

# RADIATION THERAPY (XRT)

## XRT 4310 - Radiation Physics

2 Credits

This course provides a study of atomic structure, radioactive decay modes, x-ray production, mathematics of decay, and interaction of radiation with matter. Radiation units, regulations regarding maximum permissible exposures to radiation, radiation monitoring and surveying, and principles of radiation protection are covered along with concepts in dosimetry. Offered Fall semester only.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4320 - Radiation Therapy Practice I

3 Credits

This course is an introduction to radiation therapy practice and the practitioner's role. Principles of radiation therapy treatment, health safety, ethics, the radiation therapy professional's scope of practice and responsibilities will be discussed and examined. Basic operational issues will be discussed, including treatment parameters and delivery, equipment and emergency procedures. (Offered Fall semester only)

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4330 - Treatment Techniques I with Lab

2-3 Credits

This course will introduce concepts and terminology of radiography and radiation therapy treatment set-ups. It will examine anatomy, positioning, immobilization, field boundaries, and standard beam arrangements for site-specific anatomical areas. Laboratory experiences include virtual simulation demonstrations and conventional/CT simulator practice with a phantom.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4340 - Treatment Planning

3 Credits

This course will introduce concepts and terminology of radiation therapy treatment planning with an introduction to dosimetry. Students will examine and practice anatomical site-specific treatment planning which incorporates imaging, target volume delineation and dose prescription, delineation of organs at risk, and dose limitations. Included is a discussion on beam arrangements, energies, modalities, modifiers, calculations and dose evaluation. Demonstrations and practice with computer treatment planning systems enhances the course. This course is delivered in a multimodality, hybrid learning format.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4350 - Clinical Practicum I/Senior Seminar

2-10 Credits

This practicum course includes content and clinical practice experiences that are designed for sequential development, application, analysis, integration, synthesis and evaluation of concepts and theories in radiation therapy. Clinical practice experiences shall be designed to provide care to the patient in the therapeutic setting for simulation, treatment planning and administration of a prescribed course of treatment. Evaluation of competency and outcomes measurement of the student's clinical practice shall assure the well-being of the patient preparatory to, during and following delivery of radiation therapy treatment and services.

**Prerequisite(s):** CORE 1500\* ; CORE 1000

\* Concurrent enrollment allowed.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

**Attributes:** IPE - Clinical Immersion, UUC:Reflection-in-Action

## XRT 4360 - Advanced Imaging Modalities

2 Credits

This course is designed to introduce students to the foundation of advanced imaging and the technologies and techniques associated with imaging modalities within radiation therapy.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4420 - Radiation Therapy Practice II

3 Credits

This course is designed to examine and evaluate the management of neoplastic disease. The epidemiology, etiology, detection, diagnosis, patient condition, treatment and prognosis of neoplastic disease will be presented, discussed and evaluated in relationship to histology, anatomical site and patterns of spread. The radiation therapist's responsibility in the management of neoplastic disease will be presented and discussed.

### Restrictions:

Enrollment is limited to students with a major in Radiation Therapy.

## XRT 4430 - Treatment Techniques II

2 Credits

This course will introduce concepts and terminology of radiography and radiation therapy treatment set-ups. It will examine anatomy, positioning, immobilization, field boundaries, and standard beam arrangements for site-specific anatomical areas. Laboratory experiences include virtual simulation demonstrations and conventional/CT simulator practice with a phantom.

**XRT 4440 - Clinical Dosimetry**

3 Credits

Reviews basic concepts introduced in Treatment Planning, further examining factors that influence and govern dose determination and planning treatment for radiation therapy patients. Emphasizes the clinical application of photon and electron beam characteristics, dose calculations, and factors relating to safely and optimally treating the radiation therapy patient. Some focus is directed on clinical dosimetry and treatment planning for radiation oncology special procedures. Demonstrations and practice with computer treatment planning systems enhances the course. This course is delivered in a multimodality, hybrid learning format.

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**XRT 4450 - Clinical Practicum II/Senior Seminar II**

7-8 Credits

This course is a continuation of XRT 4350 Clinical Practicum I which includes the application, analysis, integration, synthesis and evaluation of concepts and theories in radiation therapy. Clinical practice experiences shall be designed to provide care to the patient in the therapeutic setting for simulation, treatment planning and administration of a prescribed course of treatment. Evaluation of competency and outcomes measurement of the student's clinical practice shall assure the well-being of the patient preparatory to, during and following delivery of radiation therapy treatment and services.

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**XRT 4500 - Radiation Oncology Patient Care and Quality Management**

3-4 Credits

This course provides foundational concepts in assessment and evaluation of the patient undergoing radiation therapy along with the responsibilities of the radiation therapist in caring for the patient. Psychological and physical needs affecting treatment outcomes will be presented. Incorporated into the course are the principles and guidelines of a quality management program in radiation oncology, including clinical process, equipment, and documentation that demonstrate patient care outcomes. Additionally, regulatory agencies and rules affecting the radiation oncology workplace, staff, and patients are emphasized. The role of the radiation therapist in patient care, safety and quality management is stressed.

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**XRT 4510 - Radiobiology and Radiation Protection**

2 Credits

This course presents basic concepts and principles of radiation biology integrated with radiation protection. The interactions of radiation with cells, tissues and the body as a whole and resultant biophysical events will be presented. Also covered are the basic concepts of radiation protection, radiation monitoring, environmental protection, the safe handling of radioactive materials, equipment use, and quality control. Radiation safety in radiation therapy departments and regulations that govern the use of radioactive is presented. The course provides a thorough examination of radiation safety from both the patient and therapist perspective. (Offered Fall semester only)

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**XRT 4550 - Clinical Practicum III/Senior Seminar III**

11 Credits

This course is a continuation of XRT 4450 Clinical Practicum II which includes the application, analysis, integration, synthesis and evaluation of concepts and theories in radiation therapy. Clinical practice experiences shall be designed to provide care to the patient in the therapeutic setting for simulation, treatment planning and administration of a prescribed course of treatment. Evaluation of competency and outcomes measurement of the student's clinical practice shall assure the well-being of the patient preparatory to, during and following delivery of radiation therapy treatment and services.

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**XRT 4800 - Capstone in Radiation Therapy**

1 Credit

Students enrolled in this course develop an individual research project for presentation that is a culmination of the knowledge obtained in the didactic and clinical coursework within the Radiation Therapy Program. This project is worked on independently with program faculty mentorship and is required for graduation. Some didactic review and professional development content is included.

**Prerequisite(s):** CORE 1900; CORE 1500; CORE 1200\*; CORE 2500\*; CORE 1000

\* Concurrent enrollment allowed.

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.

**Attributes:** UUC:Self in the World

**XRT 4980 - Advanced Independent Study in Radiation Therapy**

1 or 3 Credits (Repeatable for credit)

**Restrictions:**

Enrollment is limited to students with a major in Radiation Therapy.