RADIATION THERAPY PROGRAM

Health Professions Building Room 220
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www.health.txstate.edu/rtt (http://www.health.txstate.edu/rtt)

The radiation therapist is a key member of the professional team, which uses various forms of radiation to treat cancer patients. Radiation therapy may be used alone, or in combination with surgery or chemotherapy, and is the treatment of choice for cure of many cancers. Because of sustained contact with patients, the radiation therapist has considerable responsibility in patient care, dietary counseling and treatment evaluation. The radiation therapist must also appreciate the significant psychological impact that cancer has on patients and their families. The program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT). The curriculum complies with the professional curriculum of the American Society of Radiologic Technologists.

The degree program, Bachelor of Science in Radiation Therapy with a major in Radiation Therapy, is a two- and one-half year program beginning in the junior year. The junior and senior years combine clinical experiences in the affiliated radiation therapy facilities with advanced academic study in the professional disciplines. The program is designed to prepare students for the technical, theoretical, and psychological aspects of this career. Students acquire the technical skills necessary to plan, deliver, and record a prescribed course of radiotherapy. Upon completion of the degree, students are eligible to apply to the ARRT national registry examination.

Any student entering Texas State may declare Pre-Radiation Therapy as their major. Admission to Texas State does not guarantee admission to the program. Admission to the program is competitive and selective. It is recommended that students arrange academic advising at least once prior to making application. The academic sequence begins during the fall semester. Enrollment is limited by student/faculty ratios in the clinical components of the program. The deadline for submission of applications is January 15.

General Admission Requirements
1. Admission to Texas State
2. Satisfactory completion of all general education requirements and a minimum overall GPA of 2.75.
3. Any student who did not complete at least two years of the same foreign language in high school is required to take 6-8 hours of the same foreign language.
4. Applicants must have a Science and Support Course GPA of 3.0 or higher. No more than 2 attempts on any one science course is permitted. An applicant may repeat only one of the courses on this list. Courses included in the Science and Support Course GPA computation include:
   a. BIO 1320 Modern Biology I, Molecules, Cells, and Physiology 3
   or BIO 1330 Functional Biology
   BIO 1421 Modern Biology II, Organisms, Evolution, and Environment (or BIO 1331 and BIO 1131) 4
   BIO 2430 Human Physiology and Anatomy 4
   AT 3358 Clinical Pathopharmacology 3
   or PSY 4390 Psychopharmacology
   CHEM 1341 General Chemistry I 3
   CHEM 1141 General Chemistry Laboratory I 1
   PSY 1300 Introduction to Psychology 3
   MATH 2417 Pre-Calculus Mathematics 4
   or MATH 247 Calculus I
   PHYS 1320 Elementary Physics 3
   or PHYS 131 General Physics I
   or PHYS 132 General Physics II
   PHYS 1110 Elementary Physics Laboratory 1
   or PHYS 111 General Physics I Laboratory
   or PHYS 112 General Physics II Laboratory
   HP 3302 Biostatistics 3
   or PSY 2301 Introduction to Statistics
   or SOCI 3307 Statistics for the Behavioral Sciences
   or MATH 232 Elementary Statistics
   or CJ 3347 Statistics For Criminal Justice
5. See Academic Services section of the catalog for course options that satisfy literature components.
6. Completion of an application packet for admission.
7. Three letters of reference and a career goal statement.
8. Successful interview of selected candidates with admission committee.
9. 40 hour clinical observation with completed evaluation on file by Jan.
10. Students must be able to perform the 13 Technical Standards indicated by the American Disabilities Act (refer to program website or department for more information).
11. Previous misdemeanor or felony convictions will affect admission to the program.

Academic Progression
Students enrolled in the Radiation Therapy Program are required to maintain a grade of “C” or better in all coursework. Radiation Therapy courses are offered in a lock-step sequence. Each course is offered only once each academic year; therefore, progress in the program is affected should a student fall out of the sequence due to failure to successfully complete a course. A student who falls out of sequence (whether due to illness, course failure, or other reasons) will be delayed one year to repeat the course. In addition, a student may repeat a radiation therapy course only once. If the student does not earn a grade of at least “C” upon repeating the course, the student cannot continue in the program.

Graduation
To graduate with a Bachelor of Science in Radiation Therapy Degree, a student must successfully fulfill the general education requirements and complete all radiation therapy courses with a “C” or better. The student must meet the requirements for clinical competency as described in the Directed Clinical Learning syllabi. Graduation students must have attained a 2.0 or higher Texas State University GPA with a minimum of a 2.75 GPA in the Radiation Therapy major.

Immunization Requirements
It is a policy of the College of Health Professions that each student must provide a Health Report completed by a physician or licensed healthcare provider, and must take certain immunizations before the student can
be placed in a clinical or internship assignment. Information on these requirements and forms to be supplied may be obtained through the program office.

