RADIOLOGICAL SCIENCES (RADI)

RADI 5024. Radiation Measurements. 4 Clock Hours.
The physical characteristics of principal types of detection and measurement systems used for charged particle and photon beams. Experimental laboratories involve use of the systems for standardization, calibration and energy analysis. Laboratory included.
Course Type: Lecture

RADI 5102. Radiation Protection and Shielding in Medical Installations. 2 Clock Hours.
Prerequisites: Enrolled in Graduate Medical Physics Programs or approval by the course instructor This course will cover radiation protection, dose managements and shielding designs in medical physics: diagnostic radiological imaging, nuclear medicines and radiation therapy.
Course Type: Lecture

RADI 5222. Introduction to Radiation Biology and Chemistry. 2 Clock Hours.
Effects of ionizing radiation on chemical and biological systems. Covers effects on water and biological macromolecules, acute and chronic effects on germ cells, embryo and adult tissues.These data are then used to develop a scientific basis for radiation therapy and the rationale for current radiation protection practices.
Course Type: Lecture

RADI 5303. Clinical and Radiological Anatomy. 3 Clock Hours.
Prerequisites: Graduate student in Radiological Sciences and approval of the instructor. This course presents the development and gross structure of the human body covering all major organ systems. The course forms a basis for understanding the depths of human biology and structure in a detailed manner. Radiology faculty presentations will provide cross sectional anatomy required by medical physics students.
Course Type: Lecture

RADI 5403. Introduction to Clinical Biomedical Informatics for Quantitative Scientists. 3 Clock Hours.
Prerequisites: Undergraduate Biological Courses or Physiology/Anatomy, Chemistry with Laboratory and Permission of Instructor. Clinically-oriented relevant hospital/medical school based including PACS/teleradiology. Informatics involved with patient care of the evaluation/investigation of disease is taught with Systems biology for Quantitative scientists.
Course Type: Lecture

RADI 5413. Introduction to Clinical Biomedical Informatics for Biological Scientists. 3 Clock Hours.
Prerequisites: Chemistry with Laboratory, Biology, and Computer experience: Permission of Instructor. Clinically-oriented relevant hospital/medical school based including PACS/teleradiology. Informatics involved with patient care or the evaluation/investigation of disease is taught with Quantification/Computation Requirements for biologists.
Course Type: Lecture

RADI 5533. Decision Theory In Radiological Sciences. 3 Clock Hours.
May be repeated; maximum credit 3 hours. Signal detection theory, bayesian methodology and information theory, and their applications in the radiological sciences.
Course Type: Lecture

RADI 5543. Pattern Recognition and Image Processing. 3 Clock Hours.
Pattern recognition and image processing techniques and their applications to problems in the radiological sciences. The emphasis is the definition of a background for analyzing images, particularly for diagnostic radiology.
Course Type: Lecture

RADI 5643. Physics of Magnetic Resonance Imaging. 3 Clock Hours.
Prerequisites: Undergraduate Electricity & Magnetism and Differential Equations; or Course Director Approval. Fundamental physics/mathematics for magnetic resonance imaging and magnetic resonance spectroscopy. Includes magnetic resonance phenomenon, T1 and T2 relaxation mechanisms, Bloch equation, pulsing sequences, paramagnetic agents, biological effects of electric and magnetic fields, MR safety and site planning for MR equipment. Applications of this methodology to radiological practice will be presented. (Fall, Spring II)
Course Type: Lecture

RADI 5693. Radiation Onocology. 3 Clock Hours.
Radiobiological basis of radiotherapy, modifiers of radiation response, common techniques of irradiation, combined therapy, clinical considerations in treatment of malignant neoplasm's, basic anatomy and pathology.
Course Type: Lecture

RADI 5783. Diagnostic Radiology I. 3 Clock Hours.
Diagnostic x-ray methods, including imaging methods, contrast media, tomography, special procedures, neuroradiology, normal and abnormal roentgen anatomy.
Course Type: Lecture

RADI 5824. Production and Absorption of Ionizing Radiation. 4 Clock Hours.
Radiation shielding, x-ray generators, accelerators, charged particle attenuation in matter, ionization, excitation, scattering and radiative processes. Radiation dosimetry and calibration of photon and electron beams.
Course Type: Lecture

