PSYC G4222 – The Cognitive Neuroscience of Aging
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Fall 2019

I. Bulletin description

PSYC G4222. The Cognitive Neuroscience of Aging (seminar). 4 pts. Tuesdays: 10.10 AM-12.00 PM.
Prerequisites: Courses in introductory psychology, cognitive psychology, and instructor permission.

This course is a comprehensive overview of conceptual and methodological approaches to studying the cognitive neuroscience of aging. The course emphasizes the importance of combining information from cognitive experimental designs, epidemiologic studies, neuroimaging, and clinical neuropsychological approaches to understand individual differences in both healthy and pathological aging.

II. The rationale for giving the course

This course provides a comprehensive overview of conceptual and methodological approaches to studying the cognitive neuroscience of aging and is intended to introduce students to the relevance and challenges of studying the aging brain. The primary instructors as well as guest lecturers will come from the interdisciplinary faculty of the Cognitive Neuroscience Division in the Sergievksy Center at Columbia University Medical Center. The course emphasizes the importance of combining information from cognitive experimental designs, epidemiologic studies, neuroimaging, and clinical neuropsychological approaches to understand individual differences in both healthy and pathological aging.

This advanced seminar is best suited to students who have completed two or more lecture courses beyond W1001, such as W1010 (Mind, Brain, and Behavior), W2210 (Cognition: Basic Processes), W2215 (Cognition and the Brain), W2220 (Cognition: Memory and Stress), or W2480 (Developing Brain). It will complement seminar offerings in cognitive neuroscience, and provide an important developmental component to students' training.

PSYC G4222 is an advanced seminar, designed particularly for graduate students, for advanced undergraduates who are majoring in Psychology or in Neuroscience and Behavior, and for students participating in the Postbac Psychology Program. These students will have priority in registration, followed by junior majors followed by non-majors.

It fulfills the following degree requirements:

- For Psychology Graduate Students, PSYC G4222 will apply toward the "two seriously graded seminars" requirement of the Master's degree.
- For the Psychology major or concentration in the College and in G. S., for the Psychology minor in Engineering, and for the Psychology Postbac, G4222 meets the Group I (Perception and Cognition) distribution requirement.
- For the Neuroscience and Behavior joint major, G4222 will fulfill the 5th Psychology requirement: "one advanced psychology seminar from a list approved by the Psychology Department advisor to the program."
- For non-majors in the College and GS, G4222 will count as one term of the natural science requirement, provided that students obtain the necessary permission and have taken the prerequisite psychology courses. Students who are majoring in Psychology or in Neuroscience and Behavior will have priority over students who are taking the course for the science requirement, and we anticipate the course will rarely be used for the latter.
- For the Psychology Postbac certificate, PSYC G4222 will fulfill the advanced seminar requirement.
- For the Barnard Psychology major, PSYC G4222 will fulfill the senior seminar requirement.

III. The reading list and weekly syllabus

Each class session will be roughly organized as**:**

- 15 minute recap
- 45 - 60 minute invited presentation
- 15 - 30 minute student presentation
- Discussion of the presentation and student questions

Readings are available as PDFs on https://courseworks.columbia.edu and are posted at least two weeks prior to the corresponding lecture date.

Session Topic and Speaker (subject to revision):

1. 9/3/2019 Introduction & Methodological overview (Dr. Habeck)
2. 9/10/2019 A neuroimaging biomarker to predict memory decline (Dr. Leavitt)
3. 9/17/2019
4. 9/24/2019 Cognitive Reserve, the brain's ability to cope with pathology (Dr. Stern)
5. 10/1/2019
6. 10/8/2019
7. 10/15/2019 Neuropsychological Testing and differential diagnosis (Dr. Cosentino)
8. 10/22/2019
9. 10/29/2019 White matter structural integrity in aging (Dr. Gazes)
10. 11/5/2019 NO CLASS
11. 11/12/2019 Exercise and diet in aging (Dr. Gu)
12. 11/19/2019 Machine learning to classify cognitive phenotypes in multiple sclerosis (Dr. Buyukturkoglu)
13. 11/26/2019 Processing of emotional information across the adult lifespan (Dr. Kever)
14. 12/3/2019 Culture, cognition, and health disparities in aging (Dr. Manly)

IV. Course requirements and grading

Discussion leadership

On the first day of class, students will sign up for 1-2 class meetings (depending on number of students) during which he/she will make a presentation. Students should prepare a presentation as well as thought-provoking questions addressed to the class. The presentation should be comprehensive, but be open enough in format to allow for ongoing discussion. In advance, students will meet to discuss the topic and format of the presentation with the lecturer affiliated with the class for which they signed up. Typically, the student will present an article from the required readings; however, the format and content is somewhat open and should be coordinated with the primary lecturer for the chosen class.

Questions generated by the readings

Each student is required to read assigned papers (that will be posted 2 weeks in advance) before class in order to ensure lively discussion in class. Each student will also be responsible for composing one substantive question relevant to each of the readings and posting their questions on Courseworks each week by Sunday 9PM. Students are not allowed to replicate already posted questions. Discussion leaders should incorporate these questions into their presentation, but are not required to post questions the week they are presenting. Evaluation of the quality and quantity of participation will be included in final grade.

Research paper

This should take the form of a critical review paper. The topic can be of your choosing; however we strongly recommend that you do your paper on the topic that you will be presenting in class. Although you can discuss your paper with one of the instructors anytime during the semester, it is strongly suggested that you submit your paper idea by midterm (Oct. 15, 2019) and meet with an instructor once (preferably twice), at least one month prior to the due date, for discussion. Your paper should be based not only on the assigned readings, but also on any suggested readings and a set of additional readings to be agreed upon during this meeting. Important criteria for grading will be evidence that you are not simply outlining or regurgitating the readings, but are attempting to synthesize them, organize them around a theoretical perspective, point out areas of controversy and most importantly, suggest a novel perspective or avenue for future research. 15 pages maximum. Any pages exceeding 15 will be disregarded. Even if the class presentation of your chosen topic is toward the end of the semester, you should begin research on your topic fairly early in the semester so that you can develop and reflect on your ideas throughout the class.

Papers will be due on Dec. 10, 2019 via CourseWorks.

Class Participation

Active participation in class discussion is essential to gaining a full understanding of the course materials. Therefore, each student is allowed one absence with prior notice. After that, each absence will result in 1.5 (20%points/13classes) %points deducted from the final course grade.

Grading will be determined as follows:

20%	Class Participation
20%	Content and Timeliness of Posted Discussion Questions
30%	Presentation / Discussion leadership
30%	Paper