PURDUE UNIVERSITY FORT WAYNE

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Course	ECE 50700 – Introduction to Biomedical Imaging
Type of Course	Graduate level course, can be Technical elective for EE/CmpE
Catalog Description	This course covers the major aspects of standard medical imaging systems used today including X-Ray, computed tomography (CT), magnetic resonance imaging (MRI), ultrasound (US) and positron emission tomography (PET). The fundamental physics and engineering underlying each imaging modality are reviewed. The image reconstruction, processing and visualization are examined. Students will gain technical knowledge and an overview of current status of medical image processing and visualization.
Credits	3
Contact Hours	3
Prerequisite Courses	ENGR 12800, MA 35100, PHYS 152
Corequisite Courses	
Prerequisites by Topics	Linear algebra Programming experience in Matlab Basic college physics
Textbook	*Andrew Webb, "Introduction to Biomedical Imaging", Wiley-IEEE Press*
Course Objectives	By the end of the course each student should be able to – Understand the basic physical principles of modern medical imaging – Understand basic data acquisition strategies and image reconstruction techniques. – Understand the basic medical image processing and visualization. – Gain experience in clinical applications of each medical imaging modality.
Lecture Topics	– Review of linear algebra, linear systems and Fourier transformation – X-ray mammography – Computed tomography – Ultrasonic imaging – Magnetic resonance imaging

	– Positron emission tomography
Computer Usage	High
Laboratory Experience	Low
Design Experience	Median
Coordinator	Bin Chen, Ph.D.
Date	11/14/2022