



#### Course Descriptions

##### ***MR300 - Cross Sectional Anatomy***

***Clock Hours: 64***

This course provides the student with fundamental anatomy and physiology associated with magnetic resonance imaging of the head, neck, face, spine, thorax, abdomen, pelvis, upper and lower extremities. The various structures will be demonstrated in the axial, sagittal and coronal imaging planes.

Pre-requisite: Admission to the program

##### ***MR301 - Procedures I***

***Clock Hours: 64***

Introduces the basic principles of MR safety, covers the basic concepts of patient management, and teaches the education of patients and ancillary staff on magnet safety. Because patient and magnet-related emergencies represent a unique situation to an MRI technologist, recommended procedures and responsibilities of the technologist will be discussed. Other topics that will be introduced include contrast agents used, contraindications, processing of images, routine examinations and protocols utilized, image artifacts, and compensation.

Pre-requisite: Admission to the program

##### ***RT101 - Patient Care in Radiology***

***Clock Hours: 64***

This course provides an overview imaging to the basic concepts of patient care, infection control, and the role of a technologist as a member of the health care team. Content includes pharmacology and administration of diagnostic contrast agents and/or intravenous medications, patient assessment, and vital signs. Topics include: critical thinking, history of imaging, professional roles and behavior, professional attitudes and communications. Also included will be hospital and departmental organization, and hospital and program affiliation.

Pre-requisite: Admission to the program

##### ***MR302 - MRI Scanning Lab I***

***Clock Hours: 32***

Computer simulation software to provide the student with practical scanning practice under the direction of program instructors.

Pre-requisite: Admission to the program

##### ***MR303 - Introductory Clinical Experience I***

***Clock Hours: 112***

Supervised sessions emphasizing development of medical imaging skills. Practical application of MRI imaging with an emphasis on safety, orientation to the equipment, proper scanning positions and planes,

and general patient care. Designed to give the student an introduction to the basics of magnetic resonance imaging in the clinical setting.

Pre-requisite: Admission to the program

**MR304 - Procedures II****Clock Hours: 32**

Expands on the information covered during MRI 301 Procedures I and provides the student with imaging techniques related to the central nervous system CNS, neck, thorax, musculoskeletal MSK system, and abdominopelvic regions. Covers specific clinical application, coils available and their use, considerations in scan sequences, specific choices in protocols (e.g., slice thickness, phase direction, and flow compensation), and positioning criteria. Anatomical structures and the plane that best demonstrates anatomy are discussed as well as signal characteristics of normal and abnormal structures.

Pre-requisite: MR301

**MR305 - Physics I****Clock Hours: 32**

Provides the student with a comprehensive overview of MRI imaging principles to include history, safety, nuclear MR signal production, tissue characteristics, pulse sequences, imaging parameters/options and image formation, image contrast, magnetism, properties of magnetism, MRI system components, MRI magnet (permanent, resistive, superconducting, hybrid), radiofrequency RF pulse systems, gradient systems, shim systems, and shielding.

Pre-requisite: Admission to the program

**MR306 - Intermediate Clinical Experience I****Clock Hours: 448**

Supervised sessions emphasizing development of medical imaging skills. Practical application of MRI imaging with an emphasis on safety, orientation to the equipment, proper scanning positions and planes, and general patient care. Students are required to successfully complete required clinical competency examinations supervised by a registered MRI technologist or clinical preceptor.

Pre-requisite: MR303

**MR307 - Physics II****Clock Hours: 24**

Continues to provide the student with a comprehensive knowledge of MRI imaging principles, knowledge of the parameters and imaging options used to create MRI images and introduces quality control measures used to maintain image quality. Provides a comprehensive overview of the instrumentation associated with MRI pulse sequences to include spin echo, fast spin echo, gradient echo, inversion recovery, echo planar, parallel imaging, and spectroscopy. Other topics include pulse sequencing, imaging parameters/options and image formation, image contrast, contrast agents, advanced imaging, and post processing techniques.



# Cleveland Clinic

## School of Health Professions

Primary Magnetic Resonance Imaging Program

Pre-requisite: MR305

### **MR308 - MRI Pathology**

**Clock Hours: 32**

Introduces concepts related to disease and etiological considerations with an emphasis on their appearance on MRI images using various sequences. The information covered should enhance the students' knowledge regarding interpretation of clinical information provided on the requisition and/or the patient's chart. The course will include a written research paper on a chosen pathology with an oral presentation.

Pre-requisite: MR300

### **ETH101 - Healthcare Ethics and Law**

**Clock Hours: 24**

This course is designed to provide the student with a fundamental background in healthcare ethics and law. The historical and philosophical bases of ethics as well as the elements of ethical behavior are discussed. The student will examine a variety of ethical issues and dilemmas that occur in clinical practice. An introduction to legal terminology, concepts and principles will also be presented. Topics include misconduct, malpractice, unintentional and intentional torts, HIPAA standards and compliance, legal and professional standards and the ASRT scope of practice. The importance of proper documentation and informed consent will be emphasized.

Pre-requisite: Admission to the program

### **MR309 - Intermediate Clinical Experience II**

**Clock Hours: 336**

Supervised sessions emphasizing development of medical imaging skills. Practical application of MRI imaging with an emphasis on safety, orientation to the equipment, proper scanning positions and planes, and general patient care. Students are required to successfully complete required clinical competency examinations supervised by a registered MRI technologist or clinical preceptor.

Pre-requisite: MR306

### **MR310 - Advanced Imaging**

**Clock Hours: 32**

Discussion of advanced MRI imaging topics to include fusion imaging, neurography, 3D printing and modeling, and remote scanning. Discussion of emerging trends in MRI to include artificial intelligence, quantitative MR, and MR lymphangiography. Guests with experience in these areas will be invited to speak.

Pre-requisite: MR304, MR307

### **MR311 - Registry Review**

**Clock Hours: 32**



**Cleveland Clinic**

**School of Health Professions**

Primary Magnetic Resonance Imaging Program

Provides a review of basic knowledge from previous courses and help the student prepare for the American Registry of Radiologic Technologist's ARRT National Registry Examination.

Pre-requisite: MR304, MR307

**MR312 - Advanced Clinical Experience**

**Clock Hours: 448**

Supervised sessions emphasizing development of medical imaging skills. Practical application of MRI imaging with an emphasis on safety, orientation to the equipment, proper scanning positions and planes, and general patient care. Students are required to successfully complete required clinical competency examinations supervised by a registered MRI technologist or clinical preceptor.

Pre-requisite: MR309