

Minnesota State University Moorhead

PHYS 318: Biophysics and Medical Imaging

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:

This course requires the following prerequisite

MATH 262 - Calculus II

Corequisites: None

MnTC Goals: None

This course is a calculus-based study of biophysics and medical imaging techniques and topics covering optical microscopy, computed (axial) tomography (CT or CAT), magnetic resonance imaging (MRI), ultrasound imaging and positron emission tomography (PET). Techniques in real space and Fourier space imaging will be covered including resolution, aberrations and exposure limitations. Special attention will be given to radiation effects and nuclear medicine topics. This course will use cooperative learning techniques along with guided labs covering selected techniques.

B. COURSE EFFECTIVE DATES: 08/27/2007 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Radiation
2. Radiation dose
3. X-rays
4. Computed tomography
5. Ultrasound imaging
6. Positron emission tomography
7. Magnetic resonance imaging
8. Nuclear imaging

D. LEARNING OUTCOMES (General)

1. Demonstrate a mastery of a wide variety of skills appropriate to physics: checking results, testing limiting cases, analyzing data, formulating a hypothesis
2. Demonstrate a mastery of content knowledge relevant to medical physics

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted