PSY 610: Advanced Cognitive Neuroscience

Spring 2020, 35504
The class will be taught remotely through Canvas & Zoom
This syllabus is preliminary as of 03/31/2020 and may be updated as we settle on more details.

Instructors
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For office hours, we are happy to schedule virtual one-on-one meetings. Just email us as needed.

Content
Welcome to PSY 610 Advanced Cognitive Neuroscience. The goal of this class is to explore how the brain gives rise to human cognition. While we cannot cover the whole area, we will include a broad survey of the field, including perception, attention, memory, decision-making. We will put a particular emphasis on understanding the methodological approaches to the study of the brain and cognition and developing transferable skills.

Learning objectives
• Become familiar with the current methods and topics in cognitive neuroscience so you can become an educated “consumer” of cognitive neuroscience research.
• Become comfortable at reading and discussing primary research literature and critically evaluating data and conclusions, including their relevance to your own area of inquiry.
• Become comfortable with delivering a scientific presentation, including a remote format.
• Learn to write a concise and compelling research proposal that identifies a scientific question, proposes a hypothetical answer to this question, and describes a novel research strategy to test it.
• Learn to clearly and succinctly communicate scientific work of self and others in oral and written form and provide constructive feedback on others’ work.

Format
Due to the current coronavirus situation, all instruction and interactions will proceed remotely. Although lively in-class discussions strongly contribute to this being our favorite class to teach, we are fully committed to providing the best learning experience to you in the remote format. We also see this term as an exciting opportunity. With online education on the rise and virtual seminars and conferences already taking place prior to the current crisis due to environmental reasons, the experience and skills we all gain this term are going to serve us well in the future. We are grateful that we get to explore this new format together with our junior colleagues (you!), in mutual support.

We will have synchronous online Zoom meetings during the regular class time, Monday and Wednesday at 10am. They will last about an hour and you can access them through the Zoom Meetings link in Canvas. The online meetings will be dedicated to Q&A, discussion of the past week’s material, interactive presentations by students and instructors, and getting together as a community. The details of the remote instruction and interaction will be evolving throughout the term, but it will combine assigned readings, synchronous and asynchronous instruction, student presentations and class discussions though discussion boards and tele-conferences. All materials will be provided through Canvas Modules by Wednesday night of the current week (as some of the material will be recordings from the Wednesday Zoom meeting) and you will work through them...
each week mostly at your own pace. There will be weekly assignments to help you learn the material, with a single weekly deadline on Sunday 11:59pm to give you a maximum flexibility. However, we recommend that you break up each week’s material into smaller chunks that you tackle in 2-4 blocks of time that you build into your regular weekly schedule. Each week will be wrapped up during the Monday Zoom meeting, when we will have student presentations and discussions of last-weeks’ papers. As the background knowledge of students entering the class varies widely, as does experience with remote instruction and technology, please do not hesitate to ask questions of any level throughout the class.

**Workload**: The UO specifies that for a 4-credit graduate class, your workload should be about 160 hours throughout the 10-week term. You are expected to be highly active in the class. Please take your time reading and thinking about the assigned papers each week. Complete all readings, instruction videos and assignments in a timely manner. Think about how you can relate what you are learning in the class to your own research or to your life. Nurture your curiosity about the mind and brain in one of your last formal class experiences.

**Class activities and how they will contribute to your grade**
The workload for this class will be split across multiple activities that are jointly designed to achieve the course learning objectives. Here are the key components and their weight in your final grade:

**Weekly assignments, quizzes and discussions (40%)**
Each week’s module will contain several components, including readings, videos, short assignments and/or quizzes. Some will be graded for completion and others based on performance. You will complete them continuously throughout the week as you work at your own pace through the week’s module, but they will be formally due each Sunday at 11:59pm. An important part of each week’s module will be a **discussion of the assigned readings through Canvas discussion** and online meeting discussion (when possible). While background knowledge will vary widely in the class, everyone is expected to learn something new and contribute their perspective. After completing the assigned readings, you will post one or two questions or comments about the readings and answer one or two other students’ comments on Canvas. You may want to visit the discussion board more than once to read and/or answer new contributions. Ideas that connect the current reading to prior readings or your own work are also exciting to read. Additional discussion of the prior week’s material will be held during our Monday online meeting, but you will not be penalized if you are unable to attend the online meeting (due to technical or other strong constraints), as long as you actively participate on the Canvas discussion board.

**Research article presentation (15%)**
Each student will present and—if possible—lead a discussion of an assigned reading during our online meeting once during the term. The presentation should be 15-20 minutes long and consist of background, specific question or hypothesis addressed, explanation of methods, description and interpretation of results, and conclusions with your evaluation. Detailed grading rubric is available on Canvas. When you present, you are expected to do some background reading, so you can explain the context of the study and the methods and results to your classmates. However, you are not expected to be able to figure out every detail. You are welcome to consult one of the instructors if you need help and it is also fine if you highlight during your presentation a challenging aspect of the results that you may not understand, so we can work through it together during discussion. If you end up unable to present during one of our virtual meetings, we will help you find another solution, such as recording your presentation for asynchronous delivery. Your own presentation is worth 11% of the final grade. Twice during the term, you will also be asked to provide a constructive critique of someone else’s presentation, using the presentation rubrics. (4%)
Final project (45%)
We would like you to ponder how cognitive neuroscience tools can help us answer novel questions and give you an opportunity to practice clear and concise formulation of ideas. To this end, you will write a short research proposal for a cognitive neuroscience project of your choice. You should venture out from your immediate research area, although a proposal that ties the class material to your own research is acceptable if cleared with the instructors in advance.

The completion of the final project is scaffolded through several steps, including two brief presentations:

- Week 4: submit a topic
- Week 6: submit 1-page draft with a brief motivation and research design.
- Week 7: present an elevator speech (3 minutes, no powerpoint) about what you plan to write.
- Week 8: submit a semi-final draft.
- Week 9: comment on two other proposals assigned to you, using the final project rubric.
- Week 10: presentations and discussions of the proposals.
- Finals Week: submit final paper by Wednesday at midnight.

The semi-final draft and the final paper should:

- Include the following sections: motivation, detailed design, analysis strategy, expected outcomes, and possible pitfalls/alternative strategies.
- Be 4-5 single-spaced pages (0.5—1 inch margins, 11-12pt Helvetica or Arial font).
- Be convincing; we should get excited and want to fund your proposed research!

Detailed instructions for each submission will be available on Canvas.
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<th>Week</th>
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<th>Topic</th>
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<td>Week 4</td>
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<td>Week 5</td>
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<td>Week 6</td>
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<td>Working memory/Cognitive control + TMS methods</td>
<td>1 page draft due</td>
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<td>Week 7</td>
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<td>Reinforcement learning/Decision making + model-based methods</td>
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<td>Week 8</td>
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<td>Discovering “Processes”: Functional connectivity methods</td>
<td>Semi-final draft due</td>
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<td>Week 9</td>
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<td>No class (Memorial day)</td>
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<td>Discovering “Representations”: MVPA methods</td>
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<td>Final project due</td>
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