

PSY 717 (001)
COGNITIVE METHODS

(1) COURSE DESCRIPTION AND OBJECTIVES

LEARNING GOALS:

The primary goal of this course is for students to gain exposure and to learn how to use and apply research methods that are commonly used by cognitive psychologists. The course will begin with an examination of basic methods and techniques and will also consist of learning practical skills, such as programming experiments and working with data. Students will learn about specific techniques like eye tracking, event-related potentials, and imaging that can be used to take different perspectives on cognitive processing. Finally, the course will conclude with an evaluation of these different methods where we will tackle questions such as, "Should research be guided by the methods that one has available to him or her?"

Specific learning objectives:

Students will learn to apply research methods to address questions in cognitive psychology.
Students will learn to utilize practical skills for designing cognitive experiments.
Students will learn to use eye tracking to examine cognitive processing.
Students will learn to evaluate event-related potentials for purposes of investigating cognitive processes.
Students will understand imaging techniques to understand diverse brain functions.

The class will be based on a combination of discussions, short lectures, demonstrations, and hands-on exercises. At the completion of this course, students should be knowledgeable of the methods used by cognitive researchers, have experience with specific methods that they can use, as well as an understanding of ways to evaluate the strengths and weaknesses of various methods.

RECOMMENDATIONS:

- | | |
|---------------------------------------|--|
| -Attend class and ask questions | -Complete assigned readings before class |
| -Apply the knowledge & skills learned | -Attend class and ask questions |

Students at the graduate level should understand that while every effort is made by the instructor to promote learning, how much is learned or taken from a course is up to how much time and effort a student puts into it. It is recommended that students do their part to enhance learning – read critically before class, add to discussions, and to actively participate in exercises. If at any point, you are having difficulties with a concept, or of applying a particular skill, please see me immediately.

WEBCAMPUS:

This course uses WebCampus for a number of useful functions:

- | | |
|--------------------------------------|---|
| -email communication | -posting a copy of the syllabus |
| -posting information about exercises | -a calendar with important dates |
| -posting grades | -a forum for student questions/discussion |

You can access WebCampus on the internet at: <http://webcampus.nevada.edu>. There are instructions on the WebCampus website as to how to register and logon. If you are having any problems with WebCampus, please let me know right away. To stay up-to-date, I recommend logging in at least twice a week. Note: A frequent problem that students encounter is an inability to download certain files. Use Adobe Reader for pdf files and Microsoft Office for Word documents or PowerPoint files.

(2) COURSE REQUIREMENTS AND EVALUATION

PAPER:

Students will complete a 15 page paper applying two different cognitive methods to their research (students should select methods they have not used before). Papers will be graded on proper descriptions of a method, clear descriptions of what could be learned from using them, as well as the general quality of writing. To help improve the quality of the papers, students will also complete peer reviews. The paper is worth 50 points and the peer review is worth 5 points.

PRESENTATION:

To practice presentation skills, and to show the class the methods applied to one’s research, students will give a brief 10-15 minute conference style presentation of their paper. Presentations are worth 10 points.

LEADING DISCUSSION:

During the semester, each student will lead discussion. This task includes an introduction of the topic, organizing questions, finding additional sources / material, preparing demonstrations, and maintaining the discussion. This is worth a total of 20 points.

PARTICIPATION:

Because graduate courses depend on the active involvement of students, as an incentive to participate, students will receive credit for their participation. This is worth a total of 15 points. Typically, someone who is actively involved (e.g., asking/answering questions, discussing, etc.) will earn 14 or 15 points. Someone who is moderately involved will earn 12 to 13 points. Finally, people who are rarely involved will earn fewer points. Frequent absences will result in a much lower participation score.

