RADIATION THERAPY, BS

The **Bachelor of Science in Radiation Therapy** is a 122 semester-hour program offered in-person within the College of Medicine and Life Sciences. The program is designed to provide students with the knowledge and skills required to be a certified radiation therapist. Two years of pre-specialization coursework is offered on Main Campus. An additional two years of professional training includes coursework offered on Health Science Campus, practical laboratories and exercises offered in the Department of Radiation Oncology where the program is housed and radiation therapy equipment is located, and practical training in local radiation therapy clinics. Students complete pre-specialization coursework in general education, foundational courses in health sciences, anatomy and physiology with lab, human pathophysiology for healthcare, medical terminology, and an advanced course in medical ethics.

The degree also includes an introductory course in radiation therapy; advanced coursework in radiation therapy physics, anatomy, patient care management, quality assurance, and radiation biology; courses with labs such as principles and practice of radiation therapy, imaging and processing, and dosimetry; a series of practicums in clinical facilities; and a culminating senior seminar.

An initial program enrollment of 35 full-time equivalent (FTE) students is anticipated for the degree program, with growth to 70 FTE students after four years.

Code	Title	Hours
ENGL 1110	College Composition I	3
HEAL 1800	Medical Terminology	3
MATH 1320	College Algebra	3
PSY 1010	Principles Of Psychology	3
ENGL 2950	Technical Writing	3
EXSC 2560	Anatomy and Physiology I	3
EXSC 2460	Human Anatomy And Physiology I Lab	1
PHIL 1020	Critical Thinking	3
COMM 2840	Interpersonal Communication	3
EXSC 2570	Human Anatomy and Physiol II	3
EXSC 2470	Human Anatomy And Physiology II Lab	1
HEAL 3800	Death And Dying	3
MATH 2600	Introduction To Statistics	3
PHIL 3370	Medical Ethics	3
RDON 1010	Introduction to Radiation Therapy	3
PHIL 3370	Medical Ethics	3
EXSC 2580	Human Pathophysiology For Health Care	3
PHYS 1750	Introduction To Physics	4
RDON 3130	Principles & Practice of Radiation Therapy I	3
RDON 3100	Radiation Therapy Physics I	3
RDON 3110	Sectional Anatomy	3
RDON 3120	Patient Care Management	3
RDON 3140	Imaging and Processing in Radiation Oncology	3
RDON 3150	Radiation Therapy Practices Lab	1
RDON 3210	Introduction to Clinical Practicum	5
RDON 3200	Radiation Therapy Physics II	3
RDON 3230	Principles & Practice of Radiation Therapy II	3
RDON 3240	Principles & Practices of Radiation Therapy II Lab	1
RDON 3300	Clinical Practicum I	7
RDON 4160	Radiation Biology for Radiation Therapy	3
RDON 4110	Dosimetry	3
RDON 4120	Dosimetry Lab	1
RDON 4130	Clinical Practicum II	6
RDON 4200	Quality Assurance & Operational Issues	3
RDON 4210	Senior Seminar in Radiation Therapy	3
RDON 4220	Clinical Practicum III	6

First Term		Hours
ENGL 1110	College Composition I	3
MATH 1320	College Algebra	3
EXSC 2560	Anatomy and Physiology I	3
EXSC 2460	Human Anatomy And Physiology I Lab	1
PSY 1010	Principles Of Psychology (Social Science Core)	3
Elective		3
	Hours	**16**
Second Term		
ENGL 2950	Technical Writing	3
EXSC 2570	Human Anatomy and Physiol II (Natural Science Core)	3
EXSC 2470	Human Anatomy And Physiology II Lab (Natural Science Core)	1
PHIL 1020	Critical Thinking (Arts and Humanities Core)	3
COMM 2840	Interpersonal Communication (Arts and Humanities Core)	3
Elective		2
	Hours	**15**
Third Term		
EXSC 2580	Human Pathophysiology For Health Care	3
PHYS 1750	Introduction To Physics (Natural Science Core)	4
HEAL 3800	Death And Dying	3
U.S. Diversity		3
SOC 1010	Introduction To Sociology (Social Sciences Core)	3
	Hours	**16**
Fourth Term		
RDON 1010	Introduction to Radiation Therapy	3
HEAL 1800	Medical Terminology	3
MATH 2600	Introduction To Statistics	3
PHIL 3370	Medical Ethics	3
Non-U.S. Diversity		3
	Hours	**15**
Fifth Term		
RDON 3100	Radiation Therapy Physics I	3