RADI 5971. Seminar in Radiological Sciences. 1 Clock Hour.
Prerequisites: Permission. May be repeated; maximum credit 4 hours. Departmental colloquium for communication among disciplines on current research and on relevant topics from current literature.
Course Type: Discussion

RADI 5980. Research for Masters Thesis. 1-8 Clock Hours.
Prerequisites: Permission. May be repeated; maximum credit 8 hours. Research Master's Thesis Radiological Sciences.
Course Type: Independent Study

RADI 6311. Clinical Practicum I (Imaging Workflow). 1 Clock Hour.
Prerequisites: None. Experience and training in a medical physics in clinical setting; instrumentation methodology, 3D Workstation Imaging (MR and Ultrasound, for example), neurosurgical stereotactic localization, and quality assurance.
Course Type: Laboratory

RADI 6321. Clinical Practicum II (Radiation Therapy). 1 Clock Hour.
Prerequisites: None. Experience and training in the practice of radiotherapy physics; treatment planning, instrumentation calibration, and quality assurance.
Course Type: Laboratory

RADI 6331. Clinical Practicum III (Diagnostic Physics). 1 Clock Hour.
Prerequisites: None. This is a one-hour practicum aimed at providing students with an opportunity to receive additional training in Radiation Diagnostic Equipment.
Course Type: Laboratory

RADI 6341. Clinical Practicum IV (Nuclear Medicine). 1 Clock Hour.
Prerequisites: None. Introduction to the field of nuclear medicine with emphasis on the principles of radiation safety, health physics, and the various studies performed in a nuclear medicine area.
Course Type: Laboratory

RADI 6623. Principles of Nuclear Medicine. 3 Clock Hours.
The physical and physiological principles underlying the procedures of nuclear medicine. Instrumentation, radiopharmaceuticals, dosimetry, quality assurance, and evaluation of the function procedures.
Course Type: Lecture

RADI 6642. Ultrasound. 2 Clock Hours.
The principles of generating ultrasound, of the interaction of ultrasound or ultrasound with materials (with special emphasis on the tissues of mammals), and the detection techniques and instrumentation.
Course Type: Lecture

RADI 6823. Subatomic Physics for Medical Physicists. 3 Clock Hours.
Prerequisites: RADI 5824 Production and Absorption of Ionizing Radiation Particle therapy, an important modality for treatment of cancer, requires an understanding of subatomic physics. This course will provide clear understandings of the structure of nucleus, nuclear reactions in matter, nuclear forces, fission, fusion, rare decays, quark models, proton, neutron and heavy ion reactions and their applications to medical physics.
Course Type: Lecture

RADI 6864. Radiological Physics I. 4 Clock Hours.
Lecture and laboratory relevant to the physics of radiation therapy with special emphasis on exposure and dose measurements, isodose information, radium applications, and treatment planning techniques. The aim is to enable the student to work effectively with the physician in cancer therapy.
Course Type: Lecture

RADI 6874. Radiological Physics II. 4 Clock Hours.
Lecture and laboratory relevant to the physics of nuclear medicine with special emphasis on dose standardization, MIRD dose systems, information from scans, camera characteristics, and NRC licenses. The aim is to enable the student to work effectively with the physician in nuclear medicine.
Course Type: Lecture

RADI 6884. Radiological Physics III. 4 Clock Hours.
Lecture and laboratory relevant to the physics of diagnostic x-ray and protection with emphasis on diagnostic generator characteristics, quality assurance, modulation transfer function of systems, radiation protection criteria and facility design. Provides the student adequate background to attack problems arising in diagnostic x-ray.
Course Type: Lecture

RADI 6950. Research Methods in Radiological Sciences. 1-8 Clock Hours.
Prerequisites: None. May be repeated with change of subject matter; multiple enrollment in same term, maximum credit 8 hours. Research on a problem in radiological sciences mutually agreed upon by student and instructor.
Course Type: Independent Study

RADI 6960. Directed Reading in Advanced Topics. 1-6 Clock Hours.
Prerequisites: None. May be repeated with change of content; maximum credit 6 hours. Advanced topics in radiological sciences, such as: advanced dosimetry, quantum chemistry, molecular physics, theory of imaging systems, medical physics, advanced radiobiology, physiological kinetics, solid state systems, cell dynamics.
Course Type: Independent Study

