Course Objectives:
You will learn about a variety of research tools, techniques, and strategies, in order to gain a general knowledge of available methods for addressing developmental research questions. You will learn about neural (EEG, ERP, MEG, fMRI, PET, SPECT, DTI, TMS), behavioral (RT, accuracy, eye movement), quantitative (SEM, MANCOVA, hierarchical regression), and model-based (mathematical, connectionist) methodology. You will evaluate hypotheses and theories, in order to determine which methods are most useful for answering specific research questions.

Because a key part of this class is weekly discussions, class attendance is expected. If you plan to miss a class, please notify the course director in advance.

Grading:
20% Leading class discussions
40% Methodology and experimental design paper
20% Feedback on peer paper drafts
20% Participation

Conversion of Percents to Letter Grades:

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<th>Percentage</th>
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<td>85-89</td>
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<td>7</td>
<td>60-64</td>
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Readings:
Weekly readings will be assigned, mostly consisting of journal articles and book chapters. Readings should be completed prior to attending class.

Class Discussion:
You will lead discussions on course topics. Topics will be chosen during the first class, and ideally you should pick a topic relevant to your own research.

Methodology and Experimental Design Paper:
You will write a paper that describes a research project of interest to you, especially focusing on the methodology you will use to address your research question(s). While it is not required that you describe a developmental topic or ask developmental questions, doing so is preferable. Length of the paper is flexible, with an estimated average of 30 pages. The paper should (a)
briefly overview the topic, (b) include a detailed method section that uses novel (to you) methodology, (c) address an open question about your topic, and (d) describe how the methodology contributes to advancement of your research question(s). You will provide feedback on peer paper drafts.

Although you are encouraged to use other papers in strong field-specific journals (e.g., Psychophysiology) as guides for the relevant information to include, do not simply copy method sections from other articles. Your method section should demonstrate your knowledge of key parameters for a given technique and technique-specific design issues. Strong experimental design and rigorous and appropriate data collection, processing, and analysis are important. Some studies published in top journals include poor design choices, and it is your responsibility to learn as much as you can about a technique, so you don’t repeat the authors’ mistakes.

Participation:
Participation will be determined, at the sole discretion of the course director, based on your contributions to class lectures and discussions. You should come to class prepared to ask relevant questions about the readings, and it is expected that you will have read, made notes about, and highlighted confusing aspects of the readings in advance of each class. You should ask questions and contribute your knowledge about techniques, during lectures. This course will succeed or fail based on your interactions during the course.

Missed Deadlines:
If you think you are going to miss a deadline, please notify the course director, so alternate arrangements can be made.

Cheating:
Don’t cheat! Cheating and plagiarism not only impair your learning, but also are penalized by the university. If you cheat, you may receive a failing grade for the assignment or the course, or other actions may be taken against you. For university policy on cheating, see:
http://www.arts.yorku.ca/faculty_and_staff/policies_and_procedures_for_faculty/academic_honesty_students.php

General Information:
Important information for students regarding the Ethics Review process, Access/Disability, Academic Honesty/Integrity, Student Conduct, and Religious Observance Days is available on the CCAS webpage (see Reports, Initiatives, Documents):
http://www.yorku.ca/secretariat/senate_cte_main_pages/ccas.htm
Weekly Topics:

Day 1 – Sep 16: ERP lecture
Day 2 – Sep 23: ERP discussion
Day 3 – Sep 30: SEM lecture
Day 4 – Oct 7: SEM discussion
Day 5 – Oct 14: Eye movements discussion
Day 6 – Oct 21: Eye movements discussion
Day 7 – Oct 28: Outlier detection discussion
Day 8 – Nov 4: Outlier detection discussion
Day 9 – Nov 11: Mathematical modeling discussion
Day 10 – Nov 18: Mathematical modeling discussion
Day 11 – Nov 25: Computational modeling discussion
Day 12 – Dec 2: Computational modeling discussion

Methodology paper due dates:
Sep 30: Specific topic and methodology to be used
Oct 14: Outline of paper
Nov 4: Draft of paper
Nov 11: Feedback on paper drafts
Dec 2: Final paper
Weekly Readings:

Day 1: ERP lecture

Day 2: ERP discussion

Day 3: SEM lecture
Slides: Courtesy John Fox, http://socserv.mcmaster.ca/jfox/Courses/soc761/index.html

Day 4: SEM discussion

Day 5: Eye movements discussion

Day 6: Eye movements discussion

Day 7: Outlier detection discussion

Day 8: Outlier detection discussion

Day 9: Mathematical modeling discussion

Day 10: Mathematical modeling discussion

Day 11: Computational modeling discussion

Day 12: Computational modeling discussion