

SLPA 981: Seminar Course: Brain Imaging Research

Fall/2019

Program Affiliation: Special Education and Communication Disorders
Class Meetings: Wednesday 3:00 P.M. – 4:40 PM, in 302 BKC
Credit: 2 – 3 hours
Instructor: Yingying Wang, Ph.D.
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Office hours by appointment, schedule via email
Office: C67 East Stadium, 402-472-0106

Course Description

This is a graduate-level seminar course and is designed to train students from diverse backgrounds to understand the characteristics of various types of brain imaging techniques and their applications in the field of communication disorders. This seminar course aims to introduce six neuroimaging techniques including functional Magnetic Resonance Imaging (fMRI), MRI, functional Near-Infrared spectroscopy (fNIRS), Magnetoencephalography (MEG), Electroencephalogram (EEG), and Diffusion-Weighted Imaging (DWI). Students will have hands-on experience with some brain imaging data and learn how to analyze different types of brain imaging data. Through interactive discussion and literature review, students will practice how to generate neuroscience questions in their research fields of interests and apply appropriate brain imaging techniques to answer their research questions.

Course Prerequisites

None.

Course Objectives

The overall goal is to broaden graduate students' interests in brain research and encourage them to apply brain imaging techniques to do research in their fields of interests. The detailed objectives are listed as follows:

1. Understanding the characteristics of different brain techniques.
2. Providing hands-on experience with analyzing various brain imaging data.
3. Demonstrating critical thinking through evaluating current literature on neuroscience research related to language/reading impairments.
4. Formulating hypotheses of a research topic by choice and developing research strategies to test hypotheses.
5. Mastering research design and methods in the context of brain imaging research.
6. Learning scientific communication through the in-class presentation.
7. Producing a National Institute of Health (NIH)-style specific aim page.

Rationale Statement

This course is an elective course in the speech-language pathology (SLP) graduate degree to broaden those who are interested in neuroscience to have foundation knowledge about brain imaging techniques. It is also open to diverse students from other graduate degree such as Psychology, Biomedical Engineering, Educational Psychology or related fields.

Competency Assignment for Professional Organization (ASHA)

This is an elective course for SLP graduate students and is also open to other graduate students who have interests in brain imaging techniques. Therefore, the main core competencies for ASHA are not tracked for this course. However, SLP graduate students will be engaged with knowledge competencies related to integrating research principles into evidence-based clinical practice.

Teaching/Learning Methods

The format of this class will be a mix of lectures, discussions, and labs.

Readings Assignments

There is no required text for this course. However, you are encouraged to own some books from the list of the recommended reading materials and read journal articles from this list of the recommended professional journals.

Recommended Reading Materials:

- Penny, W. D., Friston, K. J., Ashburner, J. T., Kiebel, S. J., & Nichols, T. E. (Eds.). (2011). *Statistical parametric mapping: the analysis of functional brain images*. Elsevier. ISBN-13: 978-0123725608.
- Carter, M., Shieh, J., (Eds.). (2015). *Guide to Research Techniques in Neuroscience*. Second Edition, Elsevier, ISBN-13: 978-0128005118.
- Passingham, R. E., & Rowe, J. B. (2016). *A short guide to brain imaging: The neuroscience of human cognition*. Oxford University Press, USA. ISBN-13: 978-0198709138.

Recommended Professional Journals:

- Brain
- Brain Research
- Cerebral Cortex
- Human Brain Mapping
- NeuroImage

Technology/Material/Equipment Requirements

None. If you don't have MATLAB installed in your computer, you can use computers in the Ricketts lab located on the third floor of Barkley Memorial Center.

Course Requirements

1. Class Discussions (points: 10)
You will be graded based on your participation and responses to the in-class discussions.
2. Assignments (points: 30)
You will be graded based on your responses to the take-home assignments related to the hands-on lab sessions.
3. Final written product (points: 30)
The student will write a National Institution of Health (NIH)-style specific aim page (1 page).
4. Class presentation (points: 25)
The student will present the research plan (~30 minutes) in class. The other students will judge, make comments, and ask questions during class.
5. Classroom participation (points: 5)
Classroom participation is not only attendance but also engagement. Students are expected to attend all classes and participate in the in-class discussions. Attendance will be taken each class, and attendance records will be considered when assigning a final course grade. Perfect attendance and actively participating in class discussion will get 5 points. Absence without 24-hour advance written notice will result in a point deduction.

The grading scale is as follows:

A+	97.50-100	B+	87.50-89.99	C+	77.50-79.99	D+	67.50-69.99
A	92.50-97.49	B	82.50-87.49	C	72.50-77.49	D	62.50-67.49
A-	90.00-92.49	B-	80.00-82.49	C-	70.00-72.49	D-	60.00-62.49
						F	< 60

Class Expectations

1. Students are responsible for all information presented in class as well as independent analysis of information from the readings directly.
2. Learning outside the classroom is essential to enhance your in-class learning experience. Plan to work 4-6 hours per week outside of class to review various literature. You are encouraged to meet with fellow classmates outside of class to study lecture notes, discuss readings, and work on written assignments. However, all assignments except for group projects must be the work of an individual. DO NOT TURN IN DUPLICATE ANSWERS.

- Readings will not always be discussed in class. However, you are responsible for knowing the information contained in the readings and class lectures. The lecture PowerPoint presentation and other course-related materials will be in electronic form on Canvas.
- All written assignments will follow the guidelines contained in the publication manual of the American Psychological Association (APA). This book may be found at the following link: <http://www.apa.org/books/4200061.html>
- If you need extra help communicating your thoughts in the written form (i.e, writing a paper) you may wish to consult the writing center on campus. The University of Nebraska-Lincoln Writing Center can provide you with meaningful support as you write for this class as well as for every course in which you enroll. Trained peer consultants are available to talk with you as you plan, draft, and revise your writing. Please check the Writing Center website for locations, hours, and information about scheduling appointments. www.unl.edu/writing.

