

Advanced Radiation Therapy Physics Spring 2021

COURSE INFORMATION:

Course name	RADI 6650-201
Credit Hours	3 Credit Hours
Times and Location	Wed, 6:30 – 9:20 pm; Online Zoom Link: https://uml.zoom.us/j/93135191618
Textbook	The Physics of Radiation Therapy, by Faiz M Khan. Lippincott Williams & Wilkins. ISBN 978-0-781-78856-4 AAPM Task Group (TG) Reports are found at http://www.aapm.org/pubs/reports/ (Pertinent TG reports will be posted on blackboard)
Course contact	lasana@globalhealthcatalysts.org

COURSE DESCRIPTION:

The student will be introduced to the fundamental physics of advanced treatment techniques used in radiation therapy, which include external beam electron, proton, and photon therapy and brachytherapy. For these techniques, the basic principles of the techniques such as clinical applications, radiation delivery equipment, treatment planning methods, methods of dose calculations, determination of time of irradiation from dose prescription, dose measurements, and quality assurance will be studied. This knowledge will prepare the student for an introduction to the clinical practice of medical physics applied to complex treatment techniques used in radiation therapy. Also, this should help prepare the student for research in radiation therapy physics.

INSTRUCTIONAL METHODOLOGIES:

Learning activities will include Online Lectures, Online course work, interactive lecture demos, reading assignments, self-directed learning, classroom/online discussion as well as homework exercises, quizzes, tests and exams, clinical visits/labs. Students are expected to read the textbook before class, and participate by asking and responding to questions during class. There will also be regular homework, as well as quizzes and exams to assess student progress.

Tentative Course Schedule (Spring 2021):

Date	Lecture/Topic	Comment
Jan 27	Introduction and course overview Introduction to Blackboard	
Feb 3	Image Guided Radiotherapy (IGRT):CT/Ultrasound, Image Guided Treatment Planning- CT, PET, MRI Image Guided Therapy- Planar Imaging	Assignment 1 due
Feb 10	Electron and Charged Particle Therapy: Intraoperative Electron Therapy Total Skin Electron Irradiation Mixed Beam Therapy- Craniospinal Irradiation Mixed Beam Therapy- Total Scalp Irradiation	Quiz 1 Assignment 2 due

Feb 17	Electron and Charged Particle Therapy: Recitation	Quiz 2 Assignment 3 due
Feb 24	Photon Therapy: Intensity Modulated Radiotherapy, Stereotactic Irradiation. Gated Radiotherapy; Total Body Irradiation	Quiz 3 Assignment 4 due
March 3	Photon Therapy Review	Quiz 4 Assignment 5 due
March 10	Test 1	
March 17	Brachytherapy: Prostate Brachytherapy; High Dose Rate Brachytherapy: Mammosite Brachytherapy (Breast) Intravascular Brachytherapy (Heart)	Quiz 5 Assignment 6 due
March 24	Brachytherapy recitation and practice	Quiz 6 Assignment 7 due
March 31	Proton beam Therapy	Quiz 7 Assignment 8 due
April 7	Proton Beam Therapy: Recitation and Review for test 2	Quiz 8 Assignment 9 due
April 14	Test 2	
April 21	CLINIC/Task group reports	Quiz 9 Assignment 10 due
April 28	FINAL EXAM REVIEW and Advance Radiation Therapy project presentations	Last day of classes
May 08	Final exam	