DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS

EE 472: Biomedical Imaging Systems

COURSE TITLE	*CODE & NUMBER*	*SUBJECT AREA*	Contact Hours			Credit Units
			Th.	*Pr.*	*Tr.*	
Biomedical Imaging Systems	**EE472**	Engineering	3	1	0	3
Pre-requisites:	EE302, EE370					
Course Role in Curriculum *(Required/Elective):*	Required course					
Catalogue Description: Fundamentals of medical imaging physics and systems: X-ray radiography, ultrasound, radionuclide imaging, and magnetic resonance imaging (MRI). Biological effects of each modality. Tomographical reconstruction principles, including X-ray computed tomography (CT), position emission tomography (PET), and single-photon emission computed tomography (SPECT).						

***Textbooks*:** *(Author, Title, Pub., year)*
Jerry L. Prince and Jonathan Links, Medical Imaging Signals and Systems, Pearson, 2nd Edition, 2015
Nadine Barrie Smith, Andrew Webb, Introduction to Medical Imaging: Physics, Engineering and Clinical Applications, Cambridge University Press, 2010.

***Supplemental Materials*:** Slides, notes, and problem sets

***Course Learning Outcomes*:**

By the completion of the course the students should be able to:

1. Analyze ultrasound imaging techniques.
2. Analyze magnetic resonance imaging techniques.
3. Analyze x-ray imaging techniques.
4. Analyze CT imaging techniques.
5. Analyze nuclear medicine-based imaging techniques.

***Topics to be Covered*:**	***Duration in Weeks***
1. Ultrasound imaging.	3
2. Magnetic resonance imaging	3
3. X-Ray imaging	4
4. Computed Tomography	2
5. Nuclear Medicine	2

Key Student Outcomes addressed by the course: (Put a ✓ sign)

(1)	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	✓
(2)	An ability to apply the engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
(3)	An ability to communicate effectively with a range of audiences	
(4)	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
(5)	An ability to function effectively on a team whose members together provide leadership, creates a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
(6)	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
(7)	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

Instructor or course coordinator: Dr. Bandar Hakim
Last updated: Spring 2020