

BSEN 896 SEC 601 SUMMER 2017 (6/5/2017-8/12/2017)

INDEPENDENT STUDY WITH A FOCUS ON NEUROIMAGE

Program Affiliation:	Biomedical Engineering
Class Meetings:	Bi-weekly, T: 2-3 p.m. (no meeting during 6/28-7/12) C67, Center for Brain, Biology and Behavior
Credit:	3 hours
Instructor:	Yingying Wang, Ph.D. yingying.wang@unl.edu Office phone: 402-472-0106 Office hours: by appointment, schedule via email.

Course Description

This is an independent study with special focus on neuroimaging techniques and is designed to give students solid understanding of state of art neuroimaging techniques including Electroencephalography (EEG), Magnetoencephalography (MEG), and Functional magnetic resonance imaging (fMRI), Diffusion Tensor Imaging (DTI). Students are expected to work on sample data on their own and bring questions to bi-weekly meeting. In addition, special topics can be discussed based on the interests of enrolled students.

Course Objectives

This course will cover a variety of neuroimaging techniques with a focus on the brain. The goal is to lay a solid foundation of different types of neuroimaging techniques and provide hands-on experience for students to analyze brain imaging data. Upon successful completion of this course, it is anticipated that students will be able to understand core concepts and brain research using various neuroimaging techniques.

- Learn different types of brain imaging tools and how they can be used in research.
- Learn how to analyze different types of neuroimaging data.
- Interpret research data and statistical analyses from results section of published articles.
- Demonstrate critical thinking about research questions and findings in the literature.

Course Prerequisites

None.

Course Format

Hands-on experience with imaging data and problem solving skills in research. Materials will be uploaded to Canvas or instructor's website. You will be able download all the electronic materials to your personal computer for future academic use only. This is a self-paced independent study with guidance from the instructor. Students are encouraged to finish all assigned readings and analyzing all the sample data with the help of documentation provided by the instructor.

Reading Materials and Useful Resources

Canvas course website at <http://canvas.unl.edu> for announcements, course materials, and online forums.

Course Requirements

Details regarding each assignment will be distributed in a separate correspondence.

1. FMRI data analysis (25 points)
2. MEG data analysis (25 points)
3. EEG data analysis (25 points)
4. DTI data analysis (25 points)

Course Grading

The grade for the course will be based on assignments.

Total points possible: 100

Grades will be assigned as follows:

A+	97 - 100
A	94 - 96
A-	90 - 93
B+	87 - 89
B	84 - 86
B-	80 - 83
C+	77 - 79
C	74 - 76
C-	70 - 73
D+	67 - 69
D	64 - 66
D-	60 - 63
F	< 60

If your level of achievement during this course is falling short of your goal, you are strongly encouraged to consult with the instructor to improve your quality of learning of course materials.

Tentative Schedule of Course Topics and Readings

#	Week	TOPIC	READINGS
1	Jun. 05:	Introduction & Discussion	Syllabus
2	Jun. 12:	FMRI basis and hands-on assignments	Assigned readings
3	Jun. 19:	FMRI basis and hands-on assignments	Assigned readings
4	Jun. 26:	MEG basis and hands-on assignments	Assigned readings
5	Jul. 03:	MEG basis and hands-on assignments	Assigned readings
6	Jul. 10:	EEG basis and hands-on assignments	Assigned readings
7	Jul. 17:	EEG basis and hands-on assignments	Assigned readings
8	Jul. 24:	DTI basis and hands-on assignments	Assigned readings
9	Jul. 31:	DTI basis and hands-on assignments	Assigned readings
10	Aug. 7:	Summary & Discussion	Assigned readings

UNL Student Code of Conduct

Download Link: <http://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf>

Students are expected to adhere to the UNL Student Code of Conduct. “The community of scholars at the University of Nebraska Lincoln is dedicated to personal growth and academic excellence. By choosing to join the community, each member agrees to comply with certain standards of civilized behavior; and therefore, the University of Nebraska Lincoln adopts this Student Code of Conduct, in order that it might: 1) promote a campus environment that supports its educational, research, and outreach missions; 2) protect the members of the community and its resources from disruption and harm; 3) provide a guide to appropriate individual and group behavior; and 4) foster ethical standards and civic virtues, all in keeping with the STUDENT STATEMENT OF VALUES adopted by the Association of Students of the University of Nebraska Lincoln on January 15, 2014.” (page 1)

Academic Integrity (see the UNL Student Code of Conduct)

Students will receive a grade of zero on any assignment where the instructor determines that there is credible evidence of academic dishonesty. Any finding(s) of academic dishonesty and sanction(s) will be reported to the UNL Dean of Students. Acts of academic dishonesty include, but are not limited to, the following: cheating, fabrication or falsification, plagiarism, abuse of academic materials, complicity in academic dishonesty, falsifying grade reports, impermissible collaboration, misrepresentation to avoid academic work. See the UNL Student Code of Conduct for further information.

Requests for Accommodations for Disability (more: <http://www.unl.edu/ssd/home>)

The University of Nebraska-Lincoln is committed to a pluralistic campus community through Affirmative Action and Equal Opportunity. We assure reasonable accommodation under the Americans with Disabilities Act. Students with disabilities are encouraged to contact me for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 232 Canfield Administration, 472-3787 (voice) or 472-0053 (TTY). It is the responsibility of the student requiring accommodation to be proactive in contacting the instructor for a confidential discussion of their individual needs, and to provide relevant documentation from the SSD.

Weather Emergencies (more: <http://emergency.unl.edu/unlalert>)

The decision to close the University because of severe weather or other reasons shall be made by the Chancellor. The Director of University Communications will notify radio and television stations and other appropriate media. Every effort will be made to have closedown information in the news media by 6:00 a.m. for day classes and by 2:00 p.m. for night classes. **During an emergency, the UNL community and public will receive information through the web and news media as well as by email and text through UNL Alert.**

Safety

The safety of all individuals in SECD is of utmost importance to the department. General emergency information can be found on the UNL police department website at <http://www.unl.edu/emergency/>. Faculty and students are strongly encouraged to sign up for the UNL Text Alert system, which provides messages during emergency situations. Sign-up can be completed at: <http://emergency.unl.edu/unlalert>. The phone number for UNL police is 402-472-2222. If there is an immediate emergency, dial 911. The following is a list of topics that may

require action. Preparation is the best way to manage emergency situations. Please consider reviewing the policies and procedures for the following possible incidents each semester:

Tornado: <http://emergency.unl.edu/procedure/tornado>

Fire: <http://emergency.unl.edu/procedure/fire>

Active Shooter: <http://emergency.unl.edu/procedure/shooting-incident>

Shots Fired: <http://emergency.unl.edu/shotsfired>

Caveat

This syllabus represents a written contractual agreement between us. Occasionally, it may be necessary to revise the syllabus to meet students' or university needs. The instructor reserves the right to revise this syllabus if the need arises. Advance notification will be provided to you.