

Department of Biology Course Outline

BIOL 4380 3.0M Systems Neuroscience Winter 2016

Course Description

This course investigates the neural basis of visual and auditory perception, echolocation, smell, short- and long-term memory, and motor control. Emphasis is on understanding how neural interactions analyze sensory information and control complex behaviour. Three lecture hours. One term. Three credits.

Prerequisites

SC/BIOL 3060 4.00.

Course Instructors and Contact Information

Dr. Thilo Womelsdorf
Lumbers Building
thiwom@yorku.ca

Office Hours: arrange by e-mail

Schedule

Lecture

Thursdays 7:00 – 10:00 pm
[Stedman Lecture Halls]

Evaluation

The final grade for the course will be based on the following items weighted as indicated:

Midterm Examination (in class, see course outline)	45%
Final Examination (Winter Exam Session):	55%

The midterm exam will consist of ~60 questions. The final exam will consist of ~120 questions. About 70% of questions will be multiple choice questions and the remaining questions will be made up of short answer questions, including labelling of figures. Students will have 2h (midterm) and 3h (final) to answer each question. Each exam question will be designed to have single correct answers. Questions will be discussed and explained in the classroom for all students after the exam to intensify and deepen the learning objectives of this course.

Important Dates

Important dates: [for date updates see: <http://www.registrar.yorku.ca/enrol/dates/fw15>]

Last date to enrol without permission of course instructor: 19th Jan. 2016

Last date to enrol with permission of course instructor: 31st Jan 2016

Last date to drop courses without receiving a grade: 7th March 2016

Last Date to Announce Components of Final Grades: 19th January 2016

Resources

Course Web Site: <https://moodle.yorku.ca/>

Suggested Texts:

- 1) Purves, D, Augustine, G.J., Fitzpatrick, D., Hall, W.C., LaMantia, A-S, McNamara, J.O. & White, L.E. **Neuroscience** (5th edition) Sunderland, MA: Sinauer Associates Inc.
- 2) Glimcher PW, Fehr E, Rangel A, Camerer C, Poldrack RA (2009) **Neuroeconomics: Decision Making and the Brain**. Academic Press.
- 3) MS Gazzaniga (2009) **The Cognitive Neurosciences**, 4th Edition, MIT Press.

These textbooks will be supplemented with more advanced material via the lecture where appropriate. Please see the Course Outline for lecture specific suggested reading ! An up-to date list of recent articles that underlies some of the material in the lectures is also hosted at:
<http://attentionlab.ca/doku.php?id=courses>

Course Content

Tentative Course Schedule – Please consult the up-to-date schedule on the course website.

- 1) 7th of January, 7-10pm
Introduction to Systems Neuroscience: From Cells to the Brain.
- 2) 14th of January, 7-10pm
Microcircuits and Behavior: Measuring and manipulating small circuits.
- 3) 21th of January, 7-10pm
Large-Scale Brain Networks and Behavior: Organizational principles of the Brain
- 4) 28th of January, 7-10pm
Brain Organization of Visual Information Processing I: From Sensation to Perception.
- 5) 4th of February, 7-10pm
Brain Organization of Visual Information Processing II: From Perception to Attention.
- 6) 11th of February, 7-10pm
Attentional Brain Networks, Working Memory, and the Neuromodulation of Thought.
- - - - - 15-21th of February, Reading Week / Co-Curricular Week - - - - -
- - - - - 25th of February, **Midterm Exam** (in-class) 7-8.30pm - - - - -
 - The midterm exam is a 2 hour exam (45% of the grade). It covers material from the first six classes
- 7) 3rd of March, 7-10pm
Brain networks of Emotion and Motivation, and the Neuromodulation of Mood.
- 8) 10th of March, 7-10pm
Principles of Learning and Memory in the Brain.
- 9) 17th of March, 7-10pm
Memory Circuits underlying episodic memory.
- 10) 24th of March, 7-10pm
Decision Making: Multiple Networks underlying Choice Behavior
- 11) 31th of March, 7-10pm
The Science of Neuroeconomics and the Brain Organization of Social Cognition
- - - - - 6-20th of April, **Final Exam** Period - - - - -
 - The final exam is a 3hour exam (55% of the grade). It covers all material of the course

Other Information

For the Course Web Site on Moodle, please note that the BIO4380 teaching staff does not have any control over the server. If you have any problems associated with the Moodle server you must contact helpdesk directly: helpdesk@yorku.ca.

