

**Common Course Outline**  
**RADT 240**  
**Introduction to Magnetic Resonance Imaging (MRI)**  
**6 Credits**

**The Community College of Baltimore County**

**Description**

**RADT 240 – 6 credits – Introduction to Magnetic Resonance Imaging (MRI)** introduces the student to Magnetic Resonance Imaging and patient care in the MRI suite. Topics include legal and ethical issues, introduction to MRI screening and safety, patient assessment, monitoring and management, interpersonal communication, venipuncture, infection control, contrast, and cross sectional anatomy. This course also provides the student with an introduction to MRI physics and Quality Control for the MRI equipment. This course is delivered both online and in a classroom setting with lectures and discussion.

**6 Credits**

**Prerequisite:** Admission into MRI Program

**Overall Course Objectives**

Upon completion of this course students will be able to:

1. define Magnetic Resonance Imaging;
2. use MRI terminology correctly;
3. describe proper precautions and screening while working in an MRI environment;
4. explain the mechanism by which MRI signal is produced and detected;
5. demonstrate current knowledge of biological effects and safety considerations when working in the MRI environment;
6. describe effective methods of communication with patients;
7. explain the need for informed consent;
8. explain various types of laws;
9. explain the historical and philosophical bases of ethics and the elements of ethical behavior;
10. assess patient vital signs and identify pulse rates, respiratory rates, blood pressure readings, and temperatures that are above and below normal values;
11. explain standard precautions and infection control policies;
12. identify preferred venous access sites and factors to consider in site selection;
13. demonstrate on a mannequin the ability to gain venous access using sterile technique;
14. describe the various types of phantoms used in MRI;
15. explain the frequency of quality control testing of various MR parameters;
16. describe gross anatomic relationships in the body; and
17. identify anatomical structures as seen in multiple orthogonal planes on MRI images.

## **Major Topics**

- I. Introduction to MRI
  - A. Screening
  - B. Equipment Safety
  - C. Environmental Safety
  - D. Instrumentation
- II. Patient Assessment, Monitoring and Management
  - A. Routine Monitoring
  - B. Emergency Response
  - C. Patient Transfer and Body Mechanics
  - D. Claustrophobic Patients
  - E. Sedated Patients
- III. Legal and Ethical Issues
  - A. Confirmation of Exam Requisition
  - B. Legal Issues
  - C. Patient Rights
  - D. Standard of Ethics
- IV. Interpersonal Communications
  - A. Modes of Communication
  - B. Challenges of Communication
  - C. Patient Education
  - D. Medical Terminology
- V. Infection Control
  - A. Terminology
  - B. Cycle of Infection
  - C. Standard Precautions
- VI. Venipuncture Techniques
  - A. Site Selection
  - B. Aseptic Technique
  - C. Injection Techniques
  - D. Pharmacology
- VII. Quality Control
  - A. Phantoms
  - B. Quality Control Testing
  - C. Signal to Noise Ratio
  - D. Center Frequency
- VIII. Contrast
  - A. Types
  - B. Contraindications
  - C. Administrative Routes
  - D. Risks/Complications
- IX. Sectional Anatomy
  - A. Bones of the Skull and Cranium
  - B. Brain
  - C. Spine
  - D. Neck

- E. Thorax
- F. Abdomen
- G. Pelvis
- H. Musculoskeletal

### **Course Requirements**

Grading/exams: Grading procedures will be determined by the individual faculty member but will include:

- Minimum of 4 discussion board postings
- Minimum of 10 quizzes
- Minimum of 3 homework assignments
- A comprehensive final exam

A minimum score of 75% is required to pass this course. The American Registry of Radiologic Technologists (ARRT) has established a minimum scaled passing score of 75. The MRI certificate program has developed standards of grading that are consistent with grading systems of other programs. Letter grades will be distributed according to the following standards.

- 92 - 100 A
- 83 - 91 B
- 75 - 82 C
- 65 - 74 D
- below 65 F

### **Other Course Information**

Students are required to utilize appropriate academic resources.

This course is a blended course, which includes classroom and online instruction.

This course is a required course in the MRI certificate program within the Radiography department. It is a 15 week course and is offered only in the fall semester.