

Course Syllabus

Second Semester - 2013/2014

General Information

Course name	Course code	Credits	Contact hours
Medical Imaging Systems 2	BMTS482	2 lecture+1 lab	2 lecture+2 lab

Instructors/ Coordinators

	Instructor	Coordinator
Name	Dr. Eid Abdelmunem	Dr. Eid Abdelmunem
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Text Book

Title	Essential Nuclear Medicine Physics
Author/Year	E. B. Podgorsak / 2006

Supplemental materials

Recommended Textbooks and Reference Material		
Title	Christensen's Physics of Diagnostic Radiology	
Author/Year	Thomas S. Curry, James E. Dowdey, Robert E. Murry / 1990	
Electronic Materials (e.g. Web Sites, Social Media, Blackboard, etc.)		
Web sites	http://en.wikipedia.org/wiki/CT_scan	http://www.learningradiology.com/medstudents/medstudtoc.htm
	http://en.wikipedia.org/wiki/Nuclear_medicine	http://www.radiologyeducation.com/

Specific Course Information

a. Brief description of the content of the course (Catalog Description)
During this course the student understand the principle of advanced imaging modalities and understand technologies of different imaging instruments. This course focuses on many imaging modalities including Computed Tomography (CT), Nuclear Imaging, Combined PET-CT, open and closed MRI systems and finally PET-MRI system.
b. Prerequisites (P) or Co-requisites (C)
(P) Medical Imaging Systems 1 - BMTS472
c. Course type (Mandatory or Elective)
Mandatory

Specific Goals

a. Specific outcomes of instruction.

By the end of this course, the student should be able to:

- Compare the five generations of computed tomographic imaging systems and demonstrate the principles of CT imaging. (a)
- Describe the working principles of Nuclear and Magnetic Resonance Imaging. (a)
- Compare different imaging modalities studied. (c)
- Translate the studied radiation safety techniques in laboratory and hospital, including contrast agents applications. (i)

b. Student outcomes addressed by the course.

a	b	c	d	e	f	g	h	i	j	k
✓		✓						✓		

Brief list of topics to be covered

Topics	No. of Weeks	Contact hours
Computed Tomography, Basic principle and development	1	4
Techniques from 1st to 5th generation Spiral CT Basic Components of CT Radiation Dose considerations	2	8
Contrast media methodology and application Radiation dose and safety considerations	2	8
Nuclear Medicine Radioisotopes production Scintillation detectors Gamma Camera	2	8
Single Photon Emission Computed Tomography (SPECT)	1	4
Positron Emission Tomography (PET) Nuclear Medicine	2	8
Magnetic Resonance Imaging Basic Physics of MRI	1	4
CT vs. MRI Instrument & Imaging Safety Considerations	2	8
Combined PET-CT Combined PET-MRI	2	8