipated Number of Graduates	0	0	0	15

While the Library holds an outstanding collection of journals, books and databases that support cancer biology, cancer therapy, medical physics, and radiation oncology it will be necessary to acquire some additional resources.

There are two important new journals, with the following subscription costs:

Cancer biotherapy and radiopharmaceuticals - $2,265.00
Cancer Cell – $5,000

To strengthen the collection in this subject area, an initial purchase of 20 e-books will be needed at an approximate cost of $3000.00, as well as an estimated 20 print books at an approximate cost of $3000.00. This will be followed by 15 e-books and 10 print books in subsequent years.

Year one: $6,000
Year two and subsequent years: $3,750

Appendix M – Library Impact Statement (con't)

Librarian instructional time will be required in each of the three years of the program at a cost of $50.00 per hour plus $50.00 for preparation time, for a total of $100.00 per session:

Year one (2014): $100.00
Year two (2015): $200.00
Year three (2016) and subsequent years: $300.00

A number of individual requests for consultation can be expected each year from students completing their assignments. Consultations cost $50.00 per hour plus $50.00 for preparation time, for totals as below:

Year one: $500 (anticipated 5 student consults)
Year two and subsequent years: $2,500 (anticipated 25 student consults).

Access to the Library's electronic resources incurs an annual cost of $200.00 per student. Totals will therefore result as below:

Year one (2014): $3,000 (15 students)
Year two (2015): $7,000 (35 students)
Year three (2016): $12,000 (60 students)
Year four (2017): $14,000 (70 students)
Year five (2018 and subsequent years at program capacity): $15,000 (75 students).

There would be no impact on library space or technology.

Submitted by

Trish Chatterley

Trish Chatterley
Collections Manager
JWScott Health Sciences Library
August 29, 2012

Appendix M – Library Impact Statement (con't)

NEW ACADEMIC PROGRAM LIBRARY IMPACT STATEMENT CERTIFICATION

Submitted to the Academic Development Committee

The Library has examined the proposal for a program in Radiation Therapy.

The attached commentary outlines the anticipated impact on Library services and facilities of the above program, indicating the Library's current ability to support the program and any additional costs it might entail.

We support the changes proposed by the Faculty of Medicine and Dentistry and look forward to working with its instructors and students.

Executive summary of costs

Total Costs	Start Up	Ongoing (expected annual maintenance costs when at peak program capacity)
1. Collections budget	$16,265	$26,015 plus inflation
2. Capital budget	$ --	$ --
3. Operating/staffing budget	$600	$ 2,800
Total Costs:	$16,865	$28,815

Kathryn Arbuckle
Interim Chief Librarian

Marlene Dorgan
Head, John W. Scott Health Sciences Library

Dated: Aug 30/2012