

Spring 2022

## Therapeutic Radiological Physics I

BME 6591; Section 21D9; 3 Credits

### CLASS MEETING INFO

Class Meeting Time: Online video review schedule: please follow posted schedule on CANVAS; Reflective lectures and labs will be held on Monday or Wednesday after 3PM, please refer to page 2 for detail schedule

Location: Davis Cancer Center Room 1115 (Large conference Room at Radiation Oncology Department)

### INSTRUCTORS

Dr. Bo Lu (**Coordinator**), Dr. Guanghua Yan, Dr. Sanjiv Samant, Dr. Jonathan Li, Dr. Chihray Liu and Dr. Darren Kahler

Email Address: [lubo@shands.ufl.edu](mailto:lubo@shands.ufl.edu)

Office Phone Number: 352-265-8217

Office Hours: *appointment requested through email.*

### TEACHING ASSISTANTS

Perez-Sanchez, James

Email Address: [jperezsanchez@ufl.edu](mailto:jperezsanchez@ufl.edu)

Office Hours: *appointment requested through email*

### DESCRIPTION

Introductory graduate course in basic therapeutic radiation physics (3 Credits)

### PRE-REQUISITES/CO-REQUISITES

BME 6535 (RAD PHYS & DOSIMETRY) and BME6590(MEDICAL PHYSICS, permission of Dr. Bo Lu.

### OBJECTIVES

To have the basic understanding and knowledge of the principles of clinical radiation generators, the principles and methods of Ionizing Radiation measurement, conventional dosimetric calculation and treatment planning system.

### MATERIALS AND SUPPLY FEES

Covered by Tuition/Registration

### REQUIRED TEXTBOOKS & SOFTWARE

- Title: The Physics of Radiation Therapy
- Author: Faiz M. Khan
- Publisher and edition: Lippicott Williams and Wilkins, 5th ed.
- ISBN number: 0-7817-8856-4

### RECOMMENDED MATERIALS

Handouts or AAPM Task Group Reports to be distributed by instructor. It is recommended that students join American Association of Physicists in Medicine (AAPM) ([www.aapm.org](http://www.aapm.org)) as student members for free access to reports and other services. Also see [www.medicalphysicsweb.org](http://www.medicalphysicsweb.org) for literature and product information.

## COURSE SCHEDULE

### PART I: Basic Physics

1. Introduction and orientation. . . . . 1RL (Lu) (1/5(Wed))
2. Clinical Radiation Generators . . . . . 4VL+1RL (Yan/Bassett) (Week 1/10 - 1/14, Week 1/17 - 1/21) (1/26(Wed) RL)
3. Measurement of Ionizing Radiation . . . . . 6VL +2RL (Samant) (Week 1/24 – 1/28, Week 1/31 – 2/4) (2/2(Wed) RL, 2/9(Wed) RL )
4. Dose Distribution and Scatter Analysis. . . . .2VL+1RL (Liu) (Week 2/7 – 2/11) (2/16(Wed) RL )
5. Measurement of Absorbed Dose. . . . . 4VL+1RL (Li) (Week 2/7 – 2/11, Week 2/14 – 2/18) (2/21 (Mon) RL)

Midterm I: 1-5 (2/23(Wed))

### PART II: Classical Radiation Therapy

6. Orthovoltage calibration: TG61 and practice. . 3VL+1RL(Lu) (Week 2/28 - 3/4) (3/16(Wed) RL)
7. A System of Dosimetric Calculations . . . . .3VL +2RL (Liu) (Week 3/14 – 3/18) (3/21(Mon) RL, 3/23(Wed) RL)
8. Treatment Planning I: Isodose Distributions . . . .3VL+1RL (Kahler) (Week 3/21 – 3/25) (3/28 (Mon) RL)

Midterm II: 6-8 (3/30(Wed))

9. Treatment Planning II: Patient Data, Corrections, and Setup . . . . . 3VL+1RL (Kahler)(Week 4/4 – 4/8) (4/13(Wed) RL)
10. Treatment Planning III: Field Shaping, Skin Dose, and Field Separation . . . . 2VL+ 1RL (Kahler) (Week 4/11– 4/15) (4/20(wed) RL)

Final: 1-10 (4/25(Mon))

Notes: “VL” represent video lectures. “RL” represents Reflective Lectures”(Lab could be included)

### ATTENDANCE POLICY; CLASS EXPECTATIONS; MAKE-UP POLICY

**Attendance is required.** Penalties for each unexcused absence will be at the discretion of the Professor, up to a 2% deduction in cumulative average per unexcused absence. Please make arrangements for excused absences in advance. Graded homework is due no later than 5:00pm of the due date. After that, homework will not be eligible for grading unless accompanied by a doctor’s note.

**Students will be regularly assigned mandatory prior reading as part of class preparation.** : All assigned homework/ project must be completed. Extensions may only be given at the discretion of the instructor for *excused* absences. There are no make-up final examine; *excused* absences will permit points from missed graded events to be credited as a percentage of the Final Exam Grade. Unexcused absences will result in a zero on the missed graded event.

Excused absences must be consistent with university policies in the Graduate Catalog and require appropriate documentation:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>

### EVALUATION OF GRADES

Assignment	Total Points	Percentage of Final Grade
Homework and lab reports	100 each	15%
Quizzes	100 each	5%
Midterm Exam I	100	20%
Midterm Exam II	100	20%
Final Exam	100	40%

		<b>Total: 100%</b>
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## GRADING POLICY

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-
59 below	E

Note: grades *may* be curved based on the overall class performance

More information on UF grading policy may be found at: <http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

## STUDENTS REQUIRING ACCOMMODATIONS

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

## EVALUATIONS

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/>.

## UNIVERSITY HONESTY POLICY

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

## SOFTWARE USE

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

## STUDENT PRIVACY

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

## CAMPUS RESOURCES

Health and Wellness

### **U Matter, We Care**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

### **Counseling and Wellness Center**

352-392-1575; <http://www.counseling.ufl.edu/cwc>

### **Sexual Assault Recovery Services (SARS)**

352-392-1161; Student Health Care Center

### **University Police Department**

352-392-1111 (or 911 for emergencies); <http://www.police.ufl.edu/>

## **Academic Resources**

### **E-learning Technical Support**

352-392-4357 (select option 2); [learning-support@ufl.edu](mailto:learning-support@ufl.edu); <https://lss.at.ufl.edu/help.shtml>

### **Career Resource Center**

Career assistance and counseling.

352-392-1601; Reitz Union; <https://www.crc.ufl.edu/>

### **Library Support**

Various ways to receive assistance with respect to using the libraries or finding resources.

<http://cms.uflib.ufl.edu/ask>

### **Teaching Center**

General study skills and tutoring.

352-392-2010 or 352-392-6420; Broward Hall; <https://teachingcenter.ufl.edu/>

### **Writing Studio**

Help brainstorming, formatting, and writing papers.

352-846-1138; 302 Tigert Hall; <https://writing.ufl.edu/writing-studio/>

### **Student Complaints Campus**

[https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)

### **On-Line Students Complaints**

<http://www.distance.ufl.edu/student-complaint-process>