

University of Toledo
College of Medicine
Master of Science in the Biomedical Sciences
Medical Physics Concentration

- Course Number:** MPHY6010/MPHY8040
- Course:** Survey of Diagnostic Medical Imaging I
- Course Description:** This course considers the physical principles and instrumentation of x-ray based diagnostic medical imaging systems including x-ray production, x-ray interaction with matter, and radiographic, mammographic, fluoroscopic, and computed tomography imaging systems.
- Course Schedule:** Fall 2016
Thursday 9:00am – 12:00pm
- Credits:** Three Credit Hours
- Instructor:** Kerry Krugh, Ph.D.
kerry.krugh@utoledo.edu
419-383-4303
- Prerequisite:** Consent of instructor.
- Objectives:** Upon completion of the course, the student will:
1. Have an understanding of basic physical principles relative to x-ray production and interaction.
 2. Have developed an understanding of basic instrumentation for x-ray based imaging systems including radiographic, fluoroscopic, mammographic, and computed tomography imaging systems and factors that affect imaging performance.
 3. Understand the factors affecting image quality in radiographic, fluoroscopic, mammographic, and computed tomography imaging including artifact identification.
 4. Describe radiation safety and quality control practices for radiographic, fluoroscopic, mammographic and computed tomography imaging.
- Required Text:** J.T. Bushberg, J.A. Seibert., E.M. Leidholdt, & J.M. Boone (2012). The Essential Physics of Medical Imaging (3rd edition). Lippincott Williams & Wilkins.
- Reference Text:** H.E. Johns and J.R. Cunningham (1983). Physics of Radiology. Charles C. Thomas, Inc.
- D.R. Dance, et.al. (2014). Diagnostic Radiology Physics: A Handbook for Teachers and Students. International Atomic Energy Agency.
<http://www-pub.iaea.org/books/IAEABooks/8841/Diagnostic-Radiology-Physics-A-Handbook-for-Teachers-and-Students>
- A.B. Wolbarst (2005). Physics of Radiology, (2nd edition). Medical Physics Publishing.
- A.B. Wolbarst, R.G. Zamenhof & W.R. Hendee (2006). Advances in Medical Physics 2006. Medical Physics Publishing.
- A.B. Wolbarst, K.L. Mossman & W.R. Hendee (2008). Advances in Medical Physics 2008. Medical Physics Publishing.

Grading Procedure:

Item	Points	Percent of Total Grade
Midterm Exam	100	20%
Final Exam	100	20%
Weekly Homework Assignments	280 (14 @ 20 points)	56%
Classroom Attendance/Participation	20	4%
TOTAL	500	100%

Course Calendar:

Date:	Topic:	Bushberg Chapters:
8/25/2016	X-Ray Basics and X-Ray Interactions	Chap. 1, 2, 3
9/1/2016	X-Ray Production, Tubes, and Generators	Chap. 6
9/8/2016	Aspects of Image Quality	Chap. 4
9/15/2016	General Radiography	Chap. 7
9/22/2016	General Radiography	Chap. 7
9/29/2016	Fluoroscopy	Chap. 9
10/6/2016	Fluoroscopy	Chap. 9
10/13/2016	MIDTERM EXAM	
10/20/2016	Mammography	Chap. 8
10/27/2016	Mammography	Chap. 8
11/3/2016	Computed Tomography	Chap. 10
11/10/2016	Computed Tomography	Chap. 10
11/17/2016	Computed Tomography	Chap. 10
11/24/2016	THANKSGIVING BREAK	
12/1/2016	Computed Tomography	Chap. 10
12/8/2016	Diagnostic X-Ray Dosimetry	Chap. 11
12/15/2016	FINAL EXAM	

Disclaimer: "The instructor reserves the right to amend this syllabus as deemed necessary and will communicate such amendment to the students in the course."