**Criminal Background Check/Drug Screening**

As a condition for placement in some professional practice sites, students are required to have a background check and/or drug screening and meet other requirements set by individual sites. Information on the process of drug screening will be provided by the program. Previous misdemeanor or felony convictions under various titles of the Texas Penal Code may affect eligibility for state license status following graduation and may affect admission consideration to the Radiation Therapy program.

**Admissions Requirements**

1. Any student entering Texas State may declare Pre-Radiation Therapy as their major. Admission to Texas State does not guarantee admission to the program. Admission to the program is competitive and selective. It is recommended that students arrange academic advising at least once prior to making application.
2. The academic sequence begins during the fall semester. Enrollment is limited by student/faculty ratios in the clinical components of the program.
3. The deadline for submission of applications is January 15.

**Bachelor of Science in Radiation Therapy (B.S.R.T.)**

- Major in Radiation Therapy (http://mycatalog.txstate.edu/undergraduate/health-professions/radiation-therapy-program/bsrt)

**Courses in Radiation Therapy Technology (RTT)**

**RTT 3120. Clinical Simulation Lab I.**

Students are provided instruction and simulated practice in a controlled laboratory setting. This course provides first-year students foundational clinical set-up skills from which to build on during the clinical learning practicum course

1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3121. Clinical Simulation Lab II.**

Students are provided instruction and simulated practice in a controlled laboratory setting. This course provides instruction, demonstration and participation in immobilization, positioning and simulation with the aid of an anthropomorphic phantom. Students will learn aspects of simulation for basic treatment delivery applications

1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3220. Directed Clinical Learning I.**

Students will observe the basic operations of the radiation oncology clinic while interacting with the multidisciplinary team involved in providing treatment and care. The student will be introduced to oncology terminology, equipment, and techniques used for treatment. Learning is achieved through direct patient care, with instruction, demonstration and direct supervision. Prerequisite: Acceptance into the major

2 Credit Hours. 1 Lecture Contact Hour. 16 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3221. Directed Clinical Learning II.**

Students will gain additional skills in clinical procedures, interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experience under the supervision of a registered radiation therapist. Students are tested on intermediate clinical radiation therapy skills

2 Credit Hours. 1 Lecture Contact Hour. 16 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3300. Patient Care in Radiation Oncology.**

This course will focus on basic nursing concepts involved in providing care for the cancer patient. Topics to be included in the class will be cancer as a chronic health problem, social roles and cancer, multidisciplinary approach to patient care, psychosocial dimension of cancer, in-treatment examinations, follow-up examinations, emergency management, chemotherapy and nutritional aspects of treating patients with cancer

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3301. Introduction to Radiation Oncology.**

An overview of radiation oncology and the role of the radiation therapist. Presentations will orient the student to the physical and biological basis of radiation equipment, procedures, tumor pathology, and patient interaction. (WI)

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

**Course Attribute(s):** Writing Intensive

**Grade Mode:** Standard Letter

**RTT 3302. Radiologic Science and Medical Imaging.**

This course will cover the principles governing production of radiation, interaction of radiation with matter, and protection of the radiation worker and patient from exposure. Basic principles of x-ray equipment, exposure factors, latent image formation, and processing of radiographs are presented. Prerequisite: Program Director’s approval

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

**Grade Mode:** Standard Letter

**RTT 3310. Physics of Radiation Therapy I.**

Students will learn the principles of radiation physics as they apply to the treatment and care of the cancer patient. Course will include a thorough review of x-ray production, fundamental principles, concepts and terminology. Topics studied include measurements, general principles, structure of the atom, structure of the matter, electrostatics, magnetism, electrodynamics, electromagnetism, rectification and production and properties of radiation and radiographic techniques

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

**Grade Mode:** Standard Letter
RTT 3314. Radiation Therapy Sectional Anatomy.
The course provides instruction in identifying cross-sectional anatomy
to develop the ability to make anatomic correlations between multiple
planes of view. Major organs, lymphatics, vessels are emphasized as
related to the clinical significance in the field of radiation therapy
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 3350. Radiobiology.
This course will cover the principles of cell response to radiation,
including tissue sensitivity, survival, repair and the latent effects of
irradiated tissue. Topics to be covered include the development of
radiation science, cellular targets for radiation action, target theory,
physical/chemical factors affecting radiation response, biological
factors, repair and recovery, fractionated doses and dose rate, early/
acute effects of whole body exposure, late/chronic effects of whole body
exposure, and radiation protection dose guidelines
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4120. Clinical Simulation Lab III.
Students are provided instruction and simulated practice in a controlled
laboratory setting. A continuation of RTT 3121. This course provides
instruction, demonstration, and participation in immobilization,
positioning and simulation with the aid of an anthropomorphic phantom.
Students will learn aspects of simulation for basic intermediate treatment
delivery applications
1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4121. Clinical Simulation Lab IV.
Students are provided instruction and simulated practice in a controlled
laboratory setting. A continuation of RTT 4120. This course provides
instruction, demonstration, and participation in immobilization,
positioning and treatment simulation. Students will learn aspects of
simulation for basic, intermediate, and some advanced treatment delivery
applications
1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4122. Clinical Simulation Lab V.
Students are provided instruction and simulated practice in a controlled
laboratory setting. A continuation of RTT 4121. This course provides
instruction, demonstration, and participation in immobilization,
positioning and treatment simulation. Students will learn aspects of
simulation for basic, intermediate, and some advanced treatment delivery
applications
1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4189. Radiation Therapy Literary Scholarship and Manuscript Writing.
This intensive writing course provides instructions in research strategies,
critical review and analysis of peer reviewed publications. An introduction
to scholarly resources and professional manuscript development using
peer reviewed journal guidelines for the profession of radiation therapy.
This course prepares students for RTT 4191 Radiation Therapy Seminar.
(WI)
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter

