

MAGNETIC RESONANCE IMAGING (MRI)

MRI 4300 - MRI Clinical Practicum I

Credit(s): 1 Credit

Students will perform a variety of MRI procedures in multiple clinical settings under the direct supervision of qualified medical professionals. Students will interact with patients ranging from infants to geriatrics and apply the skills necessary for patient and personnel safety. The practicum allows students to practice skills necessary to obtain high quality MR images, to alter protocols objectively based on patient anatomy and pathology or physical condition, and to identify image quality and equipment problems to make appropriate corrections. Clinical experience will include venipuncture and the administration of contrast media. (Offered in Fall) Offered beginning in fall 2022.

Restrictions:

Enrollment is limited to students with a major in Magnetic Resonance Imaging.

MRI 4310 - Physical Principles

Credit(s): 3 Credits

This class will cover the history of magnetic resonance imaging, matter, magnetism, signal production, and the physics related to imaging. This includes MR signal induction, sampling and conversion, along with tissue characterization; T1 and T2 relaxation; signal decay; K-space; Fourier transformation; spatial encoding; and image characteristics. (Offered every Fall)

MRI 4320 - Cross Sectional Anatomy and Pathology

Credit(s): 3 Credits

Students will become familiar with MRI cross-sectional anatomy and will learn how to view and to image the human body in multiple planes. They will learn specific imaging planes and protocols for specific exams as well as contrast usage and recognition. The pathology of the various body regions (including neurological, visceral, musculoskeletal, soft tissue, and vasculature) will be discussed as it relates to MR imaging. (Offered every Fall)

MRI 4330 - Instrumentation and Quality Analysis

Credit(s): 3 Credits

This class covers all components of MR imaging equipment including the main and secondary magnet systems, RF coils, the acquisition console, and all ancillary equipment. The various types of magnets, gradients, and shielding will be covered, as well as maintenance, quality analysis and operational workflows. (Offered every Fall)

MRI 4340 - Clinical MRI and Image Production

Credit(s): 5 Credits

Students will learn the clinical aspects of MRI. This includes the basics of image production and the corresponding pulse sequences. Imaging parameters for intrinsic image contrast characteristics, proper sequence selection, adjustment of imaging options, administration and utility of contrast media, and use of post-processing applications are included. (Offered every Fall)

MRI 4350 - Patient Care and MRI Safety

Credit(s): 3 Credits

This class will cover the handling, care, and safety of patients, visitors, and staff in the MRI environment. This includes the proper education and screening of anyone or any equipment entering the magnetic and RF fields. Patient assessment, communication and care, as well as ethical and legal principles will be included. Emergency procedures and their effect on patients, staff, and the public will also be discussed. (Offered every Fall)

MRI 4410 - Clinical MRI Practicum

Credit(s): 9 Credits

Students will perform a variety of MRI procedures in multiple clinical settings under the direct supervision of qualified medical professionals. Students will interact with patients ranging from infants to geriatrics and apply the skills necessary for patient and personnel safety. The practicum allows students to practice skills necessary to obtain high quality MR images, to alter protocols objectively based on patient anatomy and pathology or physical condition, and to identify image quality and equipment problems to make appropriate corrections. Clinical experience will include venipuncture and the administration of contrast media. Offered every spring through spring 2022.

Prerequisite(s): MRI 4310 with a grade of C or higher; MRI 4320 with a grade of C or higher; MRI 4330 with a grade of C or higher; MRI 4340 with a grade of C or higher; MRI 4350 with a grade of C or higher

MRI 4420 - Advanced and Emerging Technology

Credit(s): 3 Credits

An exploration of the emerging technologies and advances in MRI, including their impact on imaging and healthcare, will be presented. In addition, a correlation between MRI and other imaging modalities (Computed Tomography, Nuclear Medicine/PET, Ultrasound, etc.) will be discussed. This course will include MRI simulation labs and assignments. (Offered every Spring)

MRI 4910 - Clinical Practicum

Credit(s): 0 Credits

This course is a continuation of MRI 4410. Offered every summer through summer 2022.

Restrictions:

Enrollment is limited to students with a major in Magnetic Resonance Imaging.

MRI 4960 - Capstone in MRI

Credit(s): 2 Credits

Students enrolled in this course develop an individual research project for presentation addressing a current or emerging topic in the field of MRI. The project is worked on independently with program faculty mentorship and is required for graduation. (Offered every Spring)

Restrictions:

Enrollment is limited to students with a major in Magnetic Resonance Imaging.

MRI 4980 - Independent Study

Credit(s): 1 or 3 Credits (Repeatable for credit)

Restrictions:

Enrollment is limited to students with a major in Magnetic Resonance Imaging.