

The University of Western Ontario

Psych 9224a
Introduction to event-related potentials
and electroencephalography methods

Course Outline

1. Course Information

Class meets in WIRB 1130
Wednesdays 9:00-12:00

Event-related brain potentials (ERPs) can provide fine-grained information about cognitive, perceptual and affective processes in real time. They are acquired as electrical potentials on the scalp using EEG, or electromagnetic fields around the head using MEG. The purpose of this course is to acquaint students with these techniques at both the technical and conceptual levels, focusing primarily on ERPs recorded via EEG. The course format will be a combination of lectures and discussions of journal articles. Technical topics will include: ERP and MEG instrumentation and techniques; data processing, filtering and analysis; source localization; experimental design. Research topics will be set based on student interest, and may include: perceptual processes; attention; speech and language; memory; high- and low-level vision; affective and emotional processing; special populations. Hands-on experience with data acquisition and processing will also be provided.

2. Instructor Information

Marc Joanisse
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3. Course objectives

By the end of this course students will be able to critically read articles pertaining to EEG techniques (including ERP and MEG) and understand how they pertain to the area of inquiry. In addition, students will learn to design, run and analyze their own ERP study that examines questions pertinent to their area of research.

Students are expected to read both the assigned texts before each class; attend classes and participate fully in discussions; lead an in-class discussion; participate in the lab assignments and complete a number of take-home assignments; and complete a term paper consisting of a literature on a selected topic and an experiment proposal designed to advance our knowledge of that area of inquiry.

4. Course Materials

Copies of all readings will be provided on Owl. Students may wish to purchase *An Introduction to the Event-Related Potential Technique* (Luck, 2nd Ed, MIT Press), as we use it extensively in the course and is a useful reference.

5. Methods of Evaluation:

Class participation/presentation: 20%

You are expected to attend all lectures and lab sessions. You are also required to participate fully in the in-class discussions. Students should arrive in class with at least two questions/comments pertinent to the readings. The instructor reserves the right to assign pop quizzes or thought papers to test understanding of the materials in cases when participation is low.

If you cannot attend a class, you will be expected to turn in a 2-page précis of each assigned reading in order to make up for your absence. Missed lab sessions cannot be made up and will be handled on a case-by-case basis.

Each student will lead a 45-60-minute discussion on a journal article, ideally on a topic that is of some interest to them and on a topic for which they have some expertise. **Note that leading a discussion does not mean summarizing the article**, since everyone will have read it. Instead the discussion should focus on the theoretical background of the topic, technical issues that arise, critique the approach that is taken, and discuss what is learned by applying ERP techniques to the question at hand.

Assignments: 40%

Take-home assignments will ask you to analyze single-subject and group data. They will make use of MATLAB and two free add-ons: EEGLab and ERPLab. Each assignment will take 1-2 hours to complete.

Final paper: 40%

The final paper will be due in December and will take the form of a ~25 page research proposal. The topic is completely at your discretion, although I hope you will consult with me beforehand to assure that the topic is appropriate to the course. Full details on this will be provided in mid-October.

6. Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).