RTT 4190. Professional Issues in Radiation Therapy.
This capstone course provides a comprehensive review of the program
curriculum and clinical practice in the field. Current radiation therapy
treatment management techniques and issues are presented for analysis
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

RTT 4191. Radiation Therapy Seminar.
This course is a continuation of RTT 4189. The course provides
instruction in the completion of a final draft for the student’s technical
manuscript. The course work builds from the completed manuscript and
draws from the material and knowledge gained in RTT 4189 to develop a
formal presentation
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4220. Directed Clinical Learning III.
Students will continue to develop skills during this clinical course.
Progressive interaction with patients and professional personnel
are monitored as students practice radiation therapy in a supervised
setting. Additional areas include problem solving, identifying machine
components and basic side effect management. Students will
demonstrate competence in beginning, intermediate and some advanced procedures
2 Credit Hours. 1 Lecture Contact Hour. 24 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4221. Directed Clinical Learning IV.
The course provides students the opportunity to continue to develop
confidence and increased skill in simulation and treatment delivery.
Students will demonstrate competence in beginning, intermediate, and
some advanced procedures through supervised clinical instruction,
progressing through a competency-based educational sequence
2 Credit Hours. 1 Lecture Contact Hour. 24 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4222. Directed Clinical Learning V.
The students will complete their clinical training by practicing all the
skills they have learned in the classroom, lab, and clinical practicum.
The students will continue demonstrating proficiency while completing the
Skills Competency Checklist
2 Credit Hours. 1 Lecture Contact Hour. 24 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4291. Professional Issues in Radiation Therapy.
This capstone course provides a comprehensive review of the program
curriculum and clinical practice in the field. Current radiation therapy
treatment management techniques and issues are presented for analysis
2 Credit Hours. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4310. Physics of Radiation Therapy II.
Students will continue to learn the principles of cell response to
radiotherapy. Topics covered will include properties of x-ray and gamma
radiation, radiation units, x-ray production, photon interactions, beam
characteristics, radioactivity, treatment units, and particle irradiation
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
RTT 4330. Quality Assurance.
Students will study quality assurance tests related to patient charts, treatment accessories, patient communication devices, machine reading and safety devices. Emphasis on quality control procedures to include Continuous Quality Improvement (CQI), Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and responsibilities of each team member in relation to quality assurance duties.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4331. Operational Issues in Radiation Therapy.
Course content is designed to focus on various radiation therapy operational issues. Accreditation, CQI development and assessment techniques will be presented. Human resource issues and regulations impacting the radiation therapist will be examined. Topics include the role of network information systems within the radiation oncology department. (WI)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter

RTT 4360. Dosimetry I.
This course will cover the basic concepts in treatment planning and clinical dosimetry. Students will learn to identify treatment preparation processes and needs for beam modifying devices. Students will also be taught isodose charts for several treatment arrangements and be able to calculate a variety of external beam treatment formulas.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4361. Dosimetry II.
Students will learn additional concepts in treatment planning and clinical dosimetry addressed in Dosimetry I. Computerized treatment planning applications will enhance the understanding of medical dosimetry.
3 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

RTT 4370. Clinical Radiation Oncology I.
The first of a two-part course, this course advances the student’s knowledge of neoplastic disease management. Instruction will focus on the regional anatomy and physiology, epidemiology and etiology, detection and diagnosis, diagnostic procedures, histopathology, patterns of spread principles of treatment, staging, and prognosis.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

RTT 4371. Clinical Radiation Oncology II.
The second of a two part course, this course is a continuation of disease specific instruction. Instruction will focus on the regional anatomy and physiology, epidemiology and etiology, detection and diagnosis, diagnostic procedures, histopathology, patterns of spread, principles of treatment, staging, and prognosis. Prerequisite: RTT 4370
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter