Syllabus for PSYC 592 (001) – Fall 2017
Special Topics: Cognitive Electrophysiology

Instructor: Dr. Craig McDonald
E-mail address: cmcdona3@gmu.edu
Laboratory TA: Paul Beatty
TA E-mail address: pbeatty@gmu.edu

Class time: R 4:30-7:10 pm
Class location: Hanover Hall L003
Office hours: T 2:00-3:00 pm & by appt.
Office phone #: 703-993-2277
Office location: DK 2057

Recommended Text:

- S.J. Luck (2014) An Introduction to the Event-Related Potential Technique, 2rd Ed., MIT Press.
- Stormy Attaway (2009) MATLAB: A Practical Approach, Elsevier.

Required Software: MATLAB Programming Environment (MathWorks, Natick, MA)

Deadlines: Last Day to Add – September 5; Last Day to Drop – September 29

Goals and Course Description:

The goal of this course is to provide students with scholarly resources to be able to evaluate and conduct electrophysiological research. Students will gain an understanding of how questions about human cognition can be answered using electroencephalography (EEG) and the event-related potential (ERP) technique, as well how to implement the appropriate experimental designs and analytical techniques to best answer those questions. A secondary goal of this course is for students within the social sciences to learn how to write scripts using the MATLAB programming environment to enable them to seamlessly organize and analyze complex datasets. The course will provide an overview of various functions and syntax with regard to MATLAB's coding structure, introduce students to a variety of open-source toolboxes, and permit students to gain hands-on experience with analyzing electrophysiological datasets.

Assignments:

Discussion/Readings:

All students must read the article/chapter ahead of time and be prepared to take part in the class discussion. Your contribution to class discussions is part of your grade. To facilitate class discussion, each student will post, in advance, a question or comment on the assigned readings. The comment should be posted on the designated Blackboard discussion thread at least 24 hours prior to the date and time of the assigned discussion.

Paper:

Students will propose an experiment that will utilize EEG/ERPs. The proposed experiment should be aimed at providing new insight into an aspect of human cognition. The paper will take the form of an introduction and methods section of a scientific manuscript.

MATLAB Practicum:

Students will solve a series of problems in MATLAB to demonstrate the required coding knowledge to be able to analyze an EEG dataset. The assignment will be posted on Blackboard towards the beginning of the semester. You are welcome to complete this assignment ahead of the scheduled due date, but many of these problems will be difficult to solve until we cover the material. Please refer to supplementary handout for additional information.

EEG Practicum:

Students will form a small group and utilize what they have learned during the theoretical and applied segments of the course to process an electrophysiological data from start to finish. Students will be evaluated based on the completion of three main criteria: data collection, data processing, and data analysis. Please refer to supplementary handout for additional information.

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Grading:

Assignments		
	Paper	30%
	MATLAB Practicum	30%
	EEG Practicum	10%
Class Participation		
	Class Discussions	30%
Total		100%

Letter Grades:

A (90-100%), A- (85-89%)

B+ (80-84%), B (75-79%), B- (70-74%),

C+ (65-69%), C (60-64%), C- (55-59%),

D (50-54%), F (below 50%)

Honor Code:

Students are reminded of the university honor code and are expected to adhere to the principles thereof.

Official Communications via GMU E-Mail:

Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account, and are required to activate that account and check it regularly.

Class Cancellation Policy:

In the event that class is cancelled, students will be notified via email and post an announcement on Blackboard. In addition, students will be notified if any changes are made to the course schedule.

Policy Regarding Late Assignments:

Permission to postpone an exam or to turn in an assignment late will only be given for very important and acute reasons. The student must obtain my prior consent to postpone an assignment or has written medical documentation for absence from a quiz or other assignment. Any documentation required for excused absences MUST be turned in by the following class.

Technology Statement:

Required knowledge of technology for this course includes ability to retrieve handouts sent via email to your GMU address or posted on Blackboard (mymason.gmu.edu). Occasionally I may use computer programs or the Internet in class to present demonstrations of relevant material.

Special Needs:

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 703-993-2474. All academic accommodations must be arranged through that office.

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Tentative Schedule:

Date	Reading	Topic
Aug 31	Luck Chapter 1	Introduction
Sept 7	Luck Chapter 2	Neural Basis of ERPs
Sept 14	Luck Chapter 3	Overview of Common ERP Components
Sept 21	Luck Chapter 4	Designing and Conducting ERP Studies
Sept 28	Chapters 6 & 7	Signal Processing of ERPs
Oct 5	Luck Chapters 9 & 10	Quantifying and Statistically Analyzing ERP Components
Oct 12	-	An Introduction to ERSP
Oct 19 _____ Oct 26	Attaway Selected Readings 1.2 Variables and Statements 1.3 Expressions 1.5 Vectors and Matrices 2.2 MATLAB Scripts 2.6 Input/Output (Load and Save) 3.1 Relational Expressions 3.2 The if Statement 3.3 The if-Else Statement 3.4 Nested if-Else Statement 4.1 The for Loop 4.2 Nested for Loops 4.4 While Loops 6.1 Creating String Variables 6.2 Operations on Strings 6.4 Converting Strings 7.1 Cell Arrays 7.2 Structures 8.2 Writing/Reading Spreadsheets 8.3 MAT-Files 12.1 Statistical Functions 12.3 Sorting 12.4 Indexing	Introduction to MATLAB Seminar _____ Introduction to MATLAB Seminar (Continued)
Nov 2	EEG Data Collection Procedure Handouts	EEG Practicum 1
Nov 9		EEG Practicum 2
Nov 16		EEG Practicum 3
**MATLAB Practicum Assignment Due November 16 – 11:59pm		
Nov 23	NO CLASS – Thanksgiving Break	
Nov 30	EEGLAB Tutorial	Introduction to EEGLAB
Dec 7	Selected Scripts/Handouts	Advanced Analysis Techniques

** ***NOTE:*** **You are responsible for all announcements and any syllabus modifications made in class each week whether you are present or not.**