OAKLAND UNIVERSITY
School of Health Sciences
Biomedical Diagnostic and Therapeutic Sciences Program
RAD-331 Radiologic Physics I Winter 2018

COURSE: Radiologic Physics I
PROFESSOR: Scott Emerson, M.S
OFFICE: Beaumont Royal Oak
OFFICE PH. #: 248-551-3172

DAY/TIME: MW 1730-1915 (530-715 PM)
CLASS LOCATION: HHB 5023
OFFICE HOURS: (by request, email)
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CREDITS: 3

COURSE DESCRIPTION: *The principles of atomic theory, x-ray production and generation, and the characteristics of x-rays. The entire x-ray circuit is covered, as well as the function of the circuits' individual components. Basic electronics, electrostatics, magnetism, the structure of matter, etc. are covered.*

COURSE OBJECTIVES/LEARNING OUTCOMES:

1. *Be able to list and describe the function of the components of the X-Ray imaging system.*
2. *Be able to list and describe the function of the components of the X-Ray tube.*
3. *Be able to list and describe the methods of X-Ray production.*
4. *Be able to list, describe, and calculate the effects of machine settings on X-Ray Quantity.*
5. *Be able to list and describe the effects of machine settings on X-Ray Quality.*
6. *Be able to list and describe the methods of X-Ray interaction.*

REQUIRED TEXT:
Bushing, S; Radiologic Science for Technologists, 10th ed
Huda, W.; Review of Radiologic Physics, 4th ed.

Carlton, R; Principles of Radiographic Imaging; 5th ed ***(supplement main texts)***
Carroll, Q.; Radiography in the Digital Age ***(supplement main texts)***

COURSE FORMAT: *In-class lecture*

Grading Scale: *Same as other RAD classes*

Percent	Grade point	Percent	Grade point	Percent	Grade point	Percent	Grade point
97-100	4.0	85	3.2	74	2.4	66	1.6
96	3.9	84	3.1	73	2.3	65	1.5
95	3.8	80-83	3.0	72	2.2	64	1.4
94	3.7	79	2.9	71	2.1	63	1.3
93	3.6	78	2.8	70	2.0	62	1.2
90-92	3.5	77	2.7	69	1.9	61	1.1
88-89	3.4	76	2.6	68	1.8	60	1.0
86-87	3.3	75	2.5	67	1.7		

CLASS POLICIES:

1. *Academic conduct policy: All members of the academic community at Oakland University are expected to practice and uphold standards of academic integrity and honesty. Academic integrity means representing oneself and one's work honestly. Misrepresentation is cheating since it means students are claiming credit for ideas or work not actually theirs and are thereby seeking a grade that is not actually earned. Following are some examples of academic dishonesty:*
    a. *Cheating on examinations. This includes using materials such as books and/or notes when not authorized by the instructor, copying from someone else's paper, helping someone else copy work, substituting another's work as one's own, theft of exam copies, or other forms of misconduct on exams.*
    b. *Plagiarizing the work of others. Plagiarism is using someone else's work or ideas without giving that person credit; by doing this students are, in effect, claiming credit for someone else's thinking. Whether students have read or heard the information used, they must document the source of information. When dealing with written sources, a clear distinction should be made between quotations (which reproduce information from the source word-for-word within quotation marks) and paraphrases (which digest the source of information and produce it in the student's own words). Both direct quotations and paraphrases must be documented. Even if students rephrase, condense or select from another person's work, the ideas are still the other person's, and failure to give credit constitutes misrepresentation of the student's actual work and plagiarism of another's ideas. Buying a paper or using information from the World Wide Web or Internet without attribution and handing it in as one's own work is plagiarism.*
    c. *Falsifying records or providing misinformation regarding one's credentials.*
    d. *Unauthorized collaboration on computer assignments and unauthorized access to and use of computer programs, including modifying computer files created by others and representing that work as one's own*
2. *Add/Drops***:**
   The university policy will be explicitly followed. It is the student's responsibility to be aware of deadline dates for dropping courses.
3. *Special Considerations**:***
   Students with disabilities who may require special considerations should make an appointment with campus Disability Support Services, 106 North Foundation Hall, phone 248 370-3266. Students should also bring their needs to the attention of the instructor as soon as possible. For academic help, such as study and reading skills, contact the Academic Skills/Tutoring Center, 103 North Foundation Hall, phone 248 370-4215.

Additional items to be included

4. *Attendance mandatory. If a class will be missed, please email ahead of time with reason of absence. If unable, please email ASAP with reason for absence. If no reason, a 0 will be given for daily quiz.*
5. *Late submission policy – assignments will be due the day requested. If there is a legitimate reason for turning in an assignment, full credit will be considered. If an assignment is late with no reason, 25% of the maximum achievable grade will be reduced per day late.*
6. *Missing of tests – if a test is going to be missed, you must notify ahead of time with a legitimate reason for absence, with consideration for emergencies. A make-up date will be scheduled.*
7. *Cell phones must be in silent mode for class.*
8. *Computers, tablets are allowed during lecture to follow along with the presentation or for note taking. If used for other reasons, they must be turned off and put away.*
9. *If there are any questions during the semester, it is best to email or call my office. I check both email addresses and check my office voicemail. It is better to email for a question than make an assumption and be wrong.*

COURSE SCHEDULE

Week	Month	Day	Date	Topic Covered
1	January	M	1	***NO CLASS***
2		W	3	Introduction, Review of Physics
3		M	8	Chapter 5 – Operating Console, Autotransformer
4		W	10	Chapter 5 – Exposure Timers, High-Voltage Generator
5		M	15	***NO CLASS – Martin Luther King Jr. Day***
6		W	17	Go over Chapter 5 Exercise, Review
7		M	22	**TEST – CHAPTER 5 (Topic Due)**
8		W	24	Chapter 6 – External Components, Cathode
9		M	29	Chapter 6 – Anode, X-Ray Tube Failure, Rating Charts
10		W	31	Go over Chapter 6 Exercise, Review
11	February	M	5	**TEST – CHAPTER 6 (Proposal Due 2/5)**
12		W	7	Chapter 7 – Electron Target Interactions X-Ray Emission Spectrum
13		M	12	Chapter 7 – Factors Affecting Spectrum
14		W	14	Chapter 8 – X-Ray Quantity
15		M	19	***Break – Week Off***
16		W	21	***Break – Week Off***
17		M	26	Chapter 8 – X-Ray Quality
18		W	28	Review, Go over Chapter 7 & 8 Exercise
19	March	M	5	Review, Go over Chapter 7 & 8 Exercise
20		W	7	**TEST – CHAPTER 7 & 8**
21		M	12	Chapter 9 – Five X-Ray Interactions With Matter
22		W	14	Chapter 9 – Five X-Ray Interactions With Matter
23		M	19	Chapter 9 – Five X-Ray Interactions With Matter
24		W	21	Review, Go over Chapter 9 Exercise
25		M	26	**TEST – CHAPTER 9**
26		W	28	Project presentations **(All presentations Due)**
27	April	M	2	Project presentations
28		W	4	Project presentations
29		M	9	Review of Ch 5 – 9, Questions Answered (Proj pres if needed)
30		W	11	Review of Ch 5 – 9, Questions Answered
31		M	16	Review
32		W	25 (TBD)	**FINAL – Comprehensive, Ch. 5 – 9**

Physics I Grading

Chapter Tests	40% (10% each)
Final	20%
Project Proposal	5%
Project Presentation	15%
Quizzes	10%
Chapter exercises	5%
Workbook	5%
Total	**100%**