RADIOLOGIC AND IMAGING SCIENCE (RIS)

RIS 34001 INTRODUCTION TO DIAGNOSTIC MEDICAL SONOGRAPHY
1 Credit Hour
Provides an introduction to diagnostic medical sonography. The course orients new students to the profession. Topics covered include basic sonographic principles, scanning technique, and introduction patient management techniques.
Prerequisite: Special approval.
Schedule Type: Lecture
Contact Hours: 1 lecture
Grade Mode: Standard Letter

RIS 34003 RADIATION THERAPY PRINCIPLES AND PRACTICE I 3 Credit Hours
An overview of cancer, radiation therapy and its physical and technical aspects. Includes the roles/responsibilities of the therapist, treatment parameters, documentation and delivery of patient care, education and procedures.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34030.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter-IP

RIS 34004 RADIATION THERAPY PATIENT MANAGEMENT 3 Credit Hours
Provides the basic concepts in patient assessment and evaluation. Includes communication skills, infection control, nutrition, medications, exams, emergencies, patient transfer techniques, medical ethics and law as applied to radiation therapy.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34045.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter-IP

RIS 34008 RADIATION THERAPY PHYSICS I 3 Credit Hours
Introduction to radiation therapy physics, including the fundamentals of atomic structure, radiation properties, radiation production, radiation quality, interactions of radiation with matter and principles of radiation detectors.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34030.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

RIS 34030 RADIATION THERAPY CLINICAL EDUCATION I 1 Credit Hour
Observation and supervised clinical education with emphasis on administering radiation therapy treatments and patient care.
Prerequisite: Radiologic and imaging sciences major; and special approval.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 2.5 lab, 5 other
Grade Mode: Standard Letter-IP

RIS 34040 PATIENT MANAGEMENT IN DIAGNOSTIC MEDICAL SONOGRAPHY 3 Credit Hours
Methods of patient management in diagnostic medical sonography are examined with emphasis on patient communication, clinical assessment, medical legal aspects, medical records, emergencies, pharmacology, safety issues, ethics and critical thinking.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34045.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

RIS 34042 ABDOMINAL SONOGRAPHY I 3 Credit Hours
Anatomy, physiology and pathology of the abdomen; instrumentation and scanning techniques; normal and abnormal sonographic appearances of abdominal structures will be presented.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34045.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

RIS 34044 ULTRASOUND PHYSICS AND INSTRUMENTATION 3 Credit Hours
Ultrasound principles to include interaction of sound with matter, propagation of sound in tissue, physical units, transducer parameters, image storage and display, quality assurance, bioeffects, image artifacts and physical principles of doppler.
Prerequisite: Radiologic and imaging sciences major.
Corequisite: RIS 34045.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

RIS 34045 ULTRASOUND CLINICAL EDUCATION I 2 Credit Hours
Provides clinical education and experience at a lab and clinical site to allow students the opportunity to practice skills necessary to obtain high quality sonographic images, to alter protocols on patients and to identify image quality problems. Content includes sonography of the liver, gallbladder, pancreas and spleen.
Prerequisite: Radiologic and imaging sciences major; and special approval.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 3 lab, 1 other
Grade Mode: Standard Letter-IP