Tentative Schedule of Course Topics and Readings

Date	#	Topic	Readings	Assignments Due*
8/28	1	Introduction	Syllabus	N/A
9/4	2	MRI and its applications	Assigned Readings in Canvas	N/A
9/11	3	fMRI and its applications	Assigned Readings in Canvas	N/A
9/18	4	fNIRs and its applications	Assigned Readings in Canvas	N/A
9/25	5	lab: BKC 113 NL3 Wang Lab	Assigned Readings in Canvas	N/A
10/2	6	CB3 Tour and fNIRS live demo	Assigned Readings in Canvas	Assignment 1
10/9	7	EEG/MEG and its applications	Assigned Readings in Canvas	N/A
10/16	8	DWI and its applications	Assigned Readings in Canvas	N/A
10/23	9	No Class – Extra time for lab assignment	Assigned Readings in Canvas	N/A
10/30	10	Assignment 2 Lab	Assigned Readings in Canvas	Assignment 2
11/6	11	NIH style specific aim and presentation	Assigned Readings in Canvas	N/A
11/13	12	Research Methods and Design I	Assigned Readings in Canvas	N/A
11/20		No Class – Extra time for writing	Assigned Readings in Canvas	N/A
11/27		No Class - Thanksgiving Holiday	N/A	N/A
12/4	13	Research Methods and Design II	N/A	N/A
12/11	14	In-Class Presentation and Course Summary and Q & A	N/A	N/A
12/18		No Class - Final Exam Week	N/A	12/18 11 p.m.

Exam Scheduling Policy

If a student can't take an exam at the scheduled time, he/she should contact the instructor 24 hours in advance to reschedule the exam time and date. If 24-hour notice is not given, the exam will not be rescheduled and the student will receive a grade of zero for the exam. If there is a medical or other significant emergency which keeps the student from attending the exam without 24-hour notice, the instructor may ask for documentation (e.g., doctor note, police report) and a makeup is at the discretion of the instructor.

Class Attendance Policy

Students are expected to attend all classes and to keep up with the class information if absent. Attendance will be taken each class. If a student can't make it to the class, he/she should contact the instructor 24 hours in advance to get written permission. If 24-hour notice is not given, the student will get point reduction for his/her attendance. If there is a medical or another significant emergency which keeps the student from attending the class without 24-hour notice, the instructor may ask for documentation (e.g., doctor note, police report).

Statement of Academic Dishonesty

"Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University supports a Student Code of Conduct which addresses the issue of academic dishonesty."

Diversity Statement

"The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 232 Canfield Admin. Bldg.; 402-472-3787."

Use of Cell phone and Laptop During Class

Cell phone must be turned off or on silent mode during class. Students are not allowed to call, text, or surf during class. If you need to take an emergency call or text, you need to leave the class and return when finished. Laptop must be turned off or on silent mode during class. Laptop can only be used to take notes.

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)

Professionalism and Civility

You are expected to exhibit professional behavior that demonstrates respect for the learning environment. This includes being on time for class, maintaining attention/alertness during class, and refraining from use of technology except as it relates to instructor-directed in-class activities pertinent to the class in session. Cell phones must be silenced and put away while in the classroom. Net surfing, reading emails, working on assignments for other classes, etc. are not permitted during class time as a courtesy to your fellow students and instructor. It is each student's responsibility to monitor your own behavior and wakefulness. If you find yourself feeling sleepy, it is fine to remove yourself from the classroom, take a few minutes to refresh, and then return to the classroom, though you will be responsible for any missed information.

The nature of the course material may include graphic images and information about medical conditions and surgical procedures. Additionally, course content may touch on a variety of controversial topics including matters of race, gender, culture, religion, morality, sexuality, and violence. If you anticipate discomfort during such content, you should sit near an exit so that, if necessary, you may step out of the room for a few minutes. As with any other self-initiated break, you will be responsible for any missed information. Furthermore, you have a right to believe whatever you believe about such matters and to express your views (when relevant to the course and in accordance with the principles of professionalism and civility previously described) even when others in the class may disagree or be offended by your views. You also have the right to express disagreement with the views of others, including the instructor, and to decide whether or not to modify your views. Your grade in the class will be based on understanding and reasoning, not on your opinion, though you should be aware that the ASHA Code of Conduct delineates certain professional behaviors that are mandated regardless of one's personal beliefs.

Your work is expected to adhere to professional standards in terms of spelling, grammar, use of first-person language consistent with IDEA standards, appropriate APA-formatted citations of work derived from another source, and timeliness. The grade for any assignment submitted late will be reduced by 5% of its available points for each day overdue, unless the student makes other arrangements with the instructor at least 7 days prior to the assignment due date.

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>

Continuity of Instruction

If face-to-face classes are officially suspended due to a pandemic or other catastrophe, I will strive to continue instruction to those that can participate. If face-to-face classes are suspended, you will receive an email from me and I will post a Canvas Announcement that details how we will communicate and what you can expect during the time that classes are suspended. Students should check these sources regularly for course information.

Copies of Work

It is recommended that students make a copy of any submitted assignments they turn into the instructor as a record and a back-up of their work.

Sharing Course Materials

Examinations, course handouts, and course PowerPoint slides may not be posted on electronic websites or shared with other people without the written consent of the instructor. Posting or otherwise sharing copies of examinations from this class is not permitted.

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.