IMPORTANT: This syllabus form should be submitted to OAA (gsbs_academic_affairs@uth.tmc.edu) a week before the start of each semester.

NOTE to STUDENTS: If you need any accommodations related to attending/enrolling in this course, please contact one of the Graduate School's 504 Coordinators, Cheryl Spitzenberger or Natalie Sirisaengtaksin. We ask that you notify GSBS in advance (preferably at least 3 days before the start of the semester) so we can make appropriate arrangements.

Term and Year: **Spring 2023** Course Number and Course Title: **GS02 1103: Intro to Medical Physics II: Medical Imaging** Credit Hours: **3** Meeting Location: **MDA Faculty Center** Building/Room#**: FCT14.5059** WebEx/Zoom Link: **Will provide when classes start**	**Program Required Course: Yes** **Approval Code: Yes** **(If yes,** the Course Director or the Course Designee will provide the approval code.) **Audit Permitted: No** Classes Begin: **January 9, 2023** Classes End: **April 28, 2023** Final Exam Week: **May 3, 2023**

Class Meeting Schedule

Day	Time
M-W-F	**11:00 am – 12:00 noon**

Course Director Name and Degree: **Xiujiang John Rong, PhD** Title: **Professor** Department: **Imaging Physics** Institution: *MDACC* Email Address: Joh.Rong.@mdanderson.org Contact Number: 713-745-1365 **Course Co-Director/s:** Name and Degree: **N/A** Title: Department: Institution: *UTH* *MDACC* Email Address: Contact Number:	**Instructor/s** 1. **Moiz Ahmad, PhD** Institution: MDACC Email Address: MAhmad@mdanderson.org 2. **Frank Dong, PhD** Institution: MDACC Email Address: FDong1@mdanderson.org 3. **William Geiser, MS** Institution: MDACC Email Address: WGeiser@mdanderson.org 4. **Xinming Liu, PhD** Institution: MDACC Email Address: XLiu@mdanderson.org

NOTE: Office hours are available by request. Please email me to arrange a time to meet.

Teaching Assistant: (if any)

N/A
Name and Email Address

5. **John Rong, PhD**
   Institution: MDACC
   Email Address: John.Rong@mdanderson.org

6. **Janet Ching-Mei Feng, PhD**
   Institution: UT Health/UT Medical School
   Email Address: Ching.Mei.Feng@uth.tmc.edu

7. **Megan Jacobsen, PhD**
   Institution: MDACC
   Email Address: MCJacobsen@mdanderson.org

8. **Cayla Zandbergen, PhD**
   Institution: MDACC
   Email Address: CAWood@mdanderson.org

Course Description:

This course includes the production of x-rays, conventional x-ray radiography, fluoroscopy, mammography as well as digital x-ray imaging modalities, computed tomography, and picture archiving and communication systems (PACS). It covers the basic principles of medical imaging physics, the fundamental characteristics of each imaging modality, the major components of medical imaging systems, the principles of image formation and reconstruction, the attributes used to assess the performance and image quality of an imaging system, and radiation dosimetry in diagnostic imaging.

Textbooks

- **The Essential Physics of Medical Imaging, 4th edition, Bushberg, et al, Wolters Kluwer, 2021.**
- **ISBN: 978-1975-1-0322-4, $199.99**

Course Objective/s:
Upon successful completion of this course, students will understand the basic principles of medical x-ray imaging physics, imaging technologies, systems, and acquire hands-on experiences including radiography, mammography, and computed tomography.

***Specific Learning Objectives*:**

1. Understand the basic principles of medical imaging physics and describe the fundamental characteristics of each imaging modality.

2. Identify the major components of medical imaging systems, describe the basic design of imaging technology, and explain the principles of image formation and reconstruction.

3. Identify and describe the attributes used to assess the performance/image quality of an imaging system.

4. Understand how image quality and patient radiation dose are affected by x-ray interactions.

5. List the image acquisition parameters, and explain how each affects the image quality and/or patient radiation dose.

Student Responsibilities and Expectations:
Students enrolled in this course will be expected to perform the following activities:

1. Attend classroom lectures
2. Participate in hands-on labs
3. Participate in and contribute to course discussions during lecture, review sessions, and hands-on labs
4. Study course materials (e.g. textbook, lecture slides, lab instructions, literatures)
5. Complete course assignments (e.g. homeworks, projects, lab reports) on time
6. Prepare for and take examinations

Students are expected to complete all assigned reading material (e.g. textbook chapters, lab instructions) prior to class/lab. While you may work and discuss all course materials and assignments in groups, all writing assignments must be your own. Plagiarism and failure to properly cite scientific literature and other sources will not be tolerated and are grounds for dismissal from the course and further GSBS disciplinary action. Cheating or engaging in unethical behavior during examinations will be grounds for dismissal from the course without credit and further GSBS disciplinary action.

Grading System: **Letter Grade (A-F)**

Student Assessment and Grading Criteria : *(May include the following:)*

Percentage	Description
Homework (15-18%)	Assigned by the individual instructor as needed
Quiz (1-3%)	Assigned by the individual instructor as needed
Presentation (0%)	Assigned by the individual instructor as needed

Midterm Exams (~60%)	3 exams total, no final exam
Final Exam (%)	NA
Workshop or Lab (~20-25%)	5 Hands-on labs
Participation and/or Attendance (0%)	Students are required to attend the entire class.

JR/jal