Minnesota State University Moorhead

BIOL 616: Biomedical Imaging and Therapies

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

How do you identify and treat cancer non-invasively? This course provides a current look at non-invasive biomedical imaging methods along with related treatment modalities. Readings from a recently published text will be augmented by discussions of primary literature papers, along with some activities to relate physical concepts.

B. COURSE EFFECTIVE DATES: 02/02/2019 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Telescopes for Inner space: Fiber optics and endoscopes
2. Lasers in medicine: Healing with light
3. Seeing with sound: Diagnostic ultrasound imaging
4. X-ray vision: Diagnostic X-rays and CT scans
5. Images from radioactivity: Radionuclide scans, SPECT, and PET
6. Radiation therapy and radiation safety in medicine
7. Magnetic resonance imaging (MRI)
8. Ethics and future trends

D. LEARNING OUTCOMES (General)

1. Describe major imaging methods using visible light, x-rays, particles, sound and magnetic fields.
2. Evaluate lines of evidence supporting the benefits and risks of different imaging and treatment modalities.
3. Analyze current research advances in imaging and treatment methods.
4. Explore physical concepts to understand and explain imaging methods.
5. Practice research skills by reading, synthesizing, and communicating results from primary literature.

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted