

# MAGNETIC RESONANCE IMAGING (MRI)

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## **MRI 101 MRI Safety, Instrumentation, and Quality Assurance (2 Credits)**

**Corequisites:** MRI 126

30 lecture, 2 total contact hours

In this course, students are introduced to the principles of magnetic resonance imaging (MRI) safety for the patient as well as for occupational and ancillary personnel. The potential hazards and biological effects associated with the MRI environment and MRI procedures will also be discussed. Topics include magnetism, properties of magnetism, magnetic resonance (MR) system components, MR magnets, radio frequency (RF) systems, gradient systems, system shielding, patient screening, contrast agents, and safety zones. In addition, students receive a comprehensive overview of the MRI quality assurance program. Topics include personnel qualifications, the quality control program, safety policies and image quality specific to MRI. The title of this course was previously MRI Safety. This course contains material previously taught in MRI 135. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program.

## **MRI 110 MRI Physics I (3 Credits)**

45 lecture, 3 total contact hours

In this course, students will be introduced to the physical principles of Magnetic Resonance Imaging (MRI), including the basic physics of MRI. Topics include magnetism, MRI signal production, image contrast, spin echo and gradient echo pulse sequences and an introduction to pulse sequence diagrams. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program

## **MRI 120 MRI Procedures I (3 Credits)**

45 lecture, 3 total contact hours

In this course, students learn the Magnetic Resonance Imaging (MRI) scanning procedures for the central nervous and musculoskeletal systems. Topics include scanning pulse sequences, positioning and patient care, sectional anatomy, and pathology. Anatomical structures and the plane that best demonstrates anatomy as well as signal characteristics of normal and abnormal structures will be discussed. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program

## **MRI 126 MRI Clinical Education I (4 Credits)**

**Corequisites:** MRI 101, MRI 110, MRI 120

480 clinical/other, 4 total contact hours

This is the first clinical course for certified radiologic technologists ARRT (R), who are admitted to the Magnetic Resonance Imaging (MRI) program. Students will be introduced to the clinical practice of MRI with emphasis on basic magnetic resonance (MR) scan procedures, MRI safety and patient care. This course requires a 15 week, 32-hours/week clinical rotation under the supervision of a certified MRI technologist. This course was previously MRI 125. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program

## **MRI 130 MRI Physics II (3 Credits)**

45 lecture, 3 total contact hours

In this course, students will learn advanced physical principles of Magnetic Resonance Imaging (MRI). Topics include maximum intensity projection image formation, diffusion and perfusion, fundamentals of flow (including types of flow), flow motion correction and vascular imaging. Students will discuss imaging parameters, imaging options and tradeoff as well as artifacts and compensations. Parallel imaging, MR spectroscopy, and dynamic contrast enhancement will also be covered. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program; MRI 110 minimum grade "C"

## **MRI 140 MRI Procedures II (3 Credits)**

**Corequisites:** MRI 146

45 lecture, 3 total contact hours

In this course, students learn the Magnetic Resonance Imaging (MRI) scanning procedures for the chest, abdomen, pelvis as well as advanced imaging procedures. Magnetic Resonance (MR) topics include scanning pulse sequences, positioning and patient care, sectional anatomy, and pathology. Anatomical structures and the plane that best demonstrates anatomy will be discussed as well as signal characteristics of normal and abnormal structures. Additional topics include breast MRI including dynamic contrast enhanced MR of the breast, cardiac MR including myocardial perfusion and cardiac stress MR, function and functional MR, MR enterography (MRE), colonography, molecular MR imaging and MR elastography. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program; MRI 120 minimum grade "C"

## **MRI 146 MRI Clinical Education II (4 Credits)**

**Corequisites:** MRI 130, MRI 140

480 clinical/other, 4 total contact hours

This is the second clinical course for certified radiologic technologists ARRT(R)(RRT)(CT), who are admitted to the Magnetic Resonance Imaging (MRI) program. Students will observe, assist, and perform basic patient care and MRI clinical procedures under direct and indirect supervision. Students are expected to gain practical experience and demonstrate competency in MR scanning techniques, safety procedures, image evaluation, image post-processing, and patient care. This course requires a 15 week, 32-hours/week clinical rotation under the supervision of an American Registry of Radiologic Technologist (ARRT) MRI registered technologist. This course was previously MRI 145. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Magnetic Resonance Imaging (MRI) program; MRI 126 minimum grade "C"