COGNITION AND NEUROSCIENCE 30812 (2019 F)

An introduction to the contribution of neuroscience to cognitive science
[0.5 credit]
INSTRUCTOR: KATHLEEN VAN BENTHEM

Class: Wednesdays from 8:35 to 11:20 am

Room: University Centre 374

Instructor: Kathleen Van Benthem, Ph.D.

Office: Visualization and Simulation (VSIM) Room 2212

Email: kathy.vanbenthem@carleton.ca (best way to reach me)

Office Hours: VSIM 2212 Thursdays 10:15am – 11:15am, by appointment only

Important Dates for Fall Term 2019-20:

Carleton students will have a **week-long break from October 21 to 25**. No class will take place during this time. Students will not be required to be on campus or submit coursework from October 19 to 27.

Required Text:

Principles of Cognitive Neuroscience by Purves et al. 2nd Edition 2013

Available from the Campus Bookstore, Amazon.ca and one copy is on reserve at the library. Note that the Campus Bookstore will apparently price match advertised prices from Amazon.ca or Indigo.

Selected Readings (links available on CuLearn or indicated in the syllabus)

General Overview:

The course content will familiarize students with key concepts in neuroscience as they pertain to the cognitive functions of interest in cognitive science. Students will be introduced to fMRI, EEG, MEG, fNIRS, and PET methodologies for Cognitive Neuroscience and the statistical methods used to describe findings from each imaging modality. Emphasis will be made on the practical implications of findings from the

domain of neuroscience on aspects of cognition relevant to each student. *Opportunity will be made for hands-on data collection and analysis using a dense-array or wireless 14-Channel EEG system.*

Evaluation:

Term work will consist of regular quizzes, one presentation, and one final group project.

Weighting of Final Grade:

- Quizzes 30%
- Midterm Presentation 20%
- EEG Group Project Presentation 50%

Test Deferral Policy:

If, for extraordinary reasons, you miss a quiz, you must notify me as soon as possible after the date in which it occurs. A deferred test will be permitted under only two conditions: illness or bereavement. Documentation is required for either case.

If no documentation is provided, you will receive a grade of zero for that test.

This policy will be strictly enforced.

Statement Regarding Plagiarism:

This is a very serious offence and plagiarism will not be taken lightly. If you are at all unsure as to whether you should cite something, cite it. If you use any ideas that are not your own, make sure to provide a clear reference to the source of those ideas (see APA manual for style guidelines). If you use words that are not your own (and it's not enough to just move a couple of words or phrases around) then make sure to use quotation marks to indicate which phrases/sentences are someone else's and provide a clear reference (again, use APA style). Ask me if you are unsure about how to cite your work properly.

The Senate of the University has labeled plagiarism an instructional offence. For the University's purposes to plagiarize is to "use and pass off as one's own idea or product work of another without expressly giving credit to another". Being caught plagiarizing can result in one being expelled, suspended from all studies at the University, suspended from full-time studies, awarded a reprimand, refused permission to continue or to register in a specific degree program but subject to having met all academic requirements shall be permitted to register and continue in some other

program, placed on Academic Warning, or awarded an F or Abs in a course or examination. For specific examples of plagiarism and tips on how to avoid it visit the Academic Integrity section of the Learning Commons at http://www.carleton.ca/wts/docs/writingresources.html#academicintegrity

Resources:

There are a number of resources available to you through Carleton University. Here are a few you may find useful:

1) For health and counselling issues you can visit the Health and Counselling Services; 2600 CTT Centre;

613-520-6674; www.carleton.ca/health

2) Student Academic Success Centre (SASC); 302 Tory; 613-520-7850; www.carleton.ca/sasc assists students with academic planning, understanding academic rules & regulations, finding a tutor, choosing or changing a major, polishing study skills, and referrals to other services.

3) Academic Writing Centre and Writing Tutorial Service (4th Floor, Library, 613-520-6632; www.carleton.ca/wts can help you learn to write better papers. Tutors are graduate students in many different departments, with plenty of experience writing. They are trained to assist you at any stage in the writing process. To make an appointment, simply call 520-6632, or come in person between 9:00 am and 4:30 pm Monday through Friday.

4) The Learning Commons (4th Floor, Library, 613-520-2600, ext.1125; See also Main Floor desk) is a one-stop study-shop that combines research, IT and learning support services under one roof to enhance the student experience.

