



# BSc RADIATION THERAPY



**UNIVERSITY OF ALBERTA**  
FACULTY OF MEDICINE & DENTISTRY



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# WHAT IS RADIATION THERAPY?

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**Surgery, chemotherapy and radiation therapy are the three main methods—applied alone or in conjunction—of cancer treatment. Radiation therapy uses ionizing radiation, externally or internally, to destroy cancerous cells in the target or affected area, leaving healthy tissues intact.**

## **Targeted cancer care**

External beam radiation (EBRT) uses sophisticated technology to direct the radiation to a focused area of tissue.

Internal beam radiation (IBRT)—or brachytherapy—places radioactive sources directly into a body cavity or the tissue of a tumour.

## **Unique integrative approach**

The field of radiation therapy combines comprehensive technical and scientific expertise with core values of ethics, empathy, patient care and self-reflective practice. Graduates collaborate in an interdisciplinary environment, working alongside a rich variety of health professionals to provide the highest quality of treatment.

The radiation therapist plays a critical role in the planning, verification and delivery of safe and accurate radiation treatment, and helps personalize care through sophisticated technology.

Radiation therapists are responsible for calculating and administering the radiation, as well as assessing and supporting patients. This includes managing their well-being throughout the treatment period, providing education on radiation-induced side effects and dietary requirements, and other support as needed. Some of their main skills include:

- orientation to detail
- demonstrating excellent communication skills to interact effectively with patients, their families and other health-care professionals
- developing an evidence-based and reflective practice



# CURRICULUM

The bachelor of science in radiation therapy degree program (BScRT) at the University of Alberta consists of three distinct components: a pre-professional year, academic courses and clinical courses.

## PRE-PROFESSIONAL YEAR (PREREQUISITES)

The first year of the radiation therapy program is a pre-professional year. These courses can be completed at any Canadian post-secondary institution, provided they are transferable as equivalent credit to University of Alberta courses. All students interested in applying to the program must have completed, or be in the process of completing, the following courses:

**Statistics 3\***

**Cell Biology 6\***

**English 3\***

**General Chemistry 3\***

**Organic Chemistry 3\***

**Calculus Math 3\***

**Physics 6\***

**Psychology/Sociology 3\***

(\* = credits)





# CURRICULUM

## YEAR 2

- Cancer Biology
- Principles of Oncology
- Concepts and Applications in Medical Physics
- Introduction to Cell Biology
- Patient Care Principles and Practices
- Human Physiology
- Radiation Protection and Safety
- Human Morphology
- Therapeutic and Imaging Equipment in Radiation Therapy
- Introduction to Oncology
- Radiation Therapy Clinical Practicum I

## YEAR 3

- Radiobiology
- Principles and Practices in Radiation Therapy
- Treatment Planning and Dosimetry I & II
- Cross-Sectional Anatomy
- Health Care Advocacy and Policy
- Clinical Oncology I & II
- Imaging Principles and Analysis in Radiation Therapy
- Interprofessional Health Team Development
- Clinical Simulation and Reasoning
- Radiation Therapy Research Methodology

## YEAR 4 - CLINICAL PLACEMENTS

- Radiation Therapy Clinical Practicum II & III

From introduction to the patient experience through radiation-therapy planning, to supervised practice within the clinical environment, the 38 weeks of placement or practicum are designed to progressively guide students into real-life application of their skills and knowledge. Students are immersed in a health care role where they attain the core skill sets and expertise to become practice-ready radiation therapy practitioners.

The clinical practicums take place at centres providing radiation therapy treatment services across Alberta.

VERT is a virtual simulator which allows students to practice skills in a highly realistic environment.



# PROGRESSIVE LEARNING ENVIRONMENT

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**The University of Alberta's radiation therapy program is a one-of-a-kind, competency-based program that combines classroom learning, laboratory experiences, simulated scenarios and real clinical experiences to teach the concepts and theories behind radiation therapy, patient care and professional practice.**

“ The radiation therapy program at U of A has provided me with a unique educational experience featuring a mix of applied learning through state-of-the-art technology, clinical experience and lectures. I believe the structure of the program has benefited and prepared me for my future career. It has been a great experience with friendly and motivated peers and instructors. ”

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Neil Guest  
BScRT student



# LEARNING ENVIRONMENT

## ENGAGING CLASSROOM ENVIRONMENT

Learning and innovation go hand in hand. The program's curriculum has been designed to allow for the incorporation of social media, SMART boards, e-portfolios, virtual reality technology and various medical software systems to support the achievement of student learning outcomes.