RDON 3110	Sectional Anatomy	3
RDON 3120	Patient Care Management	3
RDON 3130	Principles & Practice of Radiation Therapy I	3
RDON 3140	Imaging and Processing in Radiation Oncology	3
RDON 3150	Radiation Therapy Practices Lab	1
	Hours	**16**
Sixth Term		
RDON 3200	Radiation Therapy Physics II	3
RDON 3210	Introduction to Clinical Practicum	5
RDON 3230	Principles & Practice of Radiation Therapy II	3
RDON 3240	Principles & Practices of Radiation Therapy II Lab	1
	Hours	**12**
Seventh Term		
RDON 3300	Clinical Practicum I	7
	Hours	**7**
Eighth Term		
RDON 4160	Radiation Biology for Radiation Therapy	3
RDON 4110	Dosimetry	3
RDON 4120	Dosimetry Lab	1
RDON 4130	Clinical Practicum II	6
	Hours	**13**
Ninth Term		
RDON 4200	Quality Assurance & Operational Issues	3
RDON 4210	Senior Seminar in Radiation Therapy	3
RDON 4220	Clinical Practicum III	6
	Hours	**12**
	Total Hours	**122**

- • Students will prepare and present case studies.
- • Student will exhibit proficient written communication skills.
- • Students will utilize critical thinking to solve a given problem.
- • Students will demonstrate the ability to recognize correct treatment field positioning.
- • Students will display professional behavior in the clinic setting.
- • Students will develop a professional career plan.
- • Students will demonstrate patient safety skills in the clinic.
- • Students will effectively utilize radiation safety practices.

RDON 1010 Introduction to Radiation Therapy
[3 credit hours]
The course provides an overview of the basics of radiation therapy and the practitioner's role in health care delivery. Principles, practices and policies of health care organizations will be discussed, as well as safety concerns and the professional responsibilities of the radiation therapist. Operational human resource concepts, billing and reimbursement issues are introduced. Additionally, the course also describes the inter-relatedness of standards of care, laws, ethical standards and professional competence.
Term Offered: Spring, Summer

RDON 3100 Radiation Therapy Physics I
[3 credit hours]
Radiation Physics I content establishes a basic knowledge of physics as it applies to the radiation oncology clinical setting. Fundamental physical units and measurements, basic principles, atomic structure and types of radiation are discussed. Also presented are the fundamentals of x-ray generating equipment, x-ray production and x-ray interactions with matter. (The course description and Student Learning Outcomes are from the ASRT 2019 Radiation Therapy Professional Curriculum—Radiation Physics section)
Prerequisites: RDON 1010 with a minimum grade of B
Term Offered: Spring, Fall

RDON 3110 Sectional Anatomy
[3 credit hours]
The Sectional Anatomy course introduces students to medical imaging methods currently used in the field of radiation therapy. Students will identify normal anatomical structures via a variety of imaging formats. Basic anatomical relationships will be compared using topographical and cross-sectional images. (The course description and Student Learning Outcomes are derived from the ASRT 2019 Radiation Therapy Professional Curriculum—Sectional Anatomy)
Prerequisites: RDON 1010 with a minimum grade of B
Term Offered: Fall

RDON 3120 Patient Care Management
[3 credit hours]
This course provides radiation therapy students the foundational concepts in the evaluation process of patients during the course of radiation therapy treatment delivery. Both the physical and psychological needs of patients will be explored. The course will address both routine and emergency care procedures.
Prerequisites: RDON 1010 with a minimum grade of B
Term Offered: Spring, Fall

