Neuroimaging Methods RADI 6017
COURSE TITLE

Fall 2019

CLASS DAYS and TIME: Wednesday 2:00-5:00 PM

CLASSROOM: Research Imaging Institute (RII) – Room 2.414 (small conference room)

COURSE FACULTY: Jack L. Lancaster, Ph.D.

OFFICE LOCATION and HOURS: RII Room 2.412 (by appointment)

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

COURSE DESCRIPTION AND OBJECTIVES

Covers noninvasive imaging, monitoring, and stimulating methods used to study the functional organization of the human brain. Methods include optical imaging, positron-emission tomgraphy (PET), event-related potentials (ERP), magneto-encephalography (MEG), magnetic resonance imaging (MRI), and transcranial magnetic stimulation (TMS). Brain functions addressed include perception, action, emotion, and cognition. Course format includes lectures on the methods, in-class exercises, and seminars in which recent papers in the field are discussed.

Pre-requisites – RADI 6051 Statistical Parametric Mapping recommended

Semester credit hours – 3 hr. course

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

- Describe each of the imaging, monitoring and stimulating methods and their applications.
- Understand and critique current papers in the field
- Lead discussion of human brain imaging, monitoring and stimulating methods

COURSE ORGANIZATION

The main teaching modalities used in this course include:

1) Classroom lectures are supported by slides and computer based demonstrations

2) Students will be assigned one or more chapters to present to the class

3) Students will have hands on viewing and analysis exercises with most imaging modalities

Materials – Student's laptop computer. No additional materials required..

Computer Access – The Mango software for use in this class will be downloaded and is available for Windows, Macintosh, and Linux operating systems. Dropbox will be used to provide images for classroom exercises.

Reading Assignments – Most lectures are keyed to chapters in the textbook. Reading materials for other lectures will be provided using Dropbox and students notified by e-mail.

ATTENDANCE

Students are expected to attend all class lectures. Absences can be excused by permission of course director.

TEXTBOOKS

Required: ***Brain Mapping: The Methods*** 2nd Ed., Toga AW & Mazziotta JC, Academic Press, San Diego, 2002.

Recommended: ***Brain Mapping: The Systems***, Toga AW & Mazziotta JC, Academic Press, San Diego, 2000.

GRADING POLICIES AND EXAMINATION PROCEDURES

Each student will be assigned one or two chapters (depending on class size) and will lecture and provide a PowerPoint presentation for grading. Grading will be weighted 50% on the presentation and 50% on the PowerPoint document.

Classroom exercises will be provided for several neuroimaging imaging systems and results submitted to the instructor for grading.

A final exam will be given covering the chapters dealing with neuroimaging methods.

Final grade will be the average of the presentation, classroom exercises and the exam grade.

Grading System

Include a grading scale used to determine final grades, see example below

A = 90-100% B = 80-89% C = 70-79% F = < 69%

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

Images for classroom assignments will be sent to the class as group e-mail. Students will return completed assignments to the course director by e-mail before the close of day its due. For late assignments the grade will be reduced 10% per day up to 30%. The preferred format for students' assignments is a pdf file.

USE OF RECORDING DEVICES

Both audio and video recordings of the class lectures are permitted for those that are unable to attend class.

ELECTRONIC DEVICES

Each student should bring their laptop computer to class. Examples for class exercises will be done on students' laptops to verify that they understand methods.

TENTATIVE CLASS SCHEDULE

Neuroimaging Methods RADI 6017

Fall 2016

WEEK	DATE	TOPIC	Assignment	Instructor and Modality
Week 1	5 Jul	Introduction to cartography of brain	Chapters 1 & 2	JLL
		Time and space		
Week 2	12 Jul	Dynamic optical imaging of neuronal	Chapter 3	LTW
		structure and physiology		
Week 3	19 Jul	Optical imaging of intrinsic signals	Chapters 5 & 6	JLL
		Near-infrared spectroscopy and imaging		
Week 4	26 Jul	Electrophysiological methods for	Chapter 9	ERP staff
		mapping motor and sensory circuits		
Week 5	2 Aug	MEG: Basic principles and methods	Chapter 10	JLL
Week 6	9 Aug	TMS: Basic principles and methods	Chapter 11	JLL
Week 7	16 Aug	Neuroanatomical MRI	Chapter 16	JLL
Week 8	23 Aug	Functional MRI	Chapter 12 & 13	JLL
Week 9	30 Aug	Spectroscopy MRI	Chapter 14	GDC
Week 10	6 Sep	Diffusion MRI	Chapter 15	JLL
Week 11	13 Sep	CT angiography & perfusion	Chapter 17	JLL
Week 12	20 Sep	PET functional brain imaging	Chapter 18	JLL
Week 13	27 Sep	SPECT functional brain imaging	Chapter 19	JLL
Week 14	4 Oct	Experimental design for SPM	Chapter 22 & 23	JLL
Week 15	11 Oct	Advanced registration methods	Chapter 24 & 25	JLL
Week 16	18 Oct	Brain Atlases	Chapters 27 & 28	JLL
Week 17	25 Oct	BrainMap database	BrainMap papers	JLL

JLL - Jack L. Lancaster GDC – Geoff D. Clarke LTW – Lora T. Watts