RIS 34052 ABDOMINAL SONOGRAPHY II 3 Credit Hours
Continuation of RIS 34042: anatomy, physiology and pathology of the abdomen; instrumentation and sonographic scanning techniques; normal and abnormal sonographic appearance of abdominal structures will be presented.
Prerequisite: RIS 34042; and radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter
RIS 34060  ULTRASOUND CLINICAL EDUCATION II  4 Credit Hours
Provides clinical education and experience at a clinical site to allow
students the opportunity to practice skills necessary to obtain high
quality sonographic images, to alter protocols based on patients and
to evaluate image quality problems. Content includes sonography of
the abdominal vessels, kidneys, adrenal glands, lymphatics and gynecologic
pelvis.
Prerequisite: RIS 34045.
Corequisite: RIS 34052.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 3 lab, 5 other
Grade Mode: Standard Letter-IP
RIS 34052  OBSTETRICS AND GYNECOLOGY SONOGRAPHY I  3
Credit Hours
Anatomy and pathophysiology of the non-pregnant female pelvis;
instrumentation and scanning techniques; normal and abnormal
sonographic appearances; and findings of the female reproductive tract
are covered.
Prerequisite: RIS 34045; and radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter
RIS 34072  SUPERFICIAL STRUCTURES SONOGRAPHY  2 Credit
Hours
Anatomy and pathophysiology of superficial structures; instruction
and scanning techniques; normal and abnormal sonographic
appearances of superficial structures; correlation with laboratory findings
and other imaging modalities are presented. Introductory pediatric
sonographic techniques and pathology are presented.
Prerequisite: RIS 34083.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
RIS 34075  ULTRASOUND CLINICAL EDUCATION III  2 Credit Hours
Provides clinical education and experience at clinical sites to allow
students the opportunity to practice skills necessary to obtain high
quality sonographic images, to alter protocols based on patients and
to evaluate image quality. Content includes first, second and third trimester
obstetric sonography and superficial structures sonography.
Prerequisite: RIS 34062.
Corequisite: RIS 44072.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 2 lab, 12 other
Grade Mode: Standard Letter-IP
RIS 34083  SECTIONAL ANATOMY IN MEDICAL IMAGING  3 Credit
Hours
Presentation of sectional anatomy of the body in the transverse (axial),
sagittal and coronal planes as seen in medical images in CT, MRI and
diagnostic medical sonography.
Prerequisite: BSCI 11010 and BSCI 11020; or BSCI 21010 and
BSCI 21020; and radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter
RIS 34084  COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE
IMAGING SECTIONAL ANATOMY I  2 Credit Hours
Presentation of sectional anatomy of the human body in computed
tomography and magnetic resonance imaging. Includes orientation of
organs and structures and pathological processes present in images.
Prerequisite: Radiologic and imaging sciences major; and special
approval.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
RIS 34086  COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE
IMAGING SECTIONAL ANATOMY II  2 Credit Hours
Presentation of sectional anatomy of the human body in computed
tomography and magnetic resonance imaging. Includes orientation of
organs and structures and pathological processes present in images as
seen in the extremities.
Prerequisite: RIS 34084; and radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
RIS 41095  SPECIAL TOPICS IN RADIOLOGIC AND IMAGING SCIENCES
1-3 Credit Hours
(Repeatable for credit) Courses will consist of various topics in medical
imaging designed to enhance learning outcomes.
Prerequisite: Radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 1-3 lecture
Grade Mode: Standard Letter-IP
RIS 44000  INTRODUCTION TO RADIATION THERAPY  2 Credit Hours
An introduction to patient care techniques and clinical procedures for
freshman entry students admitted to the RIS major in radiation therapy.
Prerequisite: Radiologic and imaging sciences major.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
RIS 44003  MAGNETIC RESONANCE IMAGING CLINICAL EDUCATION I
2 Credit Hours
Students observe and become acquainted with MRI equipment and
procedures at the clinical education setting and apply knowledge of
physics, MRI safety and patient care. Students begin to perform some
procedures under direct supervision of MRI technologists. Students
attend clinicals 15 hours per week.
Prerequisite: Radiologic and imaging sciences major; and special
approval.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 5 lab, 10 other
Grade Mode: Standard Letter-IP
RIS 44004  COMPUTED TOMOGRAPHY CLINICAL EDUCATION I  2
Credit Hours
Provides clinical education and experience at a clinical setting to allow
the student the opportunity to become proficient in skills necessary to
obtain quality images, to alter protocols based on patient pathology or
physical condition, and to identify image quality problems and to make
appropriate corrections under direct supervision of a CT Technologist.
Prerequisite: Radiologic and imaging sciences major; and special
approval.
Schedule Type: Clinical Laboratory, Laboratory
Contact Hours: 5 lab, 10 other
Grade Mode: Standard Letter-IP
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Exams. Information includes effective communication, problem-solving techniques, patient safety/comfort, patient preparation, monitoring, contrast agents and venipuncture.