RDON 3130 Principles & Practice of Radiation Therapy I
[3 credit hours]
This course provides an overview of cancer and the specialty of radiation therapy. Historic and current aspects of cancer treatment are covered, along with the roles and responsibilities of the radiation therapist. In addition, treatment prescription, techniques and delivery are discussed. Examines the management of neoplastic disease to include respiratory, central nervous, endocrine, lymphoreticular, hematopoietic, musculoskeletal, benign conditions and HIV related neoplasms. The epidemiology, etiology, detection, diagnosis, treatment and prognosis of neoplastic disease are evaluated in relation to histology, anatomical site and patterns of spread. Examine the role of Radiation Therapy in palliative care. The radiation therapist's responsibility in the management of neoplastic disease will be examined and linked to specific professional skills within their scope.
Prerequisites: RDON 1010 with a minimum grade of B
Term Offered: Fall

RDON 3140 Imaging and Processing in Radiation Oncology
[3 credit hours]
This course covers the factors that affect production and recording of radiographic images for patient simulation, treatment planning and treatment verification, with an emphasis on radiation oncology imaging equipment and related devices. (Course Information derived from the ASRT Radiation Therapy Professional Curriculum 2019)
Prerequisites: RDON 1010 with a minimum grade of B
Term Offered: Fall

RDON 3150 Imaging and Processing Lab
[1 credit hour]
This course is the lab component to accompany RDON 3110 Imaging & Processing, RDON 3120 Patient Care Management, RDON 3130 Principles & Practice of Radiation Therapy I and RDT 3140 Sectional Anatomy. The course provides students the opportunity to demonstrate radiation safety practices, leveling skills, patient transfers, taking vital signs, patient communication/education and assisting with patient personal care. Additionally, students will identify anatomy on images and evaluate images.
Prerequisites: RDON 1010 with a minimum grade of B
Corequisites: RDON 3140
Term Offered: Fall

RDON 3200 Radiation Therapy Physics II
[3 credit hours]
The Radiation Therapy Physics II course reviews and expands basic physics concepts and theories to include content specific to radiation therapy. Detailed analysis of the structure of matter, properties of radiation, nuclear transformations, x-ray production and interactions of ionizing radiation are included. Also presented are treatment units used in external radiation therapy, quality evaluation of ionizing radiation, absorbed dose measurement, dose distribution and scatter analysis. Radiation protection is also covered in this course. The content presents the basic principles of radiation protection and safety for the radiation therapist. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies and health care organizations are included, as well as the specific responsibilities of radiation therapists. (The course description and Student Learning Outcomes are derived from the ASRT 2019 Radiation Therapy Professional Curriculum—Radiation Therapy Physics and Radiation Protection sections)
Prerequisites: RDON 3100 with a minimum grade of B-
Term Offered: Spring

RDON 3210 Introduction to Clinical Practicum
[5 credit hours]
This course is the first in a series of clinical practice courses. The clinical practicum courses are designed to provide sequential development of patient care and procedural information specific to radiation therapy. Through structured sequential assignments in clinical facilities, radiation therapy students are introduced to team practice, patient-centered clinical practice and professional development.
Prerequisites: RDON 3120 with a minimum grade of B-
Term Offered: Spring

RDON 3230 Principles & Practice of Radiation Therapy II
[3 credit hours]
This course is a continuation of RDON 3130 Principles & Practice I. It provides an overview of cancer and the specialty of radiation therapy. Historic and current aspects of cancer treatment are covered, along with the roles and responsibilities of the radiation therapist. In addition, treatment prescription, techniques and delivery are discussed. Examines the management of neoplastic disease to include Genitourinary, Reproductive, Gastrointestinal, Head & Neck, Breast, and Pediatric neoplasms. The epidemiology, etiology, detection, diagnosis, treatment and prognosis of neoplastic disease are evaluated in relation to histology, anatomical site and patterns of spread. The radiation therapist's responsibility in the management of neoplastic disease will be examined and linked to specific professional skills within their scope. (Course description based on the ASRT Radiation Therapy Professional Curriculum 2019 Principles & Practice of Radiation therapy I & II)
Prerequisites: RDON 3130 with a minimum grade of B-
Term Offered: Spring

