FA18 RADI 5015-001 Phys Of Diag Imaging 1

Jump to Today ✎ Edit

CLASS DAYS and TIME: Mon/Wed 10:00-11:30 am

CLASSROOM: MED 625F (Radiology Classroom)

COURSE FACULTY: Andrew J. Sampson, Ph.D., DABR

OFFICE LOCATION and HOURS: MED 625F, Mon/Wed 11:30 am - 12:00 am

EMAIL: sampsona@uthscsa.edu (mailto:sampsona@uthscsa.edu)

TELEPHONE: 210-567-0655

Course Description and Objectives

This is a laboratory-style course designed to provide an introduction to performing routine measurements related to system quality assurance (QA), characterization, and acceptance testing of medical imaging equipment.

Pre-Requisites: None

Semester Credit Hours: 2 CU

Course Organization

The main teaching modalities used in this course include:

1. **Auditory activities:** listening to oral presentations
2. **Visual activities:** reading assignments, watching instructional videos, demonstrations, presentations (including interpretation of graphs and tables)
3. **Tactile/Kinesthetic:** Solving problems, participating in term projects

Computer Access

Students are required to bring a wifi-enabled laptop for working through labs and collecting and recording data.

Attendance

Attendance is mandatory. Students are expected to advise the instructor in advance if they will not be able to attend a class session. Missing quizzes and exams require prior approval and rescheduling.

Textbook

The required texts for this class are included in the CANVAS Files section for this class. There is no textbook to purchase.

Grading Policies and Examination Procedures

Grading Breakdown: Report = 80%, Final/Oral Exam = 20%

Grading System

A = 90-100% B = 80-89.9% C = 70-79.9% F= <70%

Requests for Accommodations 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 *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 (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/scholasticdishonestypolicy/ (http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/scholasticdishonestypolicy/)**

Title IX at UTHSCSA

Title IX Defined:

Title of 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/ (http://students.uthscsa.edu/titleix/)**

Email Policy

None

Use of Recording Devices

Permitted for personal use only

Electronic Devices

Electronic devices are permitted as long as they do not become a distraction for the class. It is requested that personal, non-emergency, communication is limited to hours outside of class instruction time.

Course Description and Objectives

An introduction to the theory and applications of diagnostic imaging systems, including radiographic, fluoroscopic, ultrasound, and molecular imaging systems.

Pre-Requisites: None

Semester Credit Hours: 3 CU

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

- Apply the fundamental knowledge of physics to understanding the basics of radiological imaging processes.
- Discuss the concepts underlying various technologies used for medical imaging.
- Recount clinical and research applications of each medical imaging modality covered in the course.

Course Organization

The main teaching modalities used in this course include:

1. **Auditory activities:** listening to oral presentations
2. **Visual activities:** reading assignments, watching instructional videos, demonstrations, presentations (including interpretation of graphs and tables)
3. **Tactile/Kinesthetic:** Solving problems, participating in term projects

Computer Access

Students are required to bring a wifi-enabled laptop in order to take online quizzes and exams.

Attendance

Attendance is mandatory. Students are expected to advise the instructor in advance if they will not be able to attend a class session. Missing quizzes and exams require prior approval and rescheduling.

Textbook

Required: The Essential Physics of Medical Imaging, 3rd Edition, 2012, by JT Bushberg, JA Seibert, EM Leidholdt, Jr, and JM Boone

The required texts for this class are included in the CANVAS Files section for this class. There is no textbook to purchase.

Grading Policies and Examination Procedures

Grading Breakdown: Homework 60%; Quizzes = 20%, Comprehensive Final Exam = 20%

Grading System

A = 90-100% B = 80-89.9% C = 70-79.9% F= <70%

Homework Protocol

Students are encouraged to work cooperatively on the homework problems; however, plagiarism of another student's work **will not** be tolerated. Homework sets shall be submitted on the date due. Homework problem sets submitted up to a week late will receive a 50% reduction in grade. Homework sets received more than one week late will receive a grade of 0.

Examination Protocol

Exams may be composed of multiple-choice questions. Certain questions will be accompanied by images, so it is imperative that you study images (particularly those presented in class).

No books, backpacks, etc. are permitted in the testing area. Hats must be removed. You will not be allowed to ask questions of the proctor once the examination has started (except to point out potential typographical errors in the exam).

Late Arrival to Exams - Exams will be times. 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.

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 of 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 examination is justified, a make-up exam 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.

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Email Policy

E-mail is allowed

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Electronic Devices

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Course Summary:

Date	Details	
Mon Aug 20, 2018	Lecture 1: Introduction/Radiation & the Atom (https://uthscsa.instructure.com/calendar?event_id=69144&include_contexts=course_20728)	10am to 11:30am
Wed Aug 22, 2018	Lecture 2: Interaction of Radiation with Matter (https://uthscsa.instructure.com/calendar?event_id=69145&include_contexts=course_20728)	10am to 11:30am
Mon Aug 27, 2018	Lecture 3: Radiographic Image Quality - Part 1 (https://uthscsa.instructure.com/calendar?event_id=69146&include_contexts=course_20728)	10am to 11:30am
Wed Aug 29, 2018	Lecture 4: Radiographic Image Quality - Part 2 (https://uthscsa.instructure.com/calendar?event_id=69147&include_contexts=course_20728)	10am to 11:30am
Wed Sep 5, 2018	Lecture 5: Medical Imaging Informatics (https://uthscsa.instructure.com/calendar?event_id=69148&include_contexts=course_20728)	10am to 8:30pm
Mon Sep 10, 2018	Lecture 6: Production and Creation of Radiographs (https://uthscsa.instructure.com/calendar?event_id=69149&include_contexts=course_20728)	10am to 11:30am
Wed Sep 12, 2018	Lecture 7: Digital Radiography (https://uthscsa.instructure.com/calendar?event_id=69150&include_contexts=course_20728)	10am to 11:30am

