



# RON 211

## Introduction to Radiation Oncology Physics

**UCDAVIS**  
**HEALTH**

**COMPREHENSIVE  
CANCER CENTER**

# RON 211

## Introduction to Radiation Oncology Physics

### Syllabus

#### Course Description:

This course is aimed at physics/engineering graduate students and senior level undergraduate physics/engineering majors. Its purpose is to introduce these students to the field and profession of Medical Physics, with an emphasis on Therapy Physics. The students will experience the role of the medical physicist in an active, academic radiation oncology clinic, and will also be exposed to some areas of current therapy physics-related research. The student will gain an understanding of what medical physics is as a field and how physics is required and applied to radiation oncology.

This course offers 3 credits and consists of approximately 10 hours of didactic lecture and 60 hours of clinical activity over the course of the 10-week quarter. Clinical activity hours will be arranged with the course coordinator and the clinical staff. Some of the clinical activity must be completed during regular treatment hours, but some must be completed during off-hours when the physics staff has access to the treatment machines. The student will also give a seminar to the Radiation Oncology staff at the end of the quarter.

#### Grading:

Grading mode for this course is Satisfactory/Unsatisfactory. There are no formal examinations for this course. The grade will be decided by the course coordinator based on evaluation of student's involvement, his/her seminar presentation, and input from the other instructors.

#### Recommended Text:

- Gibbons JP. Khan's The Physics of Radiation Therapy (6<sup>th</sup> ed.), published by Lippincott Williams & Wilkins (Philadelphia); 2019.

#### Didactic Lectures:

The student will attend the didactic lectures given as part of the Radiation Oncology Resident Physics Course. S/he is also encouraged to attend the Radiation Biology Course lectures and the Clinical Didactic lectures.

## Clinical Activity:

Below is a sample list of activities and associated hours. The actual activities and hours spent can be modified based on the student's availability with permission of the course coordinator. The student should expect to spend 60 hours or more total on these activities. These activities need to be coordinated with the assigned staff/faculty.

- Observe CT-simulation. 3 hours
- Observe patient treatment on Elekta linacs. 3 hours
- Observe patient treatment on Tomotherapy. 3 hours
- Observe treatment planning for linacs and Tomo. 8 hours
- Observe monthly QA for one of the linacs. 8 hours
  - Safety and mechanicals checks
  - Output checks
  - MLC checks
  - Imaging checks
- Observe monthly QA for Tomo. 4 hours
- Observe monthly QA for Gamma Knife. 2 hours
- Observe monthly QA for HDR. 2 hours
  - Including new source only items
- Observe daily QA for one of the linacs. 0.5 hour
- Observe daily QA for the Tomo. 0.5 hour
- Observe patient-specific QA on linac. 2 hours
  - Measurement
  - Analysis/comparison of measured to calculated
- Observe patient-specific QA on Tomo. 2 hours
  - Measurement
  - Analysis/comparison of measured to calculated
- Observe HDR Tandem-and-Ring treatment. 4 hours
  - CT-simulation
  - Treatment planning
  - Daily QA
  - Patient treatment
- Observe Gamma Knife treatment. 6 hours
  - Mask making
  - Frame placement
  - Daily QA
  - Treatment planning
  - Patient treatment
- Observe calculation checks (2<sup>nd</sup> checks). 3 hours
- Observe weekly chart checks and fini chart checks. 4 hours
- Attend at least one Treatment Planning Conference. 1 hour 8:00 – 9:00 Thursday
- Attend at least one Chart Rounds. 2 hours 8 – 9 Tuesday
- Attend at least one Clinical Physics Meeting. 1 hour 2 – 3 Tuesdays

- Attend at least one Physics Journal Club Meeting. 1 hour usually around 4:30 – 5:30 Thursday (get schedule from Tina)

### Seminar:

The student will give a 20-40 minute seminar to the Radiation Oncology staff at the end of the quarter on a therapy physics-related topic of the student's choice. The topic must be approved by the course coordinator. The student will work with Radiation Oncology faculty and staff in preparing the seminar.

### Additional:

The student is encouraged to attend the following lectures, seminars, and conferences within the Radiation Oncology Department:

- Didactic physics lectures 7-8 Tuesday and Thursday
- Didactic clinical lectures 8-9 Monday and Wednesday
- Didactic radiation biology lectures 7-8 Friday
- Resident physics seminars usually Thursday afternoon (Tina)
- Chart rounds
- Treatment planning conference
- Physics journal club

### UCD Code of Academic Conduct:

The UCD Code of Academic Conduct is attached to this course description and can also be accessed at <http://sja.ucdavis.edu/files/cac.pdf>.