Course Policies

Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.)

(For a full description of York grading system see the York University Undergraduate Calendar - http://calendars.registrar.yorku.ca/pdfs/ug2004cal/calug04_5_acadinfo.pdf)

Note: Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles. If an adjustment needs to be made, this will be done at the end of term.

Students may take a limited number of courses for degree credit on an ungraded (pass/fail) basis. For full information on this option see http://www.registrar.yorku.ca/pdf/passfail_option.pdf

Posting of Grades: Grades for tests and assignments will be posted on the course website as soon as they are available. Please do not ask when they will be available as the answer will inevitably be “as soon as possible”.

Missed Tests

Midterm: The only valid reason to miss the midterm exam is for medical reasons. There will be no make-up exam for the midterm.

Attending Physicians form (available at http://www.registrar.yorku.ca/pdf/petitions/attending_physician_statement.pdf) should be submitted to the course director within one week.

Final: For a missed final, you must provide a completed Attending Physician's form (available at http://www.registrar.yorku.ca/pdf/petitions/attending_physician_statement.pdf). This is the ONLY form of medical documentation, which is acceptable.

Tests in Alternative Exams:

Students with an up-to-date letter of accommodation from the Counselling and Development Centre, which allows them to sit exams as part of the Registrar's Office Alternative Exams scheme, are responsible for scheduling their own exams (<http://www.yorku.ca/altexams/>). To maintain the integrity of the exam, any sitting in alternative exams must be scheduled for the same day as the remainder of the class. Please note that the alternative exams facility now requires *15 business days notice*. If a student fails to make a booking in sufficient time, they will have the option of sitting the exam under the same conditions as the other students in the class or receiving an F for the exam. An additional version of the examination will not be set to accommodate a tardy student. It is recommended that every student books the date of the mid-term immediately.

Class Attendance: It is your responsibility to attend class. You will be tested on material presented in class, which may not appear in the suggested reading literature. I will not respond to requests asking what a student has missed by not attending class. “I did not know” is not a valid excuse when the information has been announced in class.

Course Notes and Overheads: I will upload notes etc. to the course website before the class. I will also post Question Sheets about the course materials that are supposed to guide and help your learning.

E-mail: It is recommended that all e-mails should be sent from your YorkU account. Please put **BIO4380** in the subject header of any e-mail. If the question cannot be answered in twenty words or less, it is more appropriate that you ask in person, either at office hour or after class. E-mail will not be answered at weekends, but will be dealt with as soon as possible during the week. Please sign your emails - *I will not respond to e-mails that are unsigned.*

IMPORTANT COURSE INFORMATION FOR STUDENTS

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Curriculum & Academic Standards webpage (see Reports, Initiatives, Documents) - http://www.yorku.ca/secretariat/senate_cte_main_pages/ccas.htm

- York's Academic Honesty Policy and Procedures/Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

Academic Honesty: I endorse the Senate's policy on Academic Honesty and will enforce it firmly on this course. Cheating is unacceptable on this course and any student who participates in this activity can expect to be referred to the appropriate disciplinary authority for their first offence. If you are unclear what does and does not constitute cheating please refer to the Academic Integrity web site (http://www.yorku.ca/tutorial/academic_integrity/) and read the section 'For Students'. If you have not completed the Academic Integrity Tutorial, which is hosted there, then I would urge you to do so. I am happy to answer specific questions about what does and does not constitute cheating when it is accompanied with a copy of the proof of completion of the tutorial.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students

must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>