## SMALL GROUPS

Students are placed in small cohorts to ensure their progress and clear understanding of the program content, as well as their future success in job placement. Small groups facilitate a personalized learning experience during classroom and clinical courses.

## SKILL LABS

Labs are conducted using a wide array of techniques and diverse tools offered by the University of Alberta, including an advanced computer lab that provides students with access to medical software systems and the VERT simulator to bring theoretical course concepts to life.

## COMPASSIONATE CLINICAL CARE

The University of Alberta aims to develop patient-centred practitioners who are able to deliver their care with compassion and mindfully adapt to meet the unique needs of a culturally diverse population.

## SOCIAL RESPONSIBILITY AND CITIZENSHIP

The radiation therapy program promotes the development of altruistic professionals who engage and grow within the community as scholars, leaders and health-care advocates.

## MOVING PRACTICE FORWARD

The BScRT is a professional program designed to translate knowledge and skills into direct impact on patients' outcomes. Radiation therapists are critical to ensure patient well-being, using precision and strategic management of treatment.

## IMMERSIVE SIMULATION

VERT is a virtual reality simulator that allows students to practise skills in a realistic environment. Students view a life-size virtual representation of a treatment machine using 3-D glasses, operate its physical hand controls, and visualize radiation dose deposition and internal anatomy.

This simulation allows students to interact with real-world equipment and build their skills before entering clinical environments.

## STATE-OF-THE-ART TREATMENT TRAINING SUITE

Located within the Cross Cancer Institute in Edmonton, this space features a full-size linear accelerator that offers full imaging capabilities without delivering therapeutic radiation. It provides students with an opportunity for active learning within a comfortable, safe and controlled environment. Here, learners apply key skills, concepts and behaviours to case-based patient scenarios, practising on an anatomical mannequin and with standardized patients (patient actors) and volunteers.

The unique training suite offers the latest in linear accelerator technology used in radiation therapy treatment for oncology patients. It features Objective Structured Clinical Examination (OSCE) capabilities, using video capture for both testing and training purposes.



# CERTIFICATION

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**Graduates of the program receive a bachelor of science in radiation therapy from the University of Alberta. To become practising radiation therapists, students are required to successfully complete the CAMRT certification examination.**

Upon successful program completion, graduates can apply to the Canadian Association of Medical Radiation Technologists (CAMRT) to challenge the national certification competency-based examination.

Graduates who have successfully completed the CAMRT certification examination are licensed to practise as radiation therapists in Canada. This certification also makes them eligible to work in many other countries around the world.

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Early exposure to practice clinical skills is essential for setting students up for success.





# WHERE WILL YOUR DEGREE TAKE YOU?

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Radiation therapists can work in cancer-care facilities with radiation therapy treatment services and are able to develop their profession through research, education and advanced practice.

In addition to being clinical practitioners, radiation therapists have the opportunity to develop their career in the following areas:

**Brachytherapy:** Advanced cancer treatment using the insertion of a sealed radioactive source into or in close proximity to a tumour.

**Dosimetry:** Measuring and calculating the dose of ionizing radiation used for the daily treatment of a cancer patient, based on a radiation oncologist's prescription.

**Clinical education:** Given the rapidly changing and sophisticated patient-care protocols and radiation therapy technology, clinical educators who maintain relevant and up-to-date knowledge and skills are vital for the teaching of future professionals.



## Britny, BScRT Student

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“I love how the radiation therapist’s role incorporates critical thinking and problem-solving with rapidly evolving technology and patient care. The opportunity to develop relationships with patients over the course of multiple weeks has made my experience in clinic very rewarding.

If you are a friendly, compassionate individual who loves advancing technology and biology, radiation therapy may be a fantastic career for you.”

## Chad, BScRT Student

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“Cancer care is challenging but also very rewarding. A career in radiation therapy allows you to learn so much about yourself and what compassionate care means through daily interactions with our patients.”