Prerequisite: Radiologic and imaging sciences major.

Continuation of the principles of radiation therapy physics and the study of photon beam dosimetry, electron beam dosimetry and treatment planning.

Prerequisite: RIS 34008.

Provides knowledge about care-giving skills for patients undergoing CT exams. Information includes effective communication, problem-solving techniques, patient safety/comfort, patient preparation, monitoring, contrast agents and venipuncture.

Prerequisite: Radiologic and imaging sciences major.

Establishes a foundation in radiation biology for radiation therapy. Cell biology and its response to radiation are reviewed as well as the effect of radiation on pathology and body systems.

Prerequisite: RIS 44018.

Continuation of Radiation Therapy Pathology I to include epidemiology, etiology, symptoms, metastases, histology, tumor grading, staging, detection, screening and diagnosis, treatment, side effects and prognosis of malignancies of the male reproductive, urinary, endocrine, circulatory, lymphatic, integumentary and musculoskeletal systems as well as pediatric solid malignancies.

Prerequisite: RIS 34083 and RIS 44029.

Review and testing of major subject areas from all radiation therapy courses to prepare students to successfully pass the national certification exam based on the content specifications from the American Registry of Radiologic Technologists (ARRT).

Prerequisite: RIS 44009 and RIS 44018 and RIS 44028 and RIS 44042.

Provides information on the role of the MRI technologist in maintaining patient safety and comfort as well as personal and co-worker safety. MR contrast agents and venipuncture will be studied. Includes problem solving with diverse patient types.

Prerequisite: Radiologic and imaging sciences major.

Provides overview of quality management programs and continuing quality improvement in radiation therapy. Topics include validity of quality assurance checks, chart checks, image checks, testing on simulators, linear accelerators and brachytherapy sources.

Prerequisite: RIS 44018.

Continuation of the principles of radiation therapy physics and the study of photon beam dosimetry, electron beam dosimetry and treatment planning.

Prerequisite: Radiologic and imaging sciences major.

Continuation of Radiation Therapy Pathology I to include epidemiology, etiology, symptoms, metastases, histology, tumor grading, staging, detection, screening and diagnosis, treatment, side effects and prognosis of malignancies of the male reproductive, urinary, endocrine, circulatory, lymphatic, integumentary and musculoskeletal systems as well as pediatric solid malignancies.

Prerequisite: Radiologic and imaging sciences major.

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Prerequisite: Radiologic and imaging sciences major.

Provides overview of quality management programs and continuing quality improvement in radiation therapy. Topics include validity of quality assurance checks, chart checks, image checks, testing on simulators, linear accelerators and brachytherapy sources.

Prerequisite: Radiologic and imaging sciences major.
RIS 44044  MAGNETIC RESONANCE IMAGING PROCEDURES I  2 Credit Hours
Provides the imaging techniques related to the body, special clinical applications, coil selection, scan sequences, protocols, positioning criteria, normal and abnormal anatomical and pathologic structures and signal characteristics for all areas of the body except extremities and vascular areas.
Prerequisite: Radiologic and imaging science major.
Corequisite: RIS 44003.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

RIS 44045  MAGNETIC RESONANCE IMAGING PROCEDURES II  2 Credit Hours
Provides the imaging techniques related to the body, special clinical applications, coil selection, scan sequences, protocols, positioning criteria, normal and abnormal anatomical and pathologic structures and signal characteristics for the extremities and vascular areas.
Prerequisite: RIS 44044; and radiologic and imaging science major.
Corequisite: RIS 44063.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

