MASTERS 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. Prerequisite: Limited to major, completion of ARRT in radiography, or consent of school.

PREREQUISITIES 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.
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:

<table>
<thead>
<tr>
<th>Topics</th>
<th>Percentages of Time</th>
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</thead>
<tbody>
<tr>
<td>1. Basic Principles</td>
<td>10%</td>
</tr>
<tr>
<td>2. Hardware</td>
<td>10%</td>
</tr>
<tr>
<td>3. Signal Encoding and Image Formation</td>
<td>5%</td>
</tr>
<tr>
<td>4. Imaging Parameters</td>
<td>15%</td>
</tr>
</tbody>
</table>
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: