RADIATION THERAPY (XRT)

XRT 4310 - Radiation Physics
Credit(s): 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. Pre-requisites: MATH 1400 Precalculus, PHYS 1220 & 1240 General Physics I & II.
Prerequisite(s): MATH 1400 with a grade of C or higher; PHYS 1220 with a grade of C or higher; PHYS 1240 with a grade of C or higher

XRT 4320 - Radiation Therapy Practice I
Credit(s): 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. Pre-requisites: HSCI 3300/3310 and HSCI 3400/3410 Anatomy & Physiology I & II with lab, ORES 2310 Intro to Clinical Medicine, IPE 4200 Applied Decision Making Co-requisites: XRT 4330 Treatment Techniques, XRT 4360 Emerging Technologies.
Prerequisite(s): HSCI 3300 with a grade of C or higher; HSCI 3310 with a grade of C or higher; HSCI 3410 with a grade of C or higher; ORES 2310 with a grade of C or higher

XRT 4330 - Treatment Techniques
Credit(s): 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. Offered Fall semester only. Pre-requisites: HSCI 3300/3310 and HSCI 3400/3410 Anatomy & Physiology I & II with lab, HSCI 3010 Medical Terminology. Co-requisites: XRT 4320 Radiation Therapy Practice I, XRT 4360 Emerging Technologies.
Prerequisite(s): HSCI 3010 with a grade of C or higher; HSCI 3300 with a grade of C or higher; HSCI 3310 with a grade of C or higher; HSCI 3400 with a grade of C or higher; HSCI 3410 with a grade of C or higher

XRT 4340 - Treatment Planning
Credit(s): 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. Offered Fall semester only. Pre-requisites: HSCI 3300/3310 and HSCI 3400/3410 Anatomy & Physiology I & II with lab Co-requisites: XRT 4320 Radiation Therapy Practice I, XRT 4330 Treatment Techniques.
Prerequisite(s): HSCI 3300 with a grade of C or higher; HSCI 3310 with a grade of C or higher; HSCI 3400 with a grade of C or higher; HSCI 3410 with a grade of C or higher
Corequisite(s): XRT 4320, XRT 4330

XRT 4350 - Clinical Practicum I
Credit(s): 2-6 Credits (Repeatable for credit)
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. Offered in the Spring semester only. Pre-requisites: XRT 4320 Radiation Therapy Practice I, XRT 4330 Treatment Techniques, XRT 4360 Emerging Technologies, XRT 4340 Treatment Planning.
Prerequisite(s): XRT 4320 with a grade of C or higher; XRT 4330 with a grade of C or higher; XRT 4340 with a grade of C or higher; XRT 4360 with a grade of C or higher

XRT 4360 - Emerging Technologies
Credit(s): 2 Credits
This course will introduce basic x-ray production and its uses plus advanced imaging technologies. A study of human anatomy as it relates to radiographic films and cross sectional human anatomy is also covered. Offered Fall Semester only. Pre-requisites: HSCI 3300/3310 and HSCI 3400/3410 Anatomy & Physiology I & II with lab Co-requisites: XRT 4320 Radiation Therapy Practice I, XRT 4330 Treatment Techniques.
Prerequisite(s): HSCI 3300 with a grade of C or higher; HSCI 3310 with a grade of C or higher; HSCI 3400 with a grade of C or higher; HSCI 3410 with a grade of C or higher

XRT 4420 - Radiation Therapy Practice II
Credit(s): 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. Offered Spring semester only. Pre-requisites: XRT 4320 Radiation Therapy Practice I, XRT 4330 Treatment Techniques, XRT 4360 Emerging Technologies.
Prerequisite(s): XRT 4320 with a grade of C or higher; XRT 4330 with a grade of C or higher; XRT 4360 with a grade of C or higher
XRT 4440 - Clinical Dosimetry  
Credit(s): 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 safety 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. Offered Spring semester only. Prerequisites: XRT 4310 Radiation Physics, XRT 4340 Treatment Planning. 
Prerequisite(s): XRT 4310 with a grade of C or higher; XRT 4340 with a grade of C or higher; XRT 4350 with a grade of C or higher

XRT 4450 - Clinical Practicum II  
Credit(s): 0 or 2 Credits (Repeatable for credit)  
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. Offered in the Summer semester only. Pre-requisite: XRT 4350 Clinical Practicum I. 
Prerequisite(s): XRT 4350 with a grade of C or higher

XRT 4500 - Radiation Oncology Patient Care and Quality Management  
Credit(s): 3 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. Offered Fall semester only. Co-requisite: XRT 4320 Radiation Therapy Practice I. 
Prerequisite(s): MATH 1400 with a grade of C or higher; PHYS 1220 with a grade of C or higher; PHYS 1240 with a grade of C or higher 
Corequisite(s): XRT 4320

XRT 4510 - Radiobiology and Radiation Protection  
Credit(s): 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. Pre-requisites: MATH 1400 Pre-calculus, PHYS 1220 & 1240 General Physics I&II Co-requisite: XRT 4310 Radiation Physics. 
Corequisite(s): XRT 4310

XRT 4930 - Special Topics  
Credit(s): 3 Credits (Repeatable for credit)

XRT 4960 - Capstone in Radiation Therapy  
Credit(s): 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. Pre-requisite: All radiation therapy program courses.

XRT 4980 - Independent Study  
Credit(s): 1 or 3 Credits (Repeatable for credit)

XRT 5930 - Special Topics  
Credit(s): 3 Credits (Repeatable for credit)

XRT 5980 - Radiation Therapy Independent Study  
Credit(s): 1-3 Credits (Repeatable for credit)  
This is an independent study, contracted course for the radiation therapy program. Approval of the program director is required prior to enrolling in the course and requires a learning contract.