RIS 44047  COMPUTED TOMOGRAPHY PROCEDURES I  2 Credit Hours
Introduction to CT procedures with scanning protocols, positioning and non-contrast anatomy.
Prerequisite: Radiologic and imaging science major.
Corequisite: RIS 44004.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

RIS 44048  COMPUTED TOMOGRAPHY PROCEDURES II  2 Credit Hours
Overview of the procedures presented in CT Procedures I course, anatomy as seen on scans both with and without contrast media, advanced processing, and advanced imaging procedures.
Prerequisite: RIS 44047.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

RIS 44051  MAGNETIC RESONANCE EQUIPMENT AND IMAGE ACQUISITION I  2 Credit Hours
Develops an understanding of MR image acquisition and the hardware used. Provides information in the use and manipulation of the instrumentation and technical parameters used in the generation of images. Enables the student to maximize MR image quality.
Prerequisite: RIS 44051; and radiologic and imaging science major.
Corequisite: RIS 44063.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
RIS 44063 MAGNETIC RESONANCE IMAGING CLINICAL EDUCATION II  
2 Credit Hours 
Continuation of MRI Clinical Education I. Students apply knowledge of patient care, anatomy and pathology, equipment and image acquisition when observing and performing MRI procedures clinically. Students attend the clinical education setting for 15 hours per week.  
Prerequisite: RIS 44063.  
Schedule Type: Clinical Laboratory, Laboratory  
Contact Hours: 5 lab, 10 other  
Grade Mode: Standard Letter-IP  

RIS 44066 MAGNETIC RESONANCE IMAGING TECHNIQUES  
2 Credit Hours 
Integrates concepts of MRI including patient care, imaging procedures, data acquisition and processing as well as principles of image formation for review for the national certification exam in magnetic resonance imaging.  
Prerequisite: RIS 44063; and special approval.  
Schedule Type: Lecture  
Contact Hours: 2 lecture  
Grade Mode: Standard Letter  

RIS 44067 RADIATION THERAPY CLINICAL EDUCATION IV  
3 Credit Hours 
Continuation of Clinical Education III with added emphasis on critical thinking, problem solving and clinical competency.  
Prerequisite: RIS 44058.  
Schedule Type: Clinical Laboratory, Laboratory  
Contact Hours: 2 lecture, 7.5 lab, 15 other  
Grade Mode: Standard Letter-IP  

RIS 44068 COMPUTED TOMOGRAPHY TECHNIQUES  
2 Credit Hours 
Students will review knowledge in each content area of the national certification exam in CT including patient management, imaging procedures, and physics and instrumentation.  
Prerequisite: RIS 44054; and special approval.  
Schedule Type: Lecture  
Contact Hours: 2 lecture  
Grade Mode: Standard Letter  

RIS 44069 COMPUTED TOMOGRAPHY CLINICAL EDUCATION III  
1 Credit Hour 
Allows students to advance clinical education skills and experiences at a clinical setting in order to obtain quality images, objectively alter protocols based on patient pathology or physical condition, and to identify image quality problems and to make appropriate corrections under the direct supervision of a CT Technologist. Student will attend a clinical education site for 10 days during the semester.  
Prerequisite: RIS 44054.  
Schedule Type: Clinical Laboratory, Laboratory  
Contact Hours: 2.5 lab, 5 other  
Grade Mode: Standard Letter-IP  

RIS 44072 OBSTETRICS AND GYNECOLOGY SONOGRAPHY II  
3 Credit Hours 
Embryonic and fetal development throughout gestation; fetal measurements, normal fetal anatomy and physiology; and abnormal sonographic appearances of the fetus will be covered as well as invasive obstetric procedures and antepartum testing.  
Prerequisite: RIS 34062.  
Schedule Type: Lecture  
Contact Hours: 3 lecture  
Grade Mode: Standard Letter  