# MEET OUR STUDENTS

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## **COMPASSIONATE CARE MEETS CUTTING-EDGE TECHNOLOGY**

**As future radiation therapists, our students experience teamwork and patient interaction, and join a community of cancer-care professionals with a direct impact on improving people's health.**



## Elizabeth, BScRT Student

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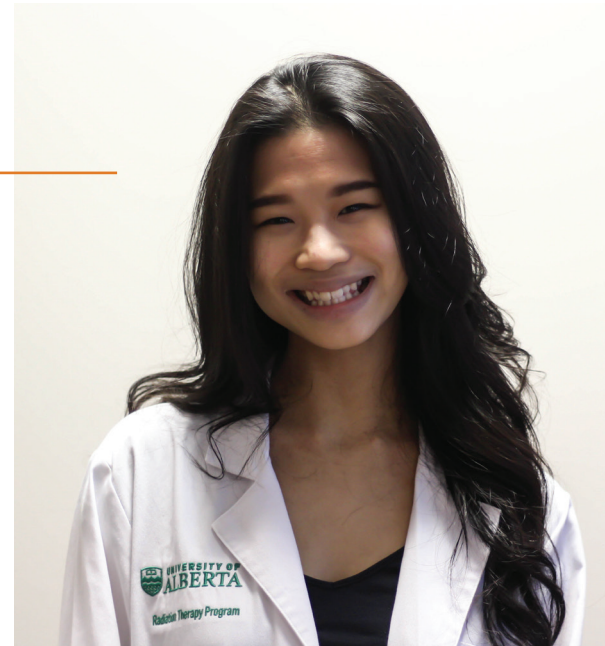
“The radiation therapy field is dynamic—technology is always improving, techniques are evolving, and patient-care techniques are always advancing—this makes the job very interesting, keeps me on my toes and enables me to be a lifelong learner.”

## Sarah, BScRT Student

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“Radiation therapy is my opportunity to make small but mighty differences in the daily lives of patients, families, colleagues and other professionals involved with cancer care. I am excited about the ever-changing nature of the work, interacting with individuals of diverse backgrounds and experiences that come together for a common cause.

I love the unique role of a radiation therapist within the greater cancer support network, and the best part about the radiation therapy program is growing as a therapist among an incredibly fun and supportive group of faculty, staff and classmates.”



# STUDENT LIFE

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## **RADIATION THERAPY STUDENT ASSOCIATION**

### **Building relationships and creating opportunities**

The University of Alberta's radiation therapy student body is a small cohort of big talents, and the Radiation Therapy Student Association's main goal is to help students shine.

We host social events, collaborate with other Faculty of Medicine & Dentistry student groups, and organize learning opportunities with professionals from the community. Most important, we listen to our students and strive to improve the radiation therapy student experience.

Curious about the RT student life? Contact us.

### **RTSA (Radiation Therapy Student Association)**

**[rtsa@ualberta.ca](mailto:rtsa@ualberta.ca)**

8303 112th St. NW

Edmonton, AB

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“The practice of radiation therapy is truly one of a kind”

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**SUSAN FAWCETT**

DIRECTOR, RADIATION THERAPY PROGRAM

*“The modern state university has sprung from a demand on the part of the people themselves... The people demand that knowledge shall not be the concern of scholars alone. The uplifting of the whole people shall be its final goal. This should never be forgotten.”*

Henry Marshall Tory

# DIRECTOR'S MESSAGE

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I am excited to introduce the radiation therapy program at the University of Alberta's Faculty of Medicine & Dentistry.

The practice of radiation therapy is truly one of a kind—interdisciplinary and collaborative, it involves a variety of health professionals, research scientists, clinical practice leaders and provincial health systems.

We have adopted this collaborative educational model to ensure a holistic approach to caring for patients with cancer. We support learners' progression from knowledge to skill acquisition through to competency and clinical reasoning.

Our program partners with Alberta Health Services' CancerControl Alberta to provide a clinical learning experience that promotes the development of competent, critical-thinking radiation therapists who practise in a caring, reflective, evidence-based manner.

At the Faculty of Medicine & Dentistry, we have a strong commitment to our patients, their families and the populations we serve. We endeavour to foster the development of radiation therapists who are committed to excellence in patient-centred professional practice and embody lifelong learning.

The BScRT program provides graduates with the comprehensive professional expertise to accompany patients through their journey of cancer treatment. Understanding that the field of cancer care requires constant innovation, we are developing future options for specialized education and continued professional growth. We are excited to provide the tools to build a very bright future for our future colleagues and for our communities.

**SUSAN FAWCETT**

DIRECTOR, RADIATION THERAPY PROGRAM  
FACULTY OF MEDICINE & DENTISTRY



**For more information on the RADTH Program and admissions, please contact:**

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