

Psychology 410: Principles and Uses of fMRI
Summer, 2005
MTWU, 8-9:50
301 Gerlinger

Instructor

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Office Hours: Tuesday 10-11:30, and Wednesday 10-11:30

Textbook

Scott Huettel, Allen Song, & Gregory McCarthy (2004), Functional Magnetic Resonance Imaging, Sinauer.

General Course Description

My goal in this course is to help you build an appreciation for how fMRI research is done and to make you aware of the value and the limitations of imaging research. This course is not designed to certify you to run fMRI studies or teach you hands-on methods. Rather, the goal is teach you the basic underlying principles that allow us to perform fMRI studies and to provide you with the conceptual tools you need to think critically about fMRI research.

Course Format

The material for this class will be presented through assigned readings, class lectures, discussions, and in-class demonstrations and activities. Lectures will be designed to supplement the text, not merely repeat it. As such, there will be material in lecture that is not covered in the book and material from the book not covered in lecture. You will be responsible for all the materials presented in lectures and in the readings. Therefore, I am more than willing to speak with you during office hours about difficult material from the text that I have not covered in class or anything that you found confusing in the lecture. You are expected to have done the reading before class in order to get the most out of the lectures. In addition to the assigned chapters from the textbook, I will occasionally assign other reading materials which will be posted on the Blackboard site associated with this course.

Course Evaluation

Grades will be based on one exam (40%), a presentation and a paper on a special topic (40%), and quizzes, homework, and in-class assignments (20%).

Exam (40%)

The exam will consist of a mixture of multiple choice and short answer questions (each section worth half of the total grade). This exam will cover all of the material up until we begin discussing the special topic areas. Make-up exams will only be considered if the student has a note from a doctor.

Presentation and Paper (40%)

Later in the course you will form groups to discuss specific topics in psychology that you are interested in (e.g., working memory or language development). Each member of your group will select an empirical fMRI paper that addresses that topic. You will each give a short (approximately 10 minute) Powerpoint presentation to the class on the paper you chose. In addition to this presentation you will be required to write a brief (4-6 page) summary of the article discussing the significance and impact of the paper and a critical analysis of their methods and conclusions. This assignment will be discussed in more depth later in the term.

Quizzes, Homework, and In-Class Assignments (20%)

Throughout the course there will be in-class assignments, homework, and quizzes that you will need to turn in. Some quizzes may be announced ahead of time, but there will also be some pop quizzes. Anything covered in the reading or class is fair game on the quiz and you are expected to have already read that day's reading assignment when you show up to class. There will be no opportunity to make up these assignments, so if you miss class frequently your grade will suffer.

Extra credit

You may receive extra credit for this class by participating in an fMRI experiment. If you participate in a study during the term you will raise your final grade by 2%.

Tentative Course Outline

Date	Lecture Topic	Reading Assignment
6/20	Overview of course and Background	Ch. 1
6/21	MRI system and safety	Ch. 2
6/22	Basic physics of MRI	Ch. 3
6/23	LCNI tour (meet at the LCNI); More physics	No reading
6/27	Image formation and pulse sequences	Ch. 4 and 5
6/28	Biological basis of fMRI and Basic neuroanatomy	Ch. 6
6/29	BOLD imaging and other imaging methods	Ch. 7
6/30	Spatial and temporal properties of fMRI	Ch. 8
7/4	No class – Fourth of July	
7/5	Signal and noise in fMRI	Ch. 9
7/6	Experimental Design	Ch. 11
7/7	Data analysis and statistics	Ch. 10 and 12
7/11	Exam	
7/12	LCNI visit, Class experiment (Tentative date)	No reading
7/13	Special topics – TBA	TBA
7/14	Special topics – TBA	TBA