RDON 3240 Principles & Practices of Radiation Therapy II Lab
[1 credit hour]
This course is the lab component to accompany RDON 3230 Principles & Practice of Radiation Therapy II. The course provides students the opportunity to demonstrate radiation safety practices, leveling skills, patient transfers, patient communication/education. Students will identify anatomy on image and evaluate images. Additionally, students will develop a simulation plan. (Course Student Learning Outcomes derived from the ASRT Radiation Therapy 2019 Professional Curriculum).
Corequisites: RDON 3230
Term Offered: Spring

RDON 3300 Clinical Practicum I
[7 credit hours]
This course is the first in a series of clinical practice courses. The clinical practicum courses are designed to provide sequential development of patient care and procedural information specific to radiation therapy. Through structured sequential assignments in clinical facilities, radiation therapy students are introduced to team practice, patient-centered clinical practice and professional development.
Prerequisites: RDON 3210 with a minimum grade of B-
Term Offered: Summer

RDON 4110 Dosimetry
[3 credit hours]
The Dosimetry course content explains factors that influence clinical planning of patient treatment. This includes isodose descriptions, patient contouring, radiobiologic considerations, dosimetric calculations, compensation and clinical application of treatment beams. Optimal treatment planning is emphasized, and particle beams, stereotactic and emerging technologies are presented.
Prerequisites: RDON 3200 with a minimum grade of B-
Term Offered: Fall

RDON 4120 Dosimetry Lab
[1 credit hour]
This lab course should be taken in parallel to RDON 4110 – Dosimetry. In this lab we will learn the basics of treatment planning, from contouring to calculating isodose distributions. The Dosimetry Lab course content consists of hands-on practical exercises in the use of a commercial treatment planning system to design a treatment plan for a patient. Exercises will include the basic use of treatment planning systems, contouring and elements of plan design. (Course elements derived from the ASRT 2019 Professional Curriculum—Treatment Planning).
Corequisites: RDON 4110
Term Offered: Fall

RDON 4130 Clinical Practicum II
[6 credit hours]
This course is the second in a series of clinical practice courses. The clinical practicum courses are designed to provide sequential development of patient care and procedural information specific to radiation therapy. Through structured sequential assignments in clinical facilities, radiation therapy students are introduced to team practice, patient-centered clinical practice and professional development.
Prerequisites: RDON 3300 with a minimum grade of B-
Term Offered: Fall

RDON 4160 Radiation Biology for Radiation Therapy
[3 credit hours]
A series of introductory lectures on radiation biology with emphasis on the effects of radiation on cells and cellular components, tissues, and organisms. Dose-response relationships, dose-effect modifiers, and considerations applicable to radiation therapy treatments are among covered topics.
Prerequisites: RDON 3230 with a minimum grade of B-
Term Offered: Spring

RDON 4200 Quality Assurance & Operational Issues
[3 credit hours]
Quality management, quality assurance, safety and operations content describe the development of a culture of safety through quality control and assurance checks. This process includes the clinical aspects of patient care, medical records, treatment delivery, localization equipment and treatment planning equipment. The role of the various radiation therapy team members in quality management will be discussed as well as the legal and regulatory implications for maintaining optimal patient care. Accreditation agencies and the radiation therapist's role in the accreditation process will also be covered.
Prerequisites: RDON 4110 with a minimum grade of B-
Term Offered: Spring

RDON 4210 Senior Seminar in Radiation Therapy
[3 credit hours]
This is the didactic capstone course for the program. This purpose of this course is to provide students the opportunity to express their knowledge of the principles of radiation therapy. The student will review radiation therapy cases and present the information in research papers and presentations. The second focus of the course is to prepare the student to demonstrate their cumulative knowledge of the program material.
Prerequisites: RDON 4110 with a minimum grade of B-
Term Offered: Spring

RDON 4220 Clinical Practicum III
[6 credit hours]
This course is the third and final in a series of clinical practice courses. The clinical practicum courses are designed to provide sequential development of patient care and procedural information specific to radiation therapy. Through structured sequential assignments in clinical facilities, radiation therapy students are introduced to team practice, patient-centered clinical practice and professional development.
Prerequisites: RDON 4130 with a minimum grade of B-
Term Offered: Spring