Academic Accommodations:

The Office of the Vice-President (Students and Enrolment) offers a full package of tools and resources, such as Supporting Students in Distress and the Student Referral Guide, to assist you in helping students achieve their academic, personal and professional potential at carleton.ca/studentsupport.

Carleton is committed to providing access to the educational experience in order to promote academic accessibility for all individuals. Please review the processes for academic accommodation requests and ensure this information is included in all course outlines/syllabi for courses you are teaching this academic year.

Teaching and Learning Services

Teaching and Learning Services (TLS) can assist you in all facets of teaching and learning, from providing teaching skills and strategies, to helping with blended and online courses, to offering media production services, learning space design, award and grant application support, and more. TLS also engages undergraduate students as partners in teaching innovation and research through Carleton's Discovery Centre. Whether you have a simple question about technology or need in-depth support on pedagogical issues, the three units that make up TLS – Carleton University OnLine (CUOL), the Educational Development Centre (EDC), and Instructional Media Services (IMS) – are here to support you. Email tls@carleton.ca to set up a consultation.

You may need special arrangements to meet your academic obligations during the term because of disability, pregnancy or religious obligations. Please review the course outline promptly and write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

For Students with Disabilities:

Contact Paul Menton Centre (613-520-6608) to obtain letters of accommodations.

For Religious Observance:

To be worked out on individual basis with instructor. Consult Equity Services Website or an Equity Advisor (613-520-5622) for Policy and list of Holy Days (www.carleton.ca/equity).

For Pregnancy:

Contact Equity Services (ext. 613-520-5622) to obtain letters of accommodation

Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities

(LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD) and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-5206608, every term to ensure that your Instructor receives your Letter of Accommodation, no later than two weeks before the

first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by early November for the Fall term.

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at http://carleton.ca/equity/accommodation.

COURSE SCHEDULE:

Note: Dates for topics are approximate and may be changed. Weekly readings will be assigned in class for the following class. All chapter readings can be found in the Purves et al. text. Links to all other readings will be given in class and can be found on CuLearn.

Week	Topic	Resources
Getting to Know the Brain	Some classes will begin with a short quiz.	Chapters refer to your text Purves et al. (2013)
1. September 4	1. Why Neuroscience? 2. Structural and functional neuroanatomy	Chapter 1 and Appendix "Constraints" article by Ochsner and Kosslyn Preliminary online "quiz" not marked.
2. September 11	Quiz 1 Memory	Chapter 8 + Links in CuLearn "Prosopagnosia" Article
3. September 18	Quiz 2 1. Language 2. Developmental Issues in Cognitive Neuroscience	Chapter 12 CuLearn readings on Theories of aging: Who is HAROLD and what is PASA?
4. September 25	Quiz 3 Current Theories re: stimulus to meaningful information (visual and auditory systems)	Chapters 3 and 4 CuLearn Readings by Steven Luck. Designing EEG Studies
Contribution of Neuroscience to Cognitive Science Presentations	The next two weeks will consist of your individual presentations of how neuroscience methods could inform your own graduate research	Rubric and Example: Links in CuLearn
5. October 2	Brain Imaging Methods I 1. EEG and ERP/Spectral Analysis 2. PET	Textbook PubMed Google Scholar

	3. fNIRS	Library Database
6. October 9	Brain Imaging Methods II 1. MEG 2. fMRI 3. EEG and ERP/Spectral Analysis	Textbook PubMed Google Scholar Library Database
7 . October 16	Guest Lecture: Linguistics and Cognitive Neuroscience	TBD
8. October 23	Fall Reading Week No Class	
Data Collection and Analysis	The first hour will be spent in the class and the last two hours in groups preparing for the experiment, in the lab collecting data, or analyzing the EEG data.	See readings in CuLearn
9. October 30	Research Group Planning Class	CuLearn
10. November 6	8:35 to 9:30- Designing Your Study 9:45 to 11:25- LAB	CuLearn
11. November 13	8:35 to 9:30- Collecting Data 9:45 to 11:25- LAB	CuLearn
12. November 20	8:35 to 9:30- Analyzing Data 9:45 to 11:25- LAB	CuLearn
13. November 27	8:35 to 9:30-Reporting Findings 9:45 to 11:25- LAB	CuLearn
Cognition and Neuroscience Research	**Group Presentations**	
14. December 4	All Groups. Meet in University Centre 374	