This is a graduate level course. Junior or Senior undergraduates may sign up with consent of the instructor.

Description

This will be a Graduate Research Seminar covering basic and applied research relevant to the study of human expertise, human decision-making, as well as decision-making expertise. As a graduate research seminar, you are NOT expected to have prior familiarity with all domains covered, research designs used, statistical analysis methods, types of modeling, or so on but you will be expected to supplement the readings as needed (e.g., with the help of google, the Wikipedia, journal papers, and so on) to provide yourself with a minimal acquaintance as needed. Of necessity, as we are attempting to understand human expertise from a cognitive science perspective, about a third of our weeks will focus on leading edge cognitive science theories relevant to predictive processing, memory, decision-making, motor control, and other aspects of cognitive science. It will often be left up to us to make the connections btw those theories and skilled or expert task performance in particular domains. Although this seminar is being offered by the Cognitive Science Department, students from all other departments of Rensselaer are invited and their contributions will be cherished. However, seats are limited so as to preserve the small group nature of the weekly discussions. Those outside of Cognitive Science should contact the instructor prior to registering. Finally, the syllabus may change during the semester with new readings being added and old ones pruned. Keep your eye on: http://homepages.rpi.edu/~grayw/courses/syllabi/nFa2019--Expertise&Decision-Making/ for more information.

DETAILS OF CLASS STRUCTURE [Complete details will be provided in the syllabus; however, as these details do not change much from semester to semester, please see the syllabus
from Spring 2019 for a general idea: http://homepages.rpi.edu/~grayw/courses/syllabi/m%20Sp2019%20--%20Aging%20&%20Expertise/}
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Week 1  08/29: EXPERTISE VIEWED FROM OUTSIDE COGNITIVE SCIENCE

[Nothing written is due but please come to class having read all three papers and please bring some talking points with you.]


Week 2  09/05: THURSDAY BEFORE GORDON LOGAN’S WEDNESDAY VISIT

[All Responses are due by 6:00 pm the TUESDAY before class.]

All read and write a one page (max) Response paper for each:


Paper presentations by . . . :


Week 3  09/12: INFO PROCESSING AND/OR DYNAMICS

All read and write a 1.5 pages (max) Response paper for:


Paper presentations by . . . :


**Week 4  09/19: EYE MOVEMENTS FOR STUDIES OF FUNCTIONAL COGNITION**

All read and write a 2 page (max) Response paper for:


Paper presentations (max 2 this week) by . . .:


**Week 5  09/26: IDEOMOTOR THEORY – PREQUEL TO PREDICTIVE PROCESSING**

All read and write a one page (max) Response paper for:


Paper presentations by . . .:


**Week 6  10/03: IS PRED PROC RADICAL?**

All read and write a 1 page (max) Response paper for:


Paper presentations (max 2 this week) by . . .


**Week 7  10/10: HOW RADICAL IS PRED PROC? – part 1**

All read and write a 1 page (max) Response paper for each:


Paper presentations by . . .


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**CTWC - Portland**

*No class on October 17th*
Week 8  10/24: HOW RADICAL IS PRED PROC? – part 2
All read and write a one page (max) Response paper for:


Paper presentations by . . . :


- **?who?** – ?what?

Week 9  10/31: JOINT ACTION PAPERS – Near the Beginnings
All read and write a 1.5 page Response paper for:


Paper presentations by . . . :


Week 10  11/07: JOINT ACTION PAPERS – part 2
All read and write a one page (max) Response paper for:


Paper presentations by . . .


Week 11 11/14: JOINT ACTION – part 3 – most relevant to JAG: Joint Action Games

All read and write a one page (max) Response paper for:


Paper presentations (max 2 this week) by . . .:


• who? – TBD
Week 12  11/21: DYNAMIC SYSTEMS IN DRIVING

All read and write a one page (max) Response paper for each:


Paper presentations by . . . :

- **who?** – what?

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**THANKSGIVING**

No class on November 28th

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Week 13  12/05: STONE TOOLS

All read and write a one page (max) Response paper for each:


Presentations this week by . . . :

- **?who?** – ?what?
Week 14  12/12: PRECISION PSYCHIATRY & GAME-XP


Presentations this week to be added . . . :

- who? – TBD
- who? – TBD

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**REQUIREMENTS**

90  REQUIREMENTS

90.1 PreRequisites

Permission of the instructor. This is a graduate research seminar in the Cognitive Science Department. However, all interested undergraduates and interested graduate students from other departments are encouraged to contact the instructor to discuss their participation in the seminar. Responsibilities and assignments for undergraduates will be discussed and agreed on, in writing, by the student and the instructor.

90.2 About the Instructor

Professor Gray has been a member of the Cognitive Science Department at RPI since the Fall of 2002. For details on his research interests and activities see his homepage.

