RADI 6031

Physics Measurements in Radiotherapy I

Fall 2018

CLASS DAYS and TIME: Friday (2:00 – 5:00pm)

CLASSROOM: CTRC Building - Grossman Plaza (U212)

COURSE FACULTY: Sotiri Stathakis, Ph.D., M.S.

OFFICE LOCATION and HOURS: By Appt. Office: G238

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READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.

COURSE DESCRIPTION AND OBJECTIVES

This course allows the students to gain didactic familiarity with the guidelines recommended by the American Association of Physicists in Medicine. The students will study the Task Group reports and present them in class followed by a question-answer session. Hands on practicum will also be available for selected Task Group reports.

Pre-requisites – RADI 5005, RADI 6030

Semester credit hours – 3

By the end of this course, each student should be able to:

- Understand the basic principles of radiation therapy.
- Understand the AAPM recommendations on radiation therapy systems
- Implement AAPM TG recommendations independently.

COURSE ORGANIZATION

The main teaching modalities used in this course include:

1) Conventional didactic lectures

2) Classroom discussion

3) Supplement reading material

Materials – See below

Computer Access – Many of the presentations are given in the common lecture format and are accompanied by Pdf converted PowerPoint slide files. You are responsible for all information included in the lecture materials. However, you should not assume that all testable lecture material is found only in the posted materials. That is, lectures may be expanded and enhanced during in-class presentations. So, take good notes because any information discussed in class is considered testable.

Reading Assignments – Required reading assignments are posted in the schedule of class meetings (shown below) and are never considered optional. Unless specifically noted by the instructor, anything in the required readings, whether emphasized in class or not, is considered testable on exams. Mandatory readings are primarily found in the required text

book (see below). However, occasionally a reading assignment will be given that is posted online or sent to you via email attachment.

ATTENDANCE

In order to achieve the expected level of competency, students must be fully engaged. Therefore, attendance for every class session is expected. It is recognized that a student may occasionally arrive late to class due to unexpected traffic problems or inclement weather. However, chronic lateness is considered an unprofessional behavior that disrupts the learning environment for everyone else in the classroom.

TEXTBOOKS

Required: AAPM TG reports as listed below

Recommended: F. Khan, *The Physics of Radiation Therapy*, 4th Edition and E.B. Podgorsak, *Radiation Oncology Physics: A Handbook for Teachers and Students*

GRADING POLICIES AND EXAMINATION PROCEDURES

Testable material comes from 3 main sources: Lecture presentation, reading assignments and in class discussion. Final letter grades will be based on weekly multiple choice exams and a final written multiple choice exam. Weekly exams account for 65% of the grade and the final exam for 35%

Late Arrival to Exams: Exams will be timed. If you arrive late to an exam, and are given permission to take the exam, you will not be given additional time to complete your test. If you arrive after another student has finished the exam and has departed the exam room, you will not be allowed to take the exam. If you miss an exam, you may be elgible for taking a make-up exam.

Make-up Examinations: A student who must miss a scheduled exam for a serious reason must request an excused absence from the Course Director. Acceptable "serious reasons" usually involve serious illness or injury to the student (doctor's excuse may be required) or the student's family member. Examples of unacceptable reasons include: Not prepared or incomplete studying, over-sleeping, hangover, heavy traffic or any travel delays, other appointments or scheduled professional or personal commitments.
If it is determined that missing an exam is justified, a make-up examination will be scheduled. The make-up exam will be given as soon as possible at a time designated by the Course Director. Any student who misses an exam and does not receive an excused absence **will receive a grade of zero for that exam**.

Grading System

Include a grading scale used to determine final grades, see example below

A = 90-100% B = 80-89% C = 70-79% F = < 69%

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at http://uthscsa.edu/eeo/request.asp.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/

TITLE IX AT UTHSCSA

Title IX Defined:
Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance."

University of Texas Health Science Center San Antonio's Commitment:
University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at http://students.uthscsa.edu/titleix/

EMAIL POLICY

Every student is issued a University e-mail address and account at the time of enrollment. As a matter of University Policy, communications between students and faculty that occur using the student's University e-mail address is considered official business. Therefore, students are expected to check their university email inboxes on a regular basis so that any announcements, instructions, or information regarding this course will be received in a timely way. Missed communications due to inadequate monitoring of incoming emails on the University's email server will never be a valid excuse for unsatisfactory academic progress.

USE OF RECORDING DEVICES

Recording of lectures and other learning activities in this course by any means (*e.g.*, video, audio, etc.) is only permitted if approved by the instructor or required for compliance with Americans with Disabilities Act (ADA).

ELECTRONIC DEVICES

Cell phones must be turned off during all class meetings and exams. Computers and electronic tablets are allowed only for participating in classroom activities (*e.g.*, viewing slides presented in lecture or conference materials). No texting, tweeting, emailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

TENTATIVE CLASS SCHEDULE
RADI 5025
Radiation Biology & Molecular Oncology
Fall 2016

WEEK	DATE	TOPIC
Week 1		Introduction
Week 2	TG-51 - Protocol for Clinical Dosimetry of High-Energy Photon and Electron Beams - BET TG-39 - The Calibration and Use of Plane-Parallel Ionization Chambers for Dosimetry of Electron Beams	
Week 3	TG-71 - Monitor unit calculations for external photon and electron beams TG-40 - Comprehensive QA for Radiation Oncology	
Week 4	TG-142 - Quality assurance of medical accelerators TG-106 - Accelerator beam data commissioning equipment and procedures	
Week 5	TG-137 - AAPM recommendations on dose prescription and reporting methods for permanent interstitial brachytherapy for prostate cancer Dose Calculation for Photon-Emitting Brachytherapy Sources with Average Energy Higher than 50 keV (RPT229)	
Week 6	Report of the Task Group 186 on model-based dose calculation methods in brachytherapy beyond the TG-43 formalism: Current status and recommendations for clinical implementation TG-53 - Quality Assurance for Clinical Radiotherapy Treatment Planning	
Week 7	TG-50 - Basic Applications of Multileaf Collimators TG-62 - Diode in Vivo Dosimetry for Patients Receiving External Beam Radiation Therapy	
Week 8	TG 147 - Quality assurance for nonradiographic radiotherapy localization and positioning systems TG-58 - Clinical Use of Electronic Portal Imaging	
Week 9	TG-119 - IMRT commissioning: Multiple institution planning and dosimetry comparisons TG-201 - Information technology resource management in radiation oncology	
Week 10	TG-159 - Recommended ethics curriculum for medical physics graduate and residency program Rpt-98 - Report of the AAPM Low Energy Brachytherapy Source Calibration Working Group: Third-party brachytherapy source calibrations and physicist responsibilities	
Week 11	TG-154 - Quality assurance of U.S.-guided external beam radiotherapy for prostate cancer TG-105 - Issues associated with clinical implementation of Monte Carlo-based photon and electron external beam treatment planning	

Week 12	**TG 176 - Dosimetric effects caused by couch tops and immobilization devices** **Radiation Safety Officer Qualifications for Medical Facilities**
Week 13	**ICRU 83 Prescribing, Recording, and Reporting Photon-Beam Intensity-Modulated Radiation Therapy** **ICRU 76 Measurement Quality Assurance for lonizing Radiation Dosimetry**
Week 14	**Lab on TG142 Mechanical QA for Linac**
Week 15	**Lab on TG51**
Week 16	**Final Exam**