

RADI 6043
Clinical Imaging Physics Rotation 4
Spring 2018

CLASS DAYS and TIME: Monday – Friday 8:00 a.m. – 5:00 p.m.

CLASSROOM: CTRC Building – Radiation Oncology Clinic

COURSE FACULTY: Andrew Sampson, Ph.D., Geoffrey Clarke, Ph.D.

OFFICE LOCATION and HOURS: By Appt. Office: G242

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

COURSE DESCRIPTION AND OBJECTIVES

The first clinical rotation is designed to give an introduction and an overview of all the clinical processes and the basic safety training. In detail the student will cover the following topics: employee orientation, radiation oncology orientation, HIPAA training, introduction to radiation protection, introduction to nursing and introduction to simulation, introduction to LINACs, LINAC QA and warm up, monitor unit calculations, electronic medical records orientation, regulations and professional recommendations.

Pre-requisites – Completion of Year 1 & 2 and has passed the Core Knowledge Exam

Semester credit hours – 12

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

- Understand the Radiation Process.
- Describe the simulation process, purpose of simulation and why the data is important for accurate patient treatment.
- Describe the LINAC treatment process, dose rates and MLS structure available on each LINAC, LINAC QA, and have a working knowledge of QA equipment.
- Understand electronic medical records and have a working knowledge of MOSAIQ.
- Demonstrate ability to accurately perform MU calculations for conventional SSD and SAD treatments.

COURSE ORGANIZATION

The student is assigned a mentor from the physics staff and performs clinical tasks under the mentor's direct supervision. A rotation is considered complete when all rotation assessments have been signed off by the mentor and student.

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 assigned throughout the rotations. Unless specifically noted by the instructor, anything in the required readings, whether emphasized in class or not, is considered testable on exams.

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: [Click here to enter text.](#)

GRADING POLICIES AND EXAMINATION PROCEDURES

A rotation is considered complete when all rotation assessments have been signed off by the mentor and student. Failure to complete a rotation or unsatisfactory progress in a rotation will be reviewed by the DMP Committee on Graduate Studies (COGS). The student will be notified in writing of their probationary status and will be given a plan for remediation.

Secure a passing grade for twenty one (21) monthly written exams on the assigned topics that will be covered during each rotation. Each exam is two hours long, and has up to 50 multiple choice questions. Passing grade is considered to be a score above 70%. In case of a failing exam grade, a second exam will be given within 7 days. After a second failed attempt, the student will be given a plan for remediation that has to be completed before the next examination.

Complete a comprehensive oral examination every 6 months. Oral examinations are considered complete when the oral evaluation form has been signed by the appropriate faculty mentor and student. A minimum of two faculty members must be present during the examination or else the examination will be rescheduled.

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/eoo/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.

Objectives Master Checklist - RAD1 6043
Clinical Therapy Rotation 4
Spring 2018

Activity
Safety in the Radiology Clinic
CT Facility Shielding Design
Safety in the MRI suite
Introduction to Radiation Protection. Resident is able to: <ul style="list-style-type: none"> A) Perform a facility shielding design for an x-ray CT suite. B) Describe several strategies to minimize patient radiation exposure in FDG-PET-CT studies. C) Perform a conceptus dose calculations for a typical radiographic and CT examinations. D) Describe the facility design and shielding considerations for MRI. E) Fringe Fields - measurement, scanner and console room safety precautions
Imaging Informatics. Resident is able to: <ul style="list-style-type: none"> A) Explain how computer aided diagnosis is and how it is used to enhance patient care. B) Explain how three-dimensional multi-planar reformatting is done and how it is used clinically. C) Explain what image fusion is and how it is used clinically.
Advanced Image Processing. Resident is able to: <ul style="list-style-type: none"> A) Explain how maximum intensity projections (MIP) are produced. B) Explain the basic concepts of iterative reconstruction for tomographic systems. C) Describe open source software packages and how they can be used for image assessment .
Advanced Computed Tomography Imaging. Resident is able to: <ul style="list-style-type: none"> A) Explain the clinical applications of CT fluoroscopy. B) Describe the facility's procedures for CT protocol development (image quality vs. dose). C) Describe how to determine slice sensitivity profile for various CT protocols.
Advanced Magnetic Resonance Imaging. Resident is able to: <ul style="list-style-type: none"> A) Explain the trade-offs between SNR and imaging speed in partially parallel MR imaging. B) Describe how to carry out MR angiography, with and without exogenous contrast. C) Describe features of 1H-NMR brain spectra and identify the peaks in a brain MRS spectrum..
MRI system performance calculations. Resident is able to: <ul style="list-style-type: none"> A) Characterize Specific Absorption Rate (SAR) in accordance with NEMA MS 8-2008. B) Explain how to make Acoustic Noise Measurements in MRI Systems per NEMA MS 4-2010.
Electronic Medical Records. Resident can explain how the RIS system is used, explain what the DICOM 3.0 standard is, and what DICOM "capabilities", "objects" and "attributes" are.
Regulations and Professional Recommendations: Can explain what the Code of Federal Regulations, Title 10, Part 20 and Title 21, Part 1020 cover.
Professional Organizations: Resident is aware of the history of AAPM, ACR, and RSNA and the roles that these organizations (and their local chapters) play in the professional discipline of medical physics.
Student can explain the basic rights of patients to personal privacy and medical record confidentiality.
Student can explain the main principles and practices used to avoid conflicts of interest.
Student Exhibits a comprehensive understanding of appropriate behavior in personal behavior at work and in employee relationships.

Advanced Nuclear Medicine Physics. Resident is able to:
Resident has performed patient release calculations.
NEMA NU 1-2012. Student performs spatial resolution, spatial linearity & energy resolution.
NEMA NU 1-2012 . Student has a thorough understanding of QA procedures collimators for spatial resolution w/o scatter, spatial resolution w/ scatter, planar sensitivity, collimator penetration.
Demonstrate an understanding of the considerations required to complete shielding calculations for nuclear medicine facilities.
Explain methods and pitfalls of displaying hybrid images on PET/CT and SPECT/ CT systems.
Explain NEMA NU 2-2007 methods and standards for PET system performance measurements.
Define what an SUV is and explain what it is used for.