

**RADI 5018**  
**Physics Measurements in Imaging**  
**Spring, 2017**

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**CLASS DAYS and TIME:** Mondays, 6:00 pm - 9:00 pm

**CLASSROOM:** RII Library – McDermott 2.610

**COURSE FACULTY:** Geoffrey Clarke

**OFFICE LOCATION and HOURS:** RII – McDermott 2.426      5:00 pm -6:00 pm, Mondays

**EMAIL:** clarkeg@uthscsa.edu

**TELEPHONE:** 210-567-8114

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

### **COURSE DESCRIPTION AND OBJECTIVES**

This is a laboratory course focusing on performance of measurements used in quality assurance (QA), system characterization, and acceptance testing of medical imaging instrumentation.

**Pre-requisites** – none

**Semester credit hours** – 2 CU

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

- apply a fundamental knowledge of NMR physics to understanding the magnetic resonance imaging processes.
- discuss the concepts underlying various technologies used for magnetic resonance imaging.
- recount clinical and research applications of magnetic resonance imaging.

### **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

- 1) Auditory activities: listening to oral presentations**
- 2) Visual activities: reading assignments, watching videos, demonstrations, presentations (including graphs & tables)**
- 3) Tactile/Kinesthetic: solving problems, participating in term projects, taking quizzes**

**Materials** – AAPM Report #31 Standardized Methods for Measuring Diagnostic X-Ray Exposures (1990) AAPM Report #39 Specification and Acceptance Testing of Computed Tomography Scanners (1993) AAPM Report #42 The Role of the Clinical Medical Physicist in Diagnostic Radiology (1994) AAPM Report #65 Real-Time B-Mode Ultrasound Quality Control Test Procedures (1998) AAPM Report #70 Cardiac Catheterization Equipment Performance (2001) AAPM Report #74 Quality Control in Diagnostic Radiology (2002) NCRP Report #99 Quality Assurance for Diagnostic Imaging Equipment (1988) ACR Mammography Quality Control Manual (1999) Kodak Mammography Optimization Guide (1999) Kodak Identifying and Correcting Processing Artifacts (Technical and Scientific Monograph No. 4) ACR MRI Quality Control Manual (2001)

**Computer Access** – Students are required to bring wifi-enabled laptop for working through code and on-line quizzes.

**Demonstrations** – Methods for undertaking imaging equipment performance test in the clinical environment will be coordinated with Powerpoint presentations

## 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 required prior approval and rescheduling.

## TEXTBOOKS

**Required:** Quality Management in the Imaging Sciences, 5th ed. Jeffrey Papp, Ph.D., Mosby, St. Louis, 2014

## GRADING POLICIES AND EXAMINATION PROCEDURES

Grading: Reports = 80%, Oral Exam = 20%

### Grading System

A = 90-100%    B = 80-89.5%    C = 70-79.5%    F = < 70%

## 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/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/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

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.

Class **Schedule** is TENTATIVE and will depend upon the progress of the class.

	Date	Subject	Instructor	
1	Monday, Jan 30	Introduction, Equipment & Basic Concepts (RII)	Clarke	1
2	Monday, Feb 6	Radiation & Scatter Measurements (MARC)	Page & Griffin	2
3	Monday, Feb 13	X-ray System Performance Testing (MARC)	Clarke & Griffin	3
4	Monday, Feb 20	Resolution Measurements (MARC)	Clarke & Griffin	4
5	Monday, Feb 27	Fluoroscopy I (RII or MARC)	Page & Griffin	5
6	Monday, March 6	Fluoroscopy II (RII or MARC)	Page & Griffin	6
	MARCH 13	NO CLASS – SPRING BREAK		
7	Monday, March 20	Computed Radiography (MARC)	Clarke & Griffin	7
8	Monday, March 27	Computed Tomography I (CTRC)	Clarke & Griffin	8
9	Monday, April 3	Computed Tomography II (CTRC)	Clarke & Griffin	9
10	Monday, April 10	MR Imaging I (RII)	Clarke & Griffin	10
11	Monday, April 17	MR Imaging II (RII)	Clarke & Griffin	11
12	Monday, April 24	Mammography I (CTRC)	Page & Griffin	12
13	Monday, May 1	Mammography II (CTRC)	Page & Griffin	13
14	Monday, May 8	Ultrasound (MARC)	Page & Griffin	14
15	Monday, May 15	Final Exam (RII)		