# The University of California, Davis

## CODE OF ACADEMIC CONDUCT

### Honesty, Fairness, Integrity



This Code of Academic Conduct exists to support high standards of behavior and to ensure fair evaluation of student learning. Students who violate the Code of Academic Conduct are subject to disciplinary sanctions that include censure, probation, suspension, deferred separation, or dismissal from the University of California. Unless specifically authorized by the instructor in writing, misconduct includes, but is not limited to the following:

- Academic misconduct on exams or other coursework
  - Copying or attempting to copy from another student, allowing another student to copy, or collaborating with another student on an exam
  - Displaying or using any unauthorized material such as notes, cheat-sheets, or electronic devices
  - Looking at another student's exam
  - Not following an instructor's directions regarding an exam
  - Talking, texting or communicating during an exam
  - Altering assignments or exams for re-grading purposes
  - Bringing pre-written answers to an exam
  - Having another person take an exam for you, or taking an exam for another student
  - Theft of academic work
  - Unexcused exit and re-entry during an exam period
- Plagiarism
  - Taking credit for any work created by another person; work includes, but is not limited to books, articles, experimental methodology or results, compositions, images, lectures, computer programs, or internet postings
  - Copying any work belonging to another person without indicating that the information is copied and properly citing the source of the work
  - Using another person's presentation of ideas without putting such work in your own words or form and giving proper citation
  - Creating false citations that do not correspond to the information you have used
  - Plagiarizing one's own work
- Unauthorized collaboration
  - Working together on graded coursework without permission of the instructor
  - Working with another student beyond the limits set by the instructor
  - Providing or obtaining unauthorized assistance on graded coursework
- Misuse of an instructor's course materials or the materials of others
  - Posting or sharing any course materials of an instructor without the explicit written permission of that instructor
  - Purchasing or copying assignments or solutions, to complete any portion of graded work, without the instructor's permission
  - Unauthorized use of another student's work
- Lying or fraud
  - Giving false excuses to obtain exceptions for deadlines, to postpone an exam, or for other reasons
  - Forging signatures or submitting documents containing false information
  - Making false statements regarding attendance at class sessions, requests for late drops, incomplete grades, or other reasons
- Intimidation or disruption
  - Pressuring an instructor or teaching assistant to regrade work, change a final grade, or obtain an exception such as changing the date of an exam, extending a deadline, or granting an incomplete grade
  - Refusing to leave an office when directed to do so
  - Physically or verbally intimidating or threatening an instructor, teaching assistant or staff person, including yelling at them, invading personal space, or engaging in any form of harassment
  - Repeatedly contacting or following an instructor, teaching assistant, or staff person when directed not to do so
  - Misusing a classroom electronic forum by posting material unrelated to the course
  - Interfering with an instructor's or teaching assistant's ability to teach a class, or interfering with other students' participation in a class by interrupting, physically causing a disruption, or excessive talking

## Upholding the UC Davis Code of Academic Conduct

Students, faculty, and University administration all have a role in maintaining an honest and secure learning environment at UC Davis.

- The success of our Code of Academic Conduct depends largely on the degree that it is willingly supported by students. Students:
  - Are responsible to know what constitutes cheating. Ignorance is not an excuse.
  - Are required to do their own work unless otherwise allowed by the instructor.
  - Are encouraged to help prevent cheating by reminding others about this Code and hold each other accountable by reporting any form of suspected cheating to the University.
  - Shall respect the copyright privileges of works produced by faculty, the University, and other copyright holders.
  - Shall not threaten, intimidate, or pressure instructors or teaching assistants, or interfere with grading any coursework.
  - Shall not disrupt classes or interfere with the teaching or learning environment.
  
- Faculty members and instructors are responsible for teaching courses and evaluating student work, and are governed by University of California and UC Davis policies and regulations. Regulation 550 of the Davis Division of the Academic Senate addresses academic misconduct. Faculty and instructors:
  - Will provide students with a course outline containing information about the content of the course, amount and kind of work expected, examination and grading procedures and notice of the Code of Academic Conduct.
  - Should monitor examinations to help prevent academic misconduct.
  - Shall report all suspected cases of cheating and other misconduct to the Office of Student Support and Judicial Affairs (<http://ossja.ucdavis.edu/>).
  
- The University has delegated authority and responsibility to the Office of Student Support and Judicial Affairs (OSSJA) for the adjudication and resolution of academic misconduct cases. OSSJA maintains records of academic misconduct. The University:
  - Shall educate faculty and students about the Code of Academic Conduct.
  - Shall provide physical settings such as classrooms and labs for examinations that minimize opportunities for academic misconduct.
  - Shall assist and train faculty and teaching assistants about how to prevent and address academic misconduct.
  
- Submitting Reports and Judicial Procedures:
  - The Code of Academic Conduct governs academic conduct at UC Davis.
  - Faculty have sole authority, as granted by the Academic Senate, to evaluate a student's academic performance and assign grades. If academic misconduct is admitted or established, instructors may assign a grade penalty no greater than "F" for the course in question. If a report is pending at the end of an academic term, instructors should assign a temporary grade of "Y" for the course until the report is resolved.
  - A faculty/student panel, convened by OSSJA, shall conduct formal hearings to adjudicate contested cases of academic misconduct, unless the right to a formal hearing has been withdrawn. The right to a formal hearing may be withdrawn because of a prior finding of misconduct.
  - Instructors and teaching assistants may direct a student to leave a class immediately if the student's behavior is disruptive.
  - Instructors, teaching assistants, and staff persons should contact police (752-1230 or 911) if they feel physically threatened.