

Course Competency

RTE 2575 MRI Principles and MR Safety

Course Description

This course is an introduction to the basic principles of MRI, including signal production, basic concepts in image formation and image contrast and resolution. It is intended to provide a solid foundation in MRI technology as well as an understanding of the MRI equipment and its appropriate and safe use. A practical approach to using the correct imaging sequences and parameters will be discussed. Emphasis will be placed in MRI Screening and MRI Safety.

Course Competency	Learning Outcomes
<p>Competency 1:The students will demonstrate knowledge and comprehension of basic principles of MRI by: 1. Explaining atomic structures, magnetic resonance, and Larmor equations. 2. Explaining various pulse sequences, image weighing and contrast. 3. Identifying major components of the MRI machine.</p>	<ol style="list-style-type: none"> 1. Critical thinking 2. Information Literacy
<p>Competency 2:The students will demonstrate knowledge and comprehension of Data collection, Spatial encoding, and Image formation by: 1. Explaining slice select, frequency and phase encoding gradients. 2. Explaining K- Space filling and Fast Fourier Transform (FFT). 3. Explaining the process of MRI data collection.</p>	<ol style="list-style-type: none"> 1. Critical thinking 2. Information Literacy
<p>Competency 3:The students will demonstrate knowledge and comprehension of MRI Scanning and Parameters and trade-offs by: 1. Explaining Signal to Noise Ratio, Contrast to Noise Ratio and Spatial resolution. 2. Explaining various steps to minimize MRI scanning time. 3. Explaining various pulse sequences such as spin echoes, gradient echoes, inversion recovery, and parallel imaging technique.</p>	<ol style="list-style-type: none"> 1. Critical thinking 2. Information Literacy

<p>Competency 4:The students will demonstrate knowledge and comprehension of vascular and cardiac imaging by: 1. Explaining various types of blood flow in our body. 2. Explaining various flow compensation techniques to avoid flow artifacts. 3. Explaining various gating techniques used in cardiac and vascular imaging.</p>	<ol style="list-style-type: none"> 1. Information Literacy 2. Critical thinking
<p>Competency 5:The students will demonstrate knowledge and comprehension of MRI equipment and MRI safety by: 1. Explaining types of magnets, radio frequencies, shimming techniques, and computer systems. 2. Explaining the uses of paramagnetic contrast agents in MRI to enhance image contrast. 3. Explaining functional MRI imaging techniques. 4. Explaining MR Safety-Devices and monitors in MRI. 5. Explaining various MR safety guidelines used in MRI.</p>	<ol style="list-style-type: none"> 1. Critical thinking 2. Information Literacy

Updated: FALL TERM 2227