

Spring 2023

Therapeutic Radiological Physics I

BME 6591 | Section 21D9 | 3.0 Credit

Instructors:	Dr. Luke Maloney luke.maloney@ufl.edu 352-265-7848 Dr. Amanda Schwarz ab7325@ufl.edu 352-265-7855	Time:	Monday 2:00-4:00 PM Wednesday 2:00-3:00 PM
Teaching Assisant:	Jingxi Weng jweng1@ufl.edu	Room:	Large Conference Room (1115) Davis Cancer Pavilion

Course description and objectives: This is a graduate-level, introductory course in basic therapeutic radiation physics. Topics discussed will include the basic working principles of clinical radiation generators, principles and methods for measurement of ionizing radiation, conventional and historical methods for dosimetric calculations, treatment planning for radiation therapy, and specific topics relevant to the modern practice of radiation therapy.

Office hours: Scheduled by appointment via email.

Prerequisites/Co-requisites: Radiological Physics, Measurements and Dosimetry (BME 6535), or permission of the instructor(s).

Required textbooks and software:

Required:

1. Khan, F. M. and Gibbons, J. P., *Khan's The Physics of Radiation Therapy*, Fifth edition. Philadelphia, PA: LWW, Apr. 2014, ISBN: 9781451182453

Recommended:

1. Attix, F. H., *Introduction to Radiological Physics and Radiation Dosimetry*, 1st edition. New York: Wiley-VCH, Jan. 1991, ISBN: 9780471011460
2. MATLAB, Python, Microsoft Excel

Recommended materials: Handouts will be distributed as necessary by the instructor(s). These may include reports of task groups of the American Association of Physicists in Medicine (AAPM) (www.aapm.org). Students are encouraged to join AAPM as student members for access to reports and other services, particularly if pursuing a career in medical physics.

Material and supply fees: No additional fees.

Course schedule:

This schedule is tentative and subject to change. Labs will be scheduled as clinic hours allow.

lecture	weekday	date	topic
1	M	01/09/23	introduction to therapeutic medical physics
2	W	01/11/23	clinical radiation generators
3	W	01/18/23	clinical radiation generators
4	M	01/23/23	clinical radiation generators
5	W	01/25/23	interactions of ionizing radiation
6	M	01/30/23	measurement of ionizing radiation
7	W	02/01/23	measurement of ionizing radiation
8	M	02/06/23	measurement of ionizing radiation
9	W	02/08/23	dose distribution and scatter analysis
10	M	02/13/23	dose distribution and scatter analysis
11	W	02/15/23	quality of x-ray beams
12	M	02/20/23	measurement of absorbed dose
13	W	02/22/23	measurement of absorbed dose
14	M	02/27/23	Midterm I
15	W	03/01/23	orthovoltage units
16	M	03/06/23	a system of dosimetric calculations
17	W	03/08/23	a system of dosimetric calculations
18	M	03/20/23	a system of dosimetric calculations
19	W	03/22/23	isodose distributions
20	M	03/27/23	isodose distributions
21	W	03/29/23	isodose distributions
22	M	04/03/23	Midterm II
23	W	04/05/23	patient data, corrections, and setup
24	M	04/10/23	patient data, corrections, and setup
25	W	04/12/23	patient data, corrections, and setup
26	M	04/17/23	field shaping, skin dose, field separation
27	W	04/19/23	field shaping, skin dose, field separation
28	M	04/24/23	field shaping, skin dose, field separation
29	W	04/26/23	TBD

Attendance, class expectations, and make-up work: Attendance of lectures is mandatory,

both for students attending in-person and virtually. Penalties for unexcused absences will be assessed at the discretion of the instructor(s), up to a 2% deduction in cumulative average for each. Please make arrangements for excused absences in advance. For an absence to be excused, it must be consistent with university policies in the Graduate Student Handbook (<http://graduateschool.ufl.edu/>), and appropriate documentation must be provided.

Students will regularly be assigned mandatory reading as part of class preparation - it is expected that readings are completed prior to the session in which they will be discussed. Assigned homework and projects must be completed – graded homework is due no later than 5:00 PM on the date it is due. Extensions may be given at the discretion of the instructor(s) for excused absences. Any in-class assignment missed due to an unexcused absence will be assessed a grade of zero.

Evaluation and grading policy: Assigned work will be assessed by the instructor(s) and/or the teaching assistant(s). Final grades will be determined based on weighting indicated in the table below.

assignment	total points	% of final grade
homework and lab reports	100	15
quizzes	100	5
midterm exam I	100	20
midterm exam II	100	20
final exam	100	40

Letter grades will be assigned according to the following scale:

percent	grade
93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
0-59	E

More information on the UF grading policy is available in the Graduate Student Handbook (<http://graduateschool.ufl.edu/>).

Students requiring accommodations: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565; <https://disability.ufl.edu>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor(s) when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course evaluation: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Academic conduct: Integrity, honesty, and respect are essential to any academic exercise. UF students are bound by the Student Honor Code and the Student Conduct Code via university regulation. The Honor Code (available at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies unacceptable behaviors in the course setting and possible sanctions. You are obligated to report any condition which facilitates academic misconduct to the appropriate personnel. If you have any questions or concerns, please consult with the instructor(s) or teaching assistant(s).

In-class recording: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.