Course number: ACB 4451F section 001  
Course title: Integrative Neuroscience

Course Director: Dr. Shawn Whitehead  
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Email: shawn.whitehead@schulich.uwo.ca

Prerequisite: Neuro 2000, Physiol. 3120, or 3140

Course description:

This course examines brain function underlying specific fundamental behavioural tasks. Topics include learning and memory, reward and addiction, neurodevelopment and regeneration, motor systems, the neuroendocrine system, and neurodegenerative diseases. The course emphasizes the integrative understanding of the connection between molecular/cellular processes and behaviour. Apart from the neurobiological content the course will encourage active participation. Students will be exposed to labs, design and protocol experiments, and presenting on neurobiological topics.

The first part of the course will briefly repeat some basics of neuroscience and will focus on consolidation of this knowledge by applying the concepts through the labs. The lectures will be interactive and have the goal to bring all students to a similar high level of understanding the cellular principles underlying neuronal function. This first part will also focus on specific skills, such as designing and documenting an experiment, writing a protocol, using a brain atlas in order to identify brain structures, searching for literature in online databases, working in a team, etc.

The second part of the course will focus on different systems, and the brain structures and mechanisms involved in these systems. Occasionally, specialists that do research here at UWO within the specific topics will give a guest lecture. This will also provide a glimpse of the neuroscience research that is going on here at Western. The lab hours during the second part of the course will be used for student’s presentations on a topic introduced in class. After an introduction on how to prepare and present, each student will be presenting on a neuroscientific topic. Presentations will be in groups of two or three students. Marking will be based on lab exercises and assignments, the presentation, the final exam and the active participation. Marking will be done by the course coordinator, the teaching assistants, and peers.

In some weeks it will be necessary to read an article, gather material or prepare a written assignment additionally to the course hours. Furthermore, each student needs to prepare a talk during the second part of the course. Participation in all lecture and lab hours is mandatory. Additional reading about the course topics in a textbook is strongly encouraged, but it is not required for the final exam. The final exam will be short answer/essay type questions, no multiple choice.
**Time and Location:** Tuesdays: 9:30-11:30 – P&AB 36
    Thursdays: 10:30-12:30 – WSC 240 (or MSB 117 in first 2 weeks)

**Participation is mandatory for all lectures and labs**

**Books and Notes:**

Course materials and textbook suggestions will be discussed during the first lecture. Lab materials and manuals will be provided before labs or made available through Owl.

**Absence from course commitments**

It is current policy that students who are unable to write a test or examination or other form of course evaluation are required to obtain a medical certificate that is taken to the Academic Counseling Office, WSC140 (for Science and Basic Medical Science students) or to your appropriate Home Faculty Counseling Office. In the case of an unexpected absence on compassionate grounds, documentation is also requested. **All documentation must be submitted by the student directly to the Academic Counseling office and not to the instructor.** An academic counselor in that office will review and either approve or deny the accommodation request. It will be the Academic Counseling office that will determine if accommodation is warranted. This policy applies to all forms of assessment, including evaluations that are less than 10%.

**Absence for medical illness:**
Students must familiarize themselves with the Policy on Accommodation for Medical Illness: [https://studentservices.uwo.ca/secure/index.cfm](https://studentservices.uwo.ca/secure/index.cfm)

**Statement from the Dean’s Office**
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: [http://www.uwo.ca/univsec/handbook/appeals/medical.pdf](http://www.uwo.ca/univsec/handbook/appeals/medical.pdf)
A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.
The form can be found at: [https://studentservices.uwo.ca/secure/medical_document.pdf](https://studentservices.uwo.ca/secure/medical_document.pdf)
The Policy on Accommodation for Medical Illness is also available on the BMSUE secure site: [www.uwo.ca/bmsc](http://www.uwo.ca/bmsc)

**Absence for non-medical reasons:**
If you are unable to meet a course requirement due to non-medical reasons documentation must be submitted by the student directly to the appropriate Faculty Dean’s Office and **not** to the instructor. It will subsequently be the Dean’s Office that will determine if accommodation is warranted.
Special Examinations
A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents.
A Special Examination must be written at the University or an Affiliated University College no later than 30 days after the end of the examination period involved. To accommodate unusual circumstances, a date later than this may be arranged at the time permission is first given by the Dean of the Faculty. The Dean will consult with the instructor and Department Chair and, if a later date is arranged, will communicate this to Registrarial Services. If a student fails to write a scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered.

Course Syllabus
The first part of the course will repeat some basics of neuroscience and will focus on consolidation of this knowledge by applying it during the labs. The lectures will be interactive and have the goal to bring all students to a similar level. This first part will also focus on specific skills, such as designing and documenting an experiment, writing a protocol, using a brain atlas in order to identify brain structures, searching for literature in online databases, working in a team, etc. The second part of the course will focus on different systems and the brain structures and mechanisms involved in these systems. It also provides a glimpse of the neuroscience research that is going on here at Western.

Evaluation
Histology lab  10% assignment
Neurophysiology lab  10% assignment
Experiment design  10% assignment
Experiment protocol  10% assignment
Presentation  20% TA/peer evaluation
Active participation  10% TA evaluation
Final exam  30% - Cumulative

Additional Information/Statements
Statement on Use of Electronic Devices
No electronic devices are to be used during the final exams.

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 Web site: http://www.uwo.ca/univsec/handbook/appeals/scholoff.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).

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Support Services:
Registrar Services (http://www.registrar.uwo.ca),
Student Development Services: http://westernusc.ca/services/
Students that are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.
Academic Counselling (Science and Basic Medical Sciences): http://www.uwo.ca/sci/counselling/index.html
Student Health Services: http://www.shs.uwo.ca/
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<thead>
<tr>
<th>Date Range</th>
<th>Topic</th>
<th>Instructor</th>
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| September 6, 2018 | Introduction, Rules, Course overview  
|              | *How to give a presentation – Assignment of topics*                | Whitehead          |
| September 11, 2018 | Brain evolution  
| September 13, 2018 | Structure of the Nervous System  
|                  | *Lab: Neuroanatomy of the human CNS (MSB 117)*                  | Whitehead          |
| September 18, 2018 | Neurons & Glia  
| September 20, 2018 | Structure & Function of neurons  
|                  | *Lab: Histology – Lab assignment (MSB 117)*                   | Whitehead          |
| September 25, 2018 | Neurotransmitter systems  
| September 27, 