90.3 Activities

Reading, Writing, Presenting, Discussing

- Group discussion.

  - The most important contribution each person can make is to our discussions of the readings. I believe a seminar course in which everyone actively participates can be the most productive and educational forum in grad school (often for the instructor as well). Bringing together the various backgrounds and training of everyone in the
room generally leads to a much richer perspective than would otherwise be possible. There is a lot of individual variability in tendency to speak up in this type of environment, but it is critical to an academic career to be comfortable doing so. You cannot succeed in this field without a willingness (and desire) to share your ideas in the face of criticism, and this is perhaps the best context to practice. If you are someone who has no qualms about dominating a debate, this is also a good place to practice restraint and listening.

- Students (graduate and undergraduate) will take a turn leading a discussion of each week’s core assigned readings. Advanced preparation for this includes the Response Paper for that week’s readings.

- Response Papers
  - **NEW for FALL 2019!** We will experiment with different ways of discussing the Response papers. In past seminars, I was the only person who read any of the student Response papers. This semester I will share that responsibility with each of you.
  - As in past seminars, each week all students will write response papers to the readings.
  - As in past seminars, those papers are due by 5:00 pm on the Tuesday before class.
  - **Different from past semesters, each student will upload their Response paper to that week’s DropBox (I will send the entire class that link each week).**
  - Same as last semester, be sure to put your name on your paper!!!
  - **Also different from past semesters,** I will assign each paper to one other student to read as its reviewer. Hence, each week, each of you will be a reviewer and a reviewee.
  - The Review: Your reviews are not detailed. Rather, the purpose of your review will be to pull out interesting points and/or address issues raised in the response paper you have read. In doing so, you will rely on your knowledge of the Review paper.

- Paper presentations. **Research papers only — NO REVIEW PAPERS.**
  - Each week, one to three students will each present a research paper selected by the instructor as relevant to that week’s topic. Generally, just one student will read and present each research paper. The number of presentations per student will be inversely proportional to class size (which is topped at 10 students).
  - **NEW for FALL 2019!** We distinguish between papers that primarily report original research (Research Papers) and ones that primarily review and/or integrate already published research (Review Papers). The focus of the Paper Presentations is on Research Papers — REVIEW PAPERS CANNOT BE CHOSEN FOR PRESENTATION. My goal is to have you become familiar with the jargon and conventions of research papers across the wide swath of cognitive science research most relevant to humans.
In general, each presentation should be 20-25 minutes long and structured as though you were presenting your own work at a conference. A useful strategy is to copy key figures and tables out of each article and supplement with (scant) text stating the major points. Focus on summarizing the research, as the authors present it (including motivation, background, methods, results, and conclusions), but also allow us to hear your voice as well – however, be sure we know when the author is speaking and when you are speaking.

Undergraduate presentations.

As this is a communication intensive course, I will be asking our undergraduates (if any) to also do presentations. These will be fewer in number than the graduate student assignments; however, I will encourage each undergraduate to prepare her/his presentation a week in advance, in time for it to be delivered in a practice session to me or to one of the senior graduate students. This extra meeting is intended as a "practice" session to get you comfortable with this type of presentation.

91 Grading Policy

- Examinations – none
- Group Discussion
  - 35% Grad Students; 45% Undergrads
  - For active participation in all discussions on all weeks in which the seminar is held. Exceptions due to professional travel or other activities need to be discussed with the instructor ahead of time.
- Response Papers
  - 35% Grad Students; 45% Undergrads
  - Prior to each week’s meeting, one or more readings will be assign and, for each reading, all students are expected to write a short, one-page Response Paper. The Response Paper should not merely summarize or outline the assigned reading but should reflect your thoughts on the author’s arguments, the strength of evidence, alternative hypotheses, implications, and so on.
  - Response papers are due to the Instructor by 5:00 pm the day before the seminar.
- Presentations
  - 35% Grad Students; 15% Undergrads
  - Throughout the semester, an average of one or two students each week will be asked to present the findings of a published research paper, assigned by the instructor. The presentation should be in the range of 20-30min. The student should assume the role of the paper’s author and present the case made by the author in her paper. Use of figures, tables, and headings from the paper is encouraged, as well
as original visualizations created by the student, as appropriate. The student may also step out of their role as “surrogate author” for various “meta” comments on the material but should, generally, maintain and represent the case made by the original author in her paper.

- Yes. I expect 105% out of you!

92 Honors Policy

- My expectation is that all of the work you do for me in this class will be the work of one individual. Exceptions to this rule will be broadcast to the class by email.

- As you will all find out, I explicitly encourage you to engage in public (using email and other media to broadcast a message to the entire) or private (one-to-one) discourse regarding the readings and topics raised in this class. Study groups are encouraged.

- If any of you have any questions regarding current situations or future situations, remember that I am your first contact on this. Please come and see me.
93 References


This document contains 50 references.