TIME: Tuesdays, 1:30-3:20

PLACE: Large Conference Room, Gershenson ROC

INSTRUCTOR: Jay Burmeister, Ph.D.

GTA: Eric Morris, M.S.

REQUIRED TEXT: “Introduction to Radiological Physics and Radiation Dosimetry”
Frank H. Attix, Wiley-Interscience

Course pack for ROC 7040

ADDITIONAL REFERENCES:
“Radiation Detection and Measurement” Glenn F. Knoll, Wiley
“Physics and Dosimetry of Therapy Electron Beams” Stanley C. Klevenhagen, Medical Physics Publishing

LEARNING OBJECTIVES:
At the completion of this course, students should be able to:
a) describe the fundamentals of radiation dosimetry including various aspects of radiation interaction and cavity theories
b) describe the application of ionization chambers for radiation dosimetry along with all relevant practical considerations and correction factors
c) calibrate a photon or electron beam from a linear accelerator using TG-51
d) discuss alternative dosimetry techniques along with their theory of operation and relative advantages and disadvantages

METHODS OF INSTRUCTION:
Lecture / lecture discussion

READING ASSIGNMENTS:
It is strongly recommended that students read the assigned pages of the text and/or handouts before each class.
GRADING:

Exam 1 – 25% (of final grade)
Exam 2 – 25%
Exam 3 – 30% (final is cumulative)
Homework – 20%

Grades will be determined based on the following scale:

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<th>Grade</th>
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<td>A</td>
<td>91-100%</td>
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<td>A-</td>
<td>87-91%</td>
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<td>B+</td>
<td>83-87%</td>
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<td>B</td>
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<td>B-</td>
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<td>C+</td>
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<td>C</td>
<td>67-71%</td>
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<td>F</td>
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All exams will be three hours. All homework sets will be graded based on 10 points per problem.

OFFICE HOURS:

GTA office hours will be in the Gershenson R.O.C. on Mondays 3:00-4:00

Email:

Dr. Burmeister is available at any time for consultation. Please call for an appointment as some times may be restricted by clinical duties.

Tel: (313) 576-9617
Email: burmeist@karmanos.org

ACADEMIC HONESTY:

Students must not copy material from homework, reports, or exams written by other students. You are encouraged to discuss homework problems with other students, but the final written version must be uniquely yours. You may not consult any references or written material on exams unless you are explicitly allowed to do so (in writing). Exams are returned to you for your benefit and I request that you not share your exams with future students. This is for their benefit and yours. You share in the responsibility we have as a graduate program to assure that trainees have the ability to appropriately treat patients in a setting which presents grave potential consequences. This of course also implies that you should not attempt to solicit such material from former students. Any acts of academic dishonesty shall be dealt with according to departmental and University policies.

WITHDRAWAL POLICY:

In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. Students who wish to withdraw from the class can initiate a withdrawal request on Pipeline. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. More information on this can be found at:

http://reg.wayne.edu/pdf-policies/students.pdf
APPEALS POLICY:
Details of appeals procedures can be obtained from Dr. Jay Burmeister, Director of the Medical Physics Graduate Program.

DISABILITY:
If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

RELIGIOUS HOLIDAYS:
(from the online Academic Calendar): Because of the extraordinary variety of religious affiliations of the University student body and staff, the Academic Calendar makes no provisions for religious holidays. However, it is University policy to respect the faith and religious obligations of the individual. Students with classes or examinations that conflict with their religious observances are expected to notify their instructors well in advance so that mutually agreeable alternatives may be worked out.

STUDENT SERVICES:
The Academic Success Center (1600 Undergraduate Library) assists students with content in select courses and in strengthening study skills. Visit www.success.wayne.edu for schedules and information on study skills workshops, tutoring and supplemental instruction (primarily in 1000 and 2000 level courses). The Writing Center is located on the 2nd floor of the Undergraduate Library and provides individual tutoring consultations free of charge. Visit http://www.clas.wayne.edu/writing/ to obtain information on tutors, appointments, and the type of help they can provide.
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<th>Homework</th>
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| Jan. 10 | Radiation Dosimetry Quantities and Absorption of Radiation by Matter (Review) | Coursepack Chapter 1  
Attix 1-34, 339-343  
J&C 200-214, 217-224 |          |
| Jan. 17 | No Class                                                             |                                                                        |          |
| Jan. 24 | Cavity Theory                                                        | Coursepack Chapter 2  
Attix 231-255                                                                    | 1        |
| Jan. 27 | Fundamentals of Dosimetry                                           | Coursepack Chapter 3  
Attix 264-295, 418-436                                                      | 2        |
| Jan. 31 | Field Ionization Chambers                                           | Coursepack Chapter 4  
Attix 304-326                                                                    | 3        |
| Feb. 7  | First Exam (9:00-12:00)                                              |                                                                        | 4        |
| Feb. 14 | Corrections to Ion Chamber Measurements (Part I)                     | Coursepack Chapter 5  
Attix 326-330, 380-385                                                             |          |
| Feb. 21 | Corrections to Ion Chamber Measurements (Part II)                    | Coursepack Chapter 6  
Attix 330-338  
J&C 290-300                                                              | 5        |
| Feb. 28 | Calibration of Ion Chambers and Electrometers                       | Coursepack Chapter 7  
Attix 346-357  
Coursepack Chapter 8  
Attix 357-369, 376-380                                                      | 6        |
| Mar. 7  | Calibration of Photon Beams With an Exposure Calibrated Ion Chamber  | Coursepack Chapter 9  
TG-51 Report                                                                   | 7        |
| Mar. 10 | Calibration of Electron Beams With an Absorbed Dose Calibrated Ion Chamber | Coursepack Chapter 10  
Attix 380-391  
TG-25, TG-70  
TG-39 Report 1251-1259                                                | 8        |
| Mar. 14 | Spring Recess                                                       |                                                                        |          |
| Mar. 21 | Second Exam (9:00-12:00)                                            |                                                                        | 9        |
| Mar. 28 | Integrating Dosimeters (TLDs, OSLDs, Film, gel dosimetry, calorimetry) | Coursepack Chapter 11  
Attix 395-418  
Jursinic, Med Phys                                                        |          |
| Apr. 4  | No Class                                                             |                                                                        |          |
| Apr. 11 | No Class                                                             |                                                                        |          |
| Apr. 18 | Pulse Mode Detectors & Diodes                                       | Coursepack Chapter 12  
Attix 438-450, 457-462                                                         | 10       |
| Apr. 25 | FINAL EXAM (9:00-12:00)                                             |                                                                        |          |