Date	Details	
Mon Sep 17, 2018	Lecture 8: Mammography - Instrumentation (https://uthscsa.instructure.com/calendar?event_id=69151&include_contexts=course_20728)	10am to 11:30am
Wed Sep 19, 2018	Lecture 9: Mammography - Receptors & Dosimetry (https://uthscsa.instructure.com/calendar?event_id=69152&include_contexts=course_20728)	10am to 11:30am
Mon Sep 24, 2018	Lecture 10: X-ray Radiography & Fluoroscopy (https://uthscsa.instructure.com/calendar?event_id=69153&include_contexts=course_20728)	10am to 11:30am
Wed Sep 26, 2018	Lecture 11: Interventional Radiology (https://uthscsa.instructure.com/calendar?event_id=69154&include_contexts=course_20728)	10am to 11:30am
Mon Oct 1, 2018	Lecture 12: Nuclear Magnetic Resonance (https://uthscsa.instructure.com/calendar?event_id=69155&include_contexts=course_20728)	10am to 11:30am
Wed Oct 3, 2018	Lecture 13: MRI Technology (https://uthscsa.instructure.com/calendar?event_id=69156&include_contexts=course_20728)	10am to 11:30am
Mon Oct 8, 2018	Lecture 14: MRI Pulse Sequences (https://uthscsa.instructure.com/calendar?event_id=69157&include_contexts=course_20728)	10am to 11:30am
Wed Oct 10, 2018	Lecture 15: Ultrasound Physics & Transduers (https://uthscsa.instructure.com/calendar?event_id=69158&include_contexts=course_20728)	10am to 11:30am
Mon Oct 15, 2018	Lecture 16: Ultrasound Demo (https://uthscsa.instructure.com/calendar?event_id=69159&include_contexts=course_20728)	10am to 11:30am
Wed Oct 17, 2018	Lecture 17: Ultrasound Display and Storage (https://uthscsa.instructure.com/calendar?event_id=69160&include_contexts=course_20728)	10am to 11:30am
Mon Oct 22, 2018	Lecture 18: Doppler US, QC, Bioeffects, Bubble Contrast, Harmonic US, 3D US (https://uthscsa.instructure.com/calendar?event_id=69161&include_contexts=course_20728)	10am to 11:30am
Wed Oct 24, 2018	Lecture 19: Computed Tomography - Methods & Modes (https://uthscsa.instructure.com/calendar?event_id=69162&include_contexts=course_20728)	10am to 11:30am
Mon Oct 29, 2018	Lecture 20: Computed Tomography - Reconstruction (https://uthscsa.instructure.com/calendar?event_id=69163&include_contexts=course_20728)	10am to 11:30am
Wed Oct 31, 2018	Lecture 21: CT Image Quality & Artifacts (https://uthscsa.instructure.com/calendar?event_id=69164&include_contexts=course_20728)	10am to 11:30am
Mon Nov 5, 2018	Lecture 22: Dosimetry in Projection Imaging & CT (https://uthscsa.instructure.com/calendar?event_id=69165&include_contexts=course_20728)	10am to 11:30am
Wed Nov 7, 2018	Lecture 23: Cone-beam, Quantitative CT, Advanced Reconstruction (https://uthscsa.instructure.com/calendar?event_id=69166&include_contexts=course_20728)	10am to 11:30am
Mon Nov 12, 2018	Lecture 24: Clinical CT Measurements Lab (https://uthscsa.instructure.com/calendar?event_id=69167&include_contexts=course_20728)	10am to 11:30am
Wed Nov 14, 2018	Lecture 25: Nuclear Spectroscopy/Detectors (https://uthscsa.instructure.com/calendar?event_id=69168&include_contexts=course_20728)	10am to 11:30am
Mon Nov 19, 2018	Lecture 26: Basic Nuclear Medicine Imaging (https://uthscsa.instructure.com/calendar?event_id=69169&include_contexts=course_20728)	10am to 11:30am
Mon Dec 3, 2018	Lecture 27: SPECT & PET Imaging (https://uthscsa.instructure.com/calendar?event_id=69172&include_contexts=course_20728)	10am to 11:30am
Wed Dec 5, 2018	Course Review (https://uthscsa.instructure.com/calendar?event_id=69173&include_contexts=course_20728)	10am to 11:30am
Mon Dec 10, 2018	Course Review (https://uthscsa.instructure.com/calendar?event_id=69174&include_contexts=course_20728)	10am to 11:30am

Date	Details	
Wed Dec 12, 2018	Final Examination (https://uthscsa.instructure.com/calendar?event_id=69175&include_contexts=course_20728)	10am to 11:30am