(3) COURSE GOALS, GRADING, & POINT BREAKDOWN

Course Goals: (1) Appropriate description, understanding, and application of methods in paper
(2) Successful involvement in class discussion and activities

What Grades Symbolize: A: student clearly met the course goals
B: student’s performance was lacking for at least one of the course goals
C: student was able to achieve some of the goals, but not to a high degree
D: student was not able to adequately achieve course goals
F: student’s performance was clearly lacking for most or all of the course goals

Participation	15 points
Leading Discussion	20 points
Peer Review	5 points
Presentation	10 points
Paper	50 points
TOTAL:	100 points

A	93 & ↑	C+	77 – 79
A-	90 – 92	C	73 – 76
B+	87 – 89	C-	70 – 72
B	83 – 86	D	60 – 69
B-	80 – 82	F	59 & ↓

IMPORTANT DATES:

Paper Draft Due: 4/24 Peer Review Due: 5/01 Final Paper Due: 5/08 Drop Date: 4/04

NOTES ON GRADING

Psychology graduate students must earn a grade of “B-” or better for a course to count toward the Master’s or Doctoral degree. The last day to drop/withdrawal from a class without academic penalty is Friday, April 4. Finally, grades are earned based on student performance and demonstration of learning – thus, they are not negotiable. However, if an error is detected, please bring it to the attention of the instructor.

ACADEMIC HONESTY:

Copying from others or using ideas from published articles without appropriate citations and references is not acceptable. Students who copy or plagiarize will receive a zero on the work and possibly an F in the course. If at any point you are unsure what is considered plagiarism, please ask the professor.

STUDENTS WITH DISABILITIES:

The UNLV Disability Resource Center (DRC) houses the resources for students with disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137. Their numbers are: (702) 895-0866/Voice; (702) 895-0652/TDD; and (702) 895-0651/Fax. For additional information please visit: <http://www.unlv.edu/studentlife/drc>.

WRITING CENTER:

One-on-one or small group assistance with writing is available free of charge to UNLV students at the WritingCenter, located in CDC-301. Drop-in times are available but students with appointments have priority (phone: 895-3908; website: <http://writingcenter.unlv.edu>). Please bring a copy of your assignment, two copies of your work (one for you and one for the consultant), and your Rebel ID Card.

CELL PHONES AND OTHER GADGETS:

Distracting technological devices such as cell phones are not permitted to be out or used during class time (laptops are acceptable). People should not make calls, answer calls, or text message during class. In the case of an emergency (e.g., family member in the hospital), please talk to me before class.

READING LIST:

Batchelder, W.H., & Riefer, D.M. (1999). Theoretical and empirical review of multinomial process tree modeling. *Psychonomic Bulletin & Review*, 6(1), 57-86.

Boldini, A., Russo, R., & Avons, S.E. (2004). One process is not enough! A speed-accuracy tradeoff study of recognition memory. *Psychonomic Bulletin & Review*, 11(2), 353-361.

Conway, A.R.A., Kane, M.J., Bunting, M.F., Hambrick, D.Z., Wilhelm, O., & Engle, R.W. (2005). Working memory span tasks: A methodological review and user's guide. *Psychonomic Bulletin & Review*, 12(5), 769-786.

Donaldson, W. (1992). Measuring recognition memory. *Journal of Experimental Psychology: General*, 121(3), 275-277.

Frey, A., Hartig, J., Ketzler, A., Zinkernagel, A. & Moosbrugger, H. (2007). The use of virtual environments based on a modification of the computer game Quake III Arena in psychological experimenting. *Computers in Human Behavior*, 23, 2026-2039.

Goddard, R.D., & Villanova, P. (2006). Designing surveys and questionnaires in research. In F.T.L. Leong, J.T. Austin (Eds.), *The Psychology Research Handbook: A Guide for Graduate Students and Research Assistants* (pp. 114-124). Thousand Oaks: Sage Publications.

Green, C.D. (1992). Of immortal mythological beasts: Operationism in psychology. *Theory & Psychology*, 2, 291-320.

Grimshaw, G.M., Bulman-Fleming, M.B., & Ngo, C. (2004). A signal-detection analysis of sex differences in the perception of emotional faces. *Brain and Cognition*, 54, 248-250.

