MAGNETIC RESONANCE IMAGING (MRI)

**MRI 4310 - Physical Principles**  
Credit(s): 3 Credits  
This class will cover the history of magnetic resonance imaging, magnetism, signal production, and the physics related to imaging. This will include, but is not limited to: tissue characterization; T1 and T2 relaxation; signal decay; K-space; Fourier transformation; spatial encoding; and image characteristics. There are no prerequisite courses.  
(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. The pathology of the various body regions (including neurological, visceral, musculoskeletal, soft tissue, and vasculature) will be discussed as it relates to MR imaging. There are no prerequisite courses.  
(Offered every Fall)

**MRI 4330 - Instrumentation and Quality Analysis**  
Credit(s): 3 Credits  
This class covers all components of MR imaging equipment including the magnet, the acquisition console, and all ancillary equipment. The various types of magnets, gradients, shims, radiofrequency coils, and magnetic and RF shielding will be covered, as well as maintenance, quality analysis and operational workflows. There are no prerequisite courses.  
(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 corresponding pulse sequences (which is expounded upon in the Physical Principles course). Imaging parameters for intrinsic image contrast characteristics; proper sequence selection; adjustment of imaging options; administration of contrast media; and use of post-processing applications are included. There are no prerequisite courses.  
(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 field. Emergency procedures and their effect on patients, staff, and the public will also be discussed. There are no prerequisite courses.  
(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)  
**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.  
(Offered every Spring)

**MRI 4910 - Clinical Practicum**  
Credit(s): 0 Credits  
This course is a continuation of MRI 4410.  
**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 4410 with a grade of C or higher

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

**MRI 4960 - Capstone in MRI**  
Credit(s): 1-3 Credits  
Students enrolled in this course develop an individual research project for presentation. The project is worked on independently with program faculty mentorship and is required for graduation.  
(Offered every Spring)

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