RIS 44073 MAGNETIC RESONANCE IMAGING CLINICAL EDUCATION III  
1 Credit Hour 
Continuation of Clinical Education II with student advancing skills and proficiency in performing MRI procedures in the clinical setting and are able to solve problems in a more independent manner. Students will complete 10 clinical days throughout the term.  
Prerequisite: RIS 44063.  
Schedule Type: Clinical Laboratory, Laboratory  
Contact Hours: 2.5 lab, 5 other  
Grade Mode: Standard Letter-IP  

RIS 44074 VASCULAR SONOGRAPHY  
2 Credit Hours 
Anatomy, physiology and hemodynamics of the cerebrovascular, abdominal and peripheral vascular systems; normal and abnormal sonographic vascular appearances; Doppler instrumentation and scanning techniques are covered.  
Prerequisite: Radiologic and imaging science major.  
Schedule Type: Lecture  
Contact Hours: 2 lecture  
Grade Mode: Standard Letter  

RIS 44076 ULTRASOUND CLINICAL EDUCATION IV  
4 Credit Hours 
Provides clinical education and experience at a clinical site to allow students the opportunity to practice skills necessary to obtain high quality sonographic images, to alter protocols based on patients and to identify image quality problems. Content includes abdominal, pelvic, obstetrical, superficial structure and vascular sonography.  
Prerequisite: RIS 34075.  
Corequisite: RIS 44074.  
Schedule Type: Clinical Laboratory, Laboratory  
Contact Hours: 4 lab, 24 other  
Grade Mode: Standard Letter-IP  

RIS 44078 SONOGRAPHIC TECHNIQUES  
3 Credit Hours 
Course integrates diagnostic medical sonography concepts in preparation for certification exams.  
Prerequisite: RIS 34044 and 34052 and 44072.  
Schedule Type: Lecture  
Contact Hours: 3 lecture  
Grade Mode: Standard Letter  

RIS 44083 PATHOPHYSIOLOGY FOR MEDICAL IMAGING  
3 Credit Hours 
Provides students with basic information on the causes of disease and the body’s response to disease, as well as the imaging modalities that will demonstrate them.  
Prerequisite: RIS 34045 or RIS 44003 or RIS 44004; and radiologic and imaging science major.  
Schedule Type: Lecture  
Contact Hours: 3 lecture  
Grade Mode: Standard Letter  

RIS 44084 ULTRASOUND IMAGE EVALUATION  
1 Credit Hour 
Presentation of sonographic findings in specific disease processes, with evaluation of image quality and emphasis on diagnostic features of pathologic entities.  
Prerequisite: Radiologic and imaging science major.  
Schedule Type: Lecture  
Contact Hours: 1 lecture  
Grade Mode: Standard Letter
RIS 44088  LEADERSHIP IN MEDICAL IMAGING  1 Credit Hour
An introduction to the key strategies needed for success in health care leadership positions for both new and seasoned professionals. Includes supervision skills, competent communication, employment law, performance coaching, quality standards, accreditation and regulations, budgeting and finance, project management, leadership skills and health economics.
Prerequisite: Special approval.
Schedule Type: Lecture
Contact Hours: 1 lecture
Grade Mode: Standard Letter

RIS 44096  INDIVIDUAL INVESTIGATION IN MEDICAL IMAGING
DIRECTED READINGS  3 Credit Hours
(Repeatable for credit) Students are assigned prescribed number of medical imaging journal articles, completes post test and submits a summary paper and online discussions.
Prerequisite: Radiologic and imaging science major; and special approval.
Schedule Type: Individual Investigation
Contact Hours: 3 other
Grade Mode: Standard Letter

RIS 44098  RESEARCH IN MEDICAL IMAGING (ELR) (WIC)  3 Credit Hours
Fundamental concepts and procedures for systematic collection, analysis critique and application of qualitative and quantitative data in medical imaging.
Prerequisite: RIS 34030 or RIS 34045 or RIS 44003 or RIS 44004; and radiologic and imaging science major.
Schedule Type: Research
Contact Hours: 3 other
Grade Mode: Standard Letter
Attributes: Experiential Learning Requirement, Writing Intensive Course