RADI 6980. Doctor's Dissertation Research. 1-16 Clock Hours.
May be repeated; maximum credit 16 hours. Doctor's Dissertation Research
Course Type: Independent Study

RADI 6990. Special Studies. 1-8 Clock Hours.
Prerequisites: None. May be repeated with change of subject matter; maximum credit 8 hours. Specialized topics in radiological sciences, such as: thermoluminescent dosimeters, kinetics of cell populations, applications of image theory, pulse radiolysis products.
Course Type: Independent Study

RADI 9101. Radiology Selective. 80 Clock Hours.
Prerequisites: Medical School 3rd year standing. This selective is designed to introduce the student to the basic knowledge used in interpretation of various imaging modalities and appropriate use of imaging for clinical diagnosis. Didactic sessions covering basic principles and concepts will complement the clinical experience.
Course Type: Clinical

RADI 9700. Radiological Elective. 80-160 Clock Hours.
The primary aim of the course is to give the student a foundation in the basics of x-ray interpretation. The student will also be introduced to the indications and applications of the radiological subspecialties, including ultrasound, computerized tomography, magnetic resonance imaging, nuclear medicine, and angiography.
Course Type: Clinical

RADI 9702. Diagnostic Ultrasound Clerkship. 80-160 Clock Hours.
Elective. The clinical application and interpretation of diagnostic ultrasound, with special study projects. The three major hospitals at the Health Sciences Center provide the setting for the student to become familiar with a wide variety of adult and pediatric examinations.
Course Type: Clinical

RADI 9703. Nuclear Medicine. 80-160 Clock Hours.
Elective. The clinical applications and interpretation of nuclear medicine.
Course Type: Clinical

RADI 9707. Mammography. 80-160 Clock Hours.
Elective. Comprehensive exposure to the full range of breast diseases, including instruction and participation in the basic principles of breast cancer detection by physical examination and mammographic techniques, film evaluation, and fundamentals of breast cancer detection in a screening environment.
Course Type: Clinical

RADI 9708. Pediatric Radiology. 160 Clock Hours.
Elective. Active participation in the day to day operation of the radiology service at oklahoma children's memorial hospital.
Course Type: Clinical

RADI 9710. Clinical Magnetic Resonance Imaging. 80-160 Clock Hours.
Learn the clinical applications of this new imaging technology. Observe studies being performed at two busy magnetic resonance imaging centers and attend resident/fellow check sessions. Areas currently evaluated by magnetic resonance imaging include brain and central nervous system, musculoskeletal system, cardiovascular system, abdomen, and pelvis.
Course Type: Clinical

RADI 9713. Diagnostic Radiology-Baptist Medical Center. 160 Clock Hours.
Elective. The student will be assigned to observe staff and resident radiologists, make radiographic interpretations, and observe the performance of various radiographic procedures, including fluoroscopy. Will read x-rays and attend departmental conferences.
Course Type: Clinical

RADI 9740. Radiology Selective. 80-160 Clock Hours.
The primary aim of the course is to give the student a foundation in the basics of x-ray interpretation. The student will also be introduced to the indications and applications of the radiological subspecialties, including ultrasound, computerized tomography, magnetic resonance imaging, nuclear medicine, and angiography.
Course Type: Clinical

RADI 9960. Off-Campus Elective in Radiology. 80-160 Clock Hours.
Prerequisites: Approval of Visiting School and OU Department Course Director. May be repeated; maximum credit 320 hours. An off-campus elective is defined as work not at the Health Sciences Center, College of Medicine-Tulsa, or in a formally affiliated hospital; nor under the direct supervision of a member of the full-time faculty of the College of Medicine. A statement from the course director of the proposed elective concerning the supervision and grading of student's experience and a detailed course description of the proposed elective are required.
Course Type: Clinical

RADI 9970. Off-Campus Elective. 160-320 Clock Hours.
May be repeated; maximum credit 320 hours. Work not at the Health Sciences Center or Tulsa Medical College.
Course Type: Clinical

RADI 9980. Special Studies. 1-640 Clock Hours.
Prerequisites: None. May be repeated with change of subject matter, multiple enrollment in same term, maximum 640 clock hours. Topics of special nature or of unusual interest to the individual student.
Course Type: Clinical

RADI 9990. Special Studies. 1-348 Clock Hours.
May be repeated with change of subject matter. Topics of a special nature or of unusual interest to the individual student.
Course Type: Clinical