**College of Medicine**
Department of Radiology
Medical Physics Graduate Program

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# ENU 6652
# Diagnostic Radiological Physics II (Physics of CT and Ultrasound)

## Spring 2020

**Instructors:** Manuel Arreola, PhD (arreom@radiology.ufl.edu)
Lynn Rill, Ph.D. (rillln@radiology.ufl.edu)
Stephanie Leon, PhD (leons@radiology.ufl.edu)

**TA:** Catherine Olguin, M.S. (carcat@radiology.ufl.edu)

**extbooks:** *The Essential Physics of Medical Imaging, 3rd Edition*, by Bushberg, Seibert, Leidholdt Jr. and Boone. Lippincott, Williams & Wilkins Publishers, Baltimore, MD (2011).(*Required)*

**Lectures:** 9:30-10:45 Tuesdays and Thursdays
Room C2-33

**Demonstration Labs:** TBA

| Date | Topic | Instructor |
|---|---|---|
| Tuesday, Jan 7 | Laminar Tomography | Arreola |
| Thursday, Jan 9 | Basics of X-Ray Cross-Sectional Imaging | Arreola |
| Tuesday, Jan 14 | CT Algebraic and Simple Back-Projection Reconstruction Algorithms | Arreola |
| Thursday, Jan 16 | Filtered Back-projection, Fourier Transforms and Kernels (Part 1) | Arreola |
| Tuesday, Jan 21 | Filtered Back-projection, Fourier Transforms and Kernels (Part 2) | Arreola |
| Thursday, Jan 23 | Sequential and Helical Scanners | Arreola |
| Tuesday, Jan 28 | Narrow and Broad-beam Multi-slice Scanners | Arreola |
| Thursday, Jan 30 | Image Quality in CT/ Instrumentation (Part 1) | Arreola |
| Tuesday, Feb 4 | CT Demo Lab 1: Image Quality | OLguin |
| Thursday, Feb 6 | EXAM 1 | |
| Tuesday, Feb 11 | Image Quality in CT/ Instrumentation (Part 2) | Arreola |
| Thursday, Feb 13 | CT Dose Indicators: CTDI, DLP and SSDE (Part 1) | Arreola |
| Tuesday, Feb 18 | CT Dose Indicators: CTDI, DLP and SSDE (Part 2) | Arreola |
| Thursday, Feb 20 | CT Demo Lab 2: CT Dose | Olguin |
| Tuesday, Feb 25 | Iterative Reconstruction Algorithms | Arreola |
| Thursday, Feb 27 | Cardiac CT | Arreola |

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| Tuesday, Mar 3 | No class – UF Spring Break | |
| Thursday, Mar 5 | No class – UF Spring Break | |
| Tuesday, Mar 10 | Dual Energy CT/ CTA and CT Perfusion | Olguin/Arreola |
| Thursday, Mar 12 | CT Artifacts and Clinical Examples | Arreola |
| Tuesday, Mar 17 | Joint Commission and ACR Compliance in CT | Arreola |
| Thursday, Mar 19 | EXAM 2 | |
| Tuesday, Mar 24 | Fetal dose calculations in Radiology 1 | Leon |
| Thursday, Mar 26 | Fetal dose calculations in Radiology 2 | Leon |
| Tuesday, Mar 31 | US1: Basic Acoustics and Transducers | Rill |
| Thursday, Apr 2 | US2: Pulsed Ultrasound and Image Formation | Rill |
| Tuesday, Apr 7 | US3: Imaging modes: multi-frequency, harmonics, Doppler | Rill |
| Thursday, Apr 9 | Demo Lab: US QC (in class) | Rill |
| Tuesday, Apr 14 | US4: US Image Quality and QC | Rill |
| Thursday, Apr 16 | US5: US Artifacts and Newer US techniques | Rill |
| Tuesday, Apr 23 | EXAM 3 | |

**Policies:**

***Examinations:*** As indicated, times TBA

***Course Grade:*** Will be calculated as follows:

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|---|---|
| Graded homework assignments: | 10% |
| Exam 1 | 30% |
| Exam 2 | 30% |
| Exam 3 | 30% |

***Grading Scale:*** 93-100 A; 90-92 A-; 86-89 B+; 83-85 B; 80-82 B-; 76-79 C+; 73-75 C; 70-72 C-
Grades will be curved

***Office Hours:*** By appointment

***Academic Honesty:*** All students are required to abide by the University's honesty policy as published in UF Rule 6Cl-4.0l7. Students should be familiar with the entire rule which can be reviewed at: http://www.aa.ufl.edu/aa/Rules/4017.htm and specifically addresses cheating;

***Cheating****: The improper taking or tendering of any information or material which shall be used to determine academic credit. Taking of information includes, but is not limited to, copying graded homework assignments from another student; working together with another individual(s) on a take-home test or homework when not specifically permitted by the teacher; looking or attempting to look at another student's paper during an examination; looking or attempting to look at text or notes during an examination when not permitted. Tendering of information includes, but is not limited to, giving your work to another student to be used or copied; giving someone answers to exam questions either when the exam is being given or after having taken an exam; giving or selling a term paper or other written materials to another student; sharing information on a graded assignment.*

***Class Attendance:*** Students are expected to attend each class period. Periods which may be missed should be brought to the attention of the Instructor as far in advance of the class period as possible. In the

event of an unexcused absence, it is the student's responsibility to obtain and review the material that was covered during that class period. Students must participate in each laboratory exercise.

***Make-up Labs & Assignments:*** Make-up laboratory exercises and assignments will only be considered for exceptional circumstances and will be implemented by the instructor on a case-by-case basis.

***Class Demeanor:*** Class distractions such as cell phones and pagers are unacceptable. Students will ensure that any such devices that are brought into the classroom will be turned off, or operated in a silent mode, during the class period.

***Students w/ Disabilities:*** Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.