

MASTER SYLLABUS

COURSE NO. HOURS, AND TITLE: RAD 384-4 - Magnetic Resonance Imaging
Technology

COURSE DESCRIPTION:

This course will focus on the physical principles of magnetic resonance imaging. Topics of discussion will include the history of magnetic resonance imaging, its physical principles, instrumentation, imaging techniques, contrast agents, patient care/safety, and quality assurance. Restricted to major.

PREREQUISITES TO: RAD 404 and 414

COURSE OBJECTIVES:

Upon completion of this course, the student will be able to:

1. Explain the physical principles of MRI.
2. List and explain the hardware components (instrumentation) of the MRI system.
3. Describe the process of signal encoding and image formation.
4. List and explain the design and application of MR imaging pulse sequences.
5. List and explain imaging parameters used in MRI.
6. List and describe the use of contrast agents in MRI.
7. Discuss flow phenomena and imaging.
8. Describe patient care/safety procedures.
9. List and explain common artifacts associated with MRI.
10. List and explain tests used to evaluate quality assurance in MRI.
11. Describe basic imaging applications for the head, spine, chest, abdomen, pelvis and musculoskeletal (joints).

TOPICAL OUTLINE:

Topics	Percentages of Time
1. Basic Principles	10%
2. Hardware	10%
3. Signal Encoding and Image Formation	5%
4. Imaging Parameters	15%
5. Pulse Sequence Design	10%
6. Contrast Agents	10%
7. Angiography	5%
8. Patient Care and Safety	10%
9. Artifacts	10%
10. Quality Assurance	10%
11. Imaging Procedures	5%

TEXTBOOKS:

Westbrook, C. & Roth, C. R. & Talbot, J. (2011). *MRI in practice* (4th ed.). Malden, MA: Blackwell Science, Inc.