- Huettel, S.A., Song, A.W., & McCarthy, G. (2004). *Functional Magnetic Resonance Imaging* (pp. 1-26). Sunderland, MA: Sinauer Associates.
- Kirk, E.P. & Ashcraft, M.H. (2001). Telling stories: The perils and promise of using verbal reports to study math strategies. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *27*(1), 157-175.
- Kuhn, T.S. (1996). *The Structure of Scientific Revolutions*. Chicago, IL: The University of Chicago Press.
- Lounsbury, J.W., Gibson, L.W., & Saudargas, R.A. (2006). Scale development. In F.T.L. Leong, J.T. Austin (Eds.), *The Psychology Research Handbook: A Guide for Graduate Students and Research Assistants* (pp. 125-146). Thousand Oaks: Sage Publications.
- Luck, S.J. (2005). *An Introduction to the Event-Related Potentials Technique*. Cambridge, MA: The MIT Press.
- McGuire, W.J. (1997). Creative hypothesis generation in psychology: Some useful heuristics. *Annual Review of Psychology*, *48*, 1-30.
- Medin, D.L., & Atran, S. (2004). The native mind: Biological categorization and reasoning in development and across cultures. *Psychological Review*, *111*(4), 960-983.
- Mulholland, P., & Watt, S. (2005). Symbolic modeling. In N. Braisby (Ed.), *Cognitive Psychology: A Methods Companion* (pp. 69-104). Oxford: Oxford University Press.
- Rayner, K. (1998). Eye movements in reading and information processing: 20 years of research. *Psychological Bulletin*, *124*(3), 372-422.
- Sternberg, R.J. (2003). *Psychologists Defying the Crowd: Stories of those who battled the establishment and won*. Washington D.C.: American Psychological Association.
- Takatalo, J., Nyman, G., & Laaksonen, L. (2008). Components of human experience in virtual environments. *Computers in Human Behavior*, *24*, 1-15.
- Ulrich, R., & Miller, J. (1994). Effects of truncation on reaction time analysis. *Journal of Experimental Psychology: General*, *123*(1), 34-80.
- Uttal, W.R. (2003). *Psychomythics*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Van Selst, M., & Jolicoeur, P. (1994). A solution to the effect of sample size on outlier elimination. *Quarterly Journal of Experimental Psychology*, *47A*(3), 631-650.
- Vaux, A., & Briggs, C.S. (2006). Conducting mail and internet surveys. In F.T.L. Leong, J.T. Austin (Eds.), *The Psychology Research Handbook: A Guide for Graduate Students and Research Assistants* (pp. 186-209). Thousand Oaks: Sage Publications.
- Whitehead, L.C. (2007). Methodological and ethical issues in internet-mediated research in the field of health: An integrated review of the literature. *Social Science & Medicine*, *65*, 782-791.

TENTATIVE SCHEDULE:

Date	Topic	Reading
1/23 – TH	Intro to Course	
1/30 – TH	Review of Research Designs / Hypotheses / Measurement	McGuire (1997) Kirk & Ashcraft (2001); Boldini et al. (2004)
2/06 – TH	Common Measures & Scoring / Signal Detection Analyses	Conway et al. (2005) Donaldson (1992); Grimshaw et al. (2004)
2/13 – TH	Programming Basics / Excel Macros / E-Prime	
2/20 – TH	Qualtrics & Other Experimental Software	
2/27 – TH	Eye Tracking	Rayner (1998)
3/06 – TH	Virtual Environments / Brain Imaging	Frey et al. (2007); Takatalo et al. (2008) Huettel et al. (2004)
3/13 – TH	Event Related Potentials	Luck (2005) – Ch 1 & Ch 8
3/20 – TH	SPRING BREAK – NO CLASS	
3/27 – TH	Surveys & Scales / Internet Research	Goddard & Villanova (2006); Lounsbury et al. (2006) Vaux & Briggs (2006); Whitehead (2007)
4/03 – TH	Symbolic Modeling / Tree Modeling	Mulholland & Watt (2005) Batchelder & Riefer (1999)
4/10 – TH	Operational Definitions / Data Trimming	Green (1992) Ulrich & Miller (1994); van Selst & Joliceaur (1994)
4/17 – TH	Graphing in Excel & SPSS / Peer Reviews	
4/24 – TH	Paradigm Shifts in Research	Kuhn (1996)
5/01 – TH	Diversity, Individual Differences Evaluation & New Methods	Medin & Atran (2004) Sternberg (2003); Uttal (2003)
5/08 – TH	Presentations	
5/13 – T	FINAL EXAM (10:10 AM)	