

**PSY 734: Mental Workload Theory & Applications Seminar
Fall 2011**

**Thursday: 10:30 am-1:10 pm
Arch Lab Conference Room**

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Office hours: Tuesdays and Thursdays 2:30-3:30 pm and by appointment (you are encouraged to email me or talk to me after class about meeting at other times)

Main text: Wickens, C., & McCarley, J. S. (2008). *Applied Attention Theory*. Clermont, FL: CRC Press.

Additional Required Readings: See Readings List

Course Description:

This seminar will focus on the theories and applications of mental workload assessment. We will cover issues surrounding development of the concept and both early and contemporary theories and models of mental workload. An emphasis will be placed on selection of workload assessment techniques based on the purpose of assessment and the environment in which it will take place. Thus, in addition to discussing theories and techniques of assessment, a focus will be placed on application of the existing literature in this area. Key topics will include: Mental Workload definitions and constructs, Early Attention & Resource Theories, Methods of Assessment – Behavioral, Physiological, Subjective, Contemporary Theories and Models of Workload -Information Processing Models, Computational, Neurophysiological, Automation & Workload, Adaptive Automation
Vigilance, Workload Transition, Affects of Aging, and Areas of Applications.

Grading System:

Major Project Oral/Written Draft	1 @ 50	= 50
Major Project Final Written Manuscript	1 @ 100	= 100
Major Project Final Oral Presentation	1 @ 50	= 50
Article Discussion Lead	1 @ 25	= 25
Application/Midterm Exam	1 @ 55	= 50
Final Comprehensive Exam	1 @ 100	= 100
Participation & Discussion		= 75
	TOTAL POINTS	450 points

Grading Scale:

Superior/Excellent: 97 -100% = A+ 93-96% = A 90-93% = A-
Above Average: 87 - 89% = B+ 83-86% = B 80-82% = B-

Average: 77 - 79% = C+ 73-76% = C- 70-72% = C-
 Failing: 59 and below

Policies, Procedures, Philosophy & Expectations

- 1) First and foremost, it is my hope that together we can create a learning atmosphere conducive to intellectual discovery and growth. We all have something to bring to the discussions and with mutual respect for each other we can all learn.
- 2) Critically read all assigned material prior to the day it is to be discussed. Come to class ready to participate in discussions of the material, exercises to strengthen learning and with thoughtful questions and insights for further learning. Refer to the Readings calendar for a list of dates for articles/chapters to be covered.
- 3) Article discussions: You will be in charge of discussing critical aspects of three of the assigned articles and leading the class in discussion of the topic involved. (Critical aspects for research investigations include: rationale for the study, methodology, results, discussion, and implications & limitations. Critical aspects for review papers and chapters include such items as: nature of the debate or issue, supporting evidence for diverse views, design of a debate resolving investigation, gaps in the literature, etc.) You should plan to present your portion of the reading for 10-15 minutes – using power point slides, handouts, discussion questions, demonstrations, etc...
- 4) Literature Review paper: Complete and independent literature review on a topic related to psycholinguistics. Papers should be 10-15 pages in length, APA style, include at least 15 references (10 should be from journal articles published 1995 or later). Present a 20-30 minute summary of this literature review in class.

Sample Course/Lecture Schedule*

PSY 734: Mental Workload Seminar
 Readings List

Prerequisite Readings (I'm assuming you have read these already, if not – please do so ASAP).

(Wickens, 1984) (Cherry, 1953) (Baddeley & Hitch, 1974)

Date	Topic	Assignment/Reading
September 1 st	Syllabus, Assignments & Course Overview; Early Attention & Resource theories; Overview of Assessment Techniques	////////////////////
September 8 th	Resources theories, Assessment techniques, & Behavioral Measures	(Eggemeier, 1988; Gopher & Donchin, 1986)
September 15 th	Dual Task Methodologies (Auxiliary, subsidiary & loading tasks, POCs)	(Ogden, Levine, & Eisner, 1979; Verwey & Veltman, 1996)
Sept. 22 nd	Physiological Assessments	(Kramer, Sirevaag, & Braune,

		1987) (Wierwille, 1979)
Sept. 29 th	Subjective Assessments	(Hart & Staveland, 1988; Rubio, Diaz, Martin, & Puente, 2004)
Oct. 6 th	Theories & models (info processing, computational & neurophysiological)	(Horrey & Wickens, 2003; Wickens, 2002; Young & Stanton, 2002)
October 13 th	Drafts of Final Projects due	////////////////////
October 20th	Midterm Examination	
October 27 th	Automation & workload (adaptive systems)	(Freeman, Mikulka, Scerbo, & Scott, 2004; Wilson & Russell, 2007)
Nov. 3 rd	Workload Transition & vigilance	(Executive Summary, Huey & Wickens, 1993; Warm, 1993)
Nov. 10 th	Applications (i.e., drivers, pilots, medical personnel, aging, HCI, product design)	(Andre, Hancock, & Desmond, 2001; Wierwille, Rahimi, & Casali, 1985)
Nov. 17 th	Current debates & issues	(Boles, Bursk, Phillips, & Perdelwitz, 2007; Parasuraman & Rizzo, 2007; Wickens, 2007)
Nov. 24 th	No Class – Thanksgiving Break	Project Presentations
December 1 st		Project Presentations
December 8 th	Last Class	Project Presentations (Final Project Papers Due)
December 15th	Final Exam 10:30 am – 1:15 pm	

Additional Resources & Suggested Readings

Early Attention & Resource Theories

(Lavie, 2005; Lavie, Hirst, de Fockert, & Viding, 2004)
(Norman & Bobrow, 1975)

Secondary Task measures

(Knowles, 1963; Recarte & Nunes, 2003) (Verwey, 2000; Verwey & Veltman, 1996)

Physiological measures

(Baldwin, 2003; Baldwin & Coyne, 2005; Gevins, Smith, McEvoy, & Yu, 1997; Parasuraman & Caggiano, 2005)

Subjective measures

(Nygren, 1991; Reid & Colle, 1988; Reid, Nygren, Hancock, & Meshkati, 1988)

Contemporary Theories and Models of Workload – Information Processing Models, Computational, Neurophysiological

(Gevins & Smith, 2003; Halford, Baker, McCredden, & Bain, 2005; Halford, Wilson, & Phillips, 1998; Veltman, 2003)

Applications

Workload Redlines

(Colle & Reid, 2005)

(Zeitlin, 1995)

Workload Transition

(Desmond & Hoyes, 1996; Hancock, Williams, Manning, & Miyake, 1995)

Automation & Workload

(Harris, Hancock, Arthur, & Caird, 1995; Parasuraman & Hancock, 2001)

Crossmodal Spatial Attention

(Shomstein & Yantis, 2004; Spence & Read, 2003)

References

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- Boles, D. B., Bursk, J. H., Phillips, J. B., & Perdelwitz, J. R. (2007). Predicting Dual-Task Performance with the Multiple Resources Questionnaire (MRQ). *Human Factors*, 49(1), 32-45.
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*The instructor reserves the right to change lecture dates, assignments, and assigned readings as deemed necessary.