Radiation Dosimetry I

UT HSC Medical Physics Course MPHY6120/8120 (CRN: 56283/56269)

Fall semester 2015

Class Hours: Monday 10:00 A.M. - 12:00 P.M.

Guidance Hour: Monday 09:00 A.M. - 10:00 A.M.

Text Book: H. E. Johns and J. R. Cunningham,
Physics of Radiology, 4th edition

Handouts: http://www.utoledo.edu/med/depts/radther/Courses.html
Click on Radiation Dosimetry I

Instructors: Diana Shvydka, Ph.D.; E. Ishmael Parsai, Ph.D.

Grading: The final grade is determined based on relative performance of the class using the following scheme:

6 quizzes:	50%
Midterm exam:	25%
Final exam:	25%

Course outline:

1. Review of basic concepts
2. Production and properties of x rays
3. The fundamentals of nuclear physics
4. High energy machines
5. The interaction of ionizing radiation with matter
6. The basic interactions between photons and charged particles with matter
7. Measurement of radiation: dosimetry concepts and theory
8. The quality of x rays and half-value layer
9. Measurement of radiation: instrumentation and techniques
10. The interaction of single beams of x and gamma rays with scattering medium
11. Treatment planning: single beam
12. Treatment planning: combinations of beams
14. Nuclear medicine
15. Radiation protection
16. Diagnostic radiology

Chapters	*Date*	*Homework*	*Exam/Quiz*
1-2. Review of basic concepts. Production and properties of x rays	08/24	Ch.1: 9,10,13,14,20 Ch.2: 4,5,6,15,16	
3. The fundamentals of nuclear physics	08/31	4,6,8,14,23,25	Quiz Ch. 1-2
****Labor day – no class	09/07		
4. High energy machines	09/14	1,6,7,8	
5. The interaction of ionizing radiation with matter	09/21	13,14,16,18,23	Quiz Ch. 3-4
6. The basic interactions between photons and charged particles with matter	09/28	6,11,20,23,24	
****Fall break – no class	10/05		
7-8. Measurement of radiation: dosimetry concepts and theory. The quality of x rays	10/12	Ch7: 3,7,10,12,14 Ch8: 2,4,6,9,11	Quiz Ch. 5-6
Chapters 1-8	10/19		**Midterm Exam**
9. Measurement of radiation: instrumentation and techniques	10/26	6,9,14, 21, 24	
10. The interaction of single beams of x and gamma rays with scattering medium	11/02	6,9,11,14, 15	
11-12. Treatment planning: single beam and combinations of beams	11/09	Ch.11: 2,4,7,9,11 Ch.12: 5,7,8,16,18	Quiz Ch. 9-10
Introduction to physics of solid state devices	11/16		
14. Nuclear medicine	11/23	4,7,10,12,14	Quiz Ch. 11-12
15. Radiation protection	11/30	2,3,6	
16. Diagnostic radiology	12/07	6,8,10,14,39	Quiz Ch. 14-15
Chapters 9-16	12/14		**Final Exam**