BMED/MP/NRE 4750 Diagnostic Imaging Physics (Elective)

Catalog Description: BMED 4750 Diagnostic Imaging Phys (3-0-3)
Prerequisite(s): BMED 3110
Physics and image formation methods for conventional X-ray, digital X-ray CT, nuclear medicine, and magnetic resonance and ultrasound imaging.


Prepared by: John Oshinski

Topics Covered:
1. Conventional planar imaging
2. Digital x-ray imaging and computed tomography
3. Nuclear medicine imaging
4. Magnetic resonance imaging (MRI)
5. Ultrasound imaging

Course outcomes:
Students who complete this course will be able to:
Outcome 1: Understand x-ray, ultrasound, and magnetic resonance interactions with tissue and the various components of imaging systems (Student Outcome a)
Outcome 2: Use fundamentals of mathematics and physics to analyze image data (Student Outcomes a and k)
Outcome 3: Understand modern imaging devices and their application in medicine and industry (Student Outcome j)

Correlation between course outcomes and student outcomes:

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<tr>
<th>Course outcomes</th>
<th>BMED 4750</th>
<th>Biomedical Engineering Student Outcomes</th>
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The Wallace H. Coulter Department of Biomedical Engineering Student Outcomes:
a. an ability to apply knowledge of mathematics, science, and engineering;
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, societal, political, ethical, health and safety, manufacturability, and sustainability;
d. an ability to function on multidisciplinary teams;
e. an ability to identify, formulate, and solve engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively;
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in lifelong learning;
j. a knowledge of contemporary issues;
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;