

Department of Biology Course Outline

SC/BIO4370 3.0 Neurobiology
Fall, 2017

Course Description

An analysis of recent advances in neurobiology, particularly information processing and storage in nervous systems and the biochemical basis of learning, memory and behaviour. The neurobiology of addiction, diseases of the nervous system and regeneration are also discussed.
Three lecture hours. One term. Three credits.

Prerequisites

Prerequisites: SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 3060 4.00.
Course Credit Exclusion: AS/HH/SC/KINE 4512 3.00

Course Instructors and Contact Information

Instructor: Heather Jordan PhD
Stong College 322 HJordan@yorku.ca
165 Campus Walk
Course Office hours: Monday, 10-11 am

Schedule

Mondays/Wednesdays 8:00 – 9:30 am (CB129)

Evaluation

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

Class test I (1 hr):	11 th Oct	20%
Class test II (1 hr):	13 th Nov	20%
Final Examination (2.5 hrs):	Final Exam Period	60%

*Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

The class tests will be held during the normal lecture period. Each exam will cover approximately 4 weeks of material and will not be cumulative. The Final Exam will (a) cover the material from the

remaining third of the course (1 hr. 20% of final grade) and (b) a comprehensive section which covers course material from the entire course (1.5 hrs 40% of the final grade).

All exams will consist of approximately 60% multiple-choice questions and 40% short answer/labelling questions. There will be no make-up exams for missed class tests. The proportion of the final grade accounted for by the missed class test will be carried over to the comprehensive section of the final exam. It is not recommended that students miss class tests so that the final exam is worth most or all of their final grade.

Important Dates

Dates of Tests/Exams will be announced in class and using the Moodle course website.

Other important dates are accessible through web-based resources provided by York University for the student community. It is the responsibility of the student to know them. The sessional dates can be found at: <http://registrar.yorku.ca/enrol/dates/fw17>

For additional important dates such as holidays, drop date, etc. refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

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Resources

Recommended Text:

Purves, D, Augustine, G.J., Fitzpatrick, D., Hall, W.C., LaMantia, A-S, & White, L.E. *Neuroscience*. Sunderland, MA: Sinauer Associates Inc.

Note: 5th edition is recommended but may be hard to obtain. Fourth edition will suffice.

Bear, M. F., B. W. Connors, & M. A. Paradiso (2007). *Neuroscience: Exploring the Brain* (3rd ed.). Philadelphia: Lippincott. ISBN 0781760038.

This textbook is aimed at lower-level students, who do not necessarily have the basic background that is expected of 4th year undergraduates. This means that sections of the early chapters cover material which you should already be familiar with and will not be covered in class.

Liqun Luo, (2015) *Principles of Neurobiology* Taylor & Francis Ltd. ISBN-13: 978-0815344940

For students interested in additional information, this is a very clear, comprehensive textbook but with more detail than required for this course

Learning Outcomes

Upon successful completion of SC/BIOL 4370 3.0, students should be able to:

- Describe the structural and cellular components of the nervous system
- Describe fundamental processes that generate, shape and maintain nervous systems
- Describe cellular signalling and neuronal circuits
- Explain fundamental processes in signal transduction (e.g. Membranes and Membrane Potentials, The Action Potential, Voltage-dependent Membrane Permeability)
- Explain the functions of Ion Channels, Electrical and Chemical Synapses
- Explain the functions of Signal Transduction Pathways
- Explain the major concepts of Sensory Neuroscience in the areas of Visual and Auditory Processing
- Explain complex brain functions, including the role of Association Cortices and Learning and Memory formation from Cells to Systems
- Describe the basic principles underlying the evolution of the Nervous System.
- Describe the processes involved in a Neurodevelopmental and a Neurodegenerative disease.
- Use the process of scientific inquiry to make effective decisions/arguments about real-world topics related to the nervous system
- Compare state of the art technologies to investigate the Nervous System in Health and Disease

Course Content

The tentative course schedule will be posted separately at the Moodle Course website.

Experiential Education and E-Learning

E-Learning components are: online MCQs and supplemental videos posted on the course Moodle website.

It is suggested that students make use of the resources (summaries, flashcards etc.) on the textbook publisher's website, which does not require an access code (sites.sinauer.com/neuroscience5e)

Other Information

Course Policies

Missed Midterm and Final: You MUST email the course instructor within TWO days (48 hours) of missing a test.

Valid and appropriately detailed documentation supporting the events (typically medical or emergency related) preventing your attendance must be submitted to the biology undergraduate office SEVEN (7) days of the missed test. Documentation should cover the date of the missed test. Failure to do so will result in an automatic zero for the course component.

If the documentation supports your absence from a class test, you will be allowed to carry that portion of your final grade over to the comprehensive section of the Final Exam.

If documentation supports your absence from the Final Exam, you will be allowed to sit a make-up exam at the end of the fall exam period.

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/>).

Please note that the alternative exams facility now requires 15 business days notice. If a student fails to make a booking in sufficient time to sit the exam on the same day as the rest of the class, they will have the option of sitting the exam under the same conditions as the other students in the class or carrying the course grade component over to the comprehensive section of the final exam.

Recording Lectures:

Photographs or video recordings of any portion of the lectures (including slides) are PROHIBITED. Images and material presented are subject to CANADIAN COPYRIGHT LAW. They may not be distributed or sold to anyone,

Audio recordings are permitted provided they are used ONLY as a personal study aid, and are NOT sold, passed on to others or posted online. Remember the lectures are the intellectual property of the professor and cannot be distributed without permission.

Forum Code of Conduct:

An online Moodle forum will be made available to discuss course concepts, organize study groups, and ask questions relating to Biology. The discussion on the forums has typically been polite and respectful, and we hope this will continue.

Posting of Grades: Grades for tests 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".

To Save Embarrassment: In order to be fair and consistent to the entire class, individual grades are not negotiable.

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-and-or-harassing-behaviour-in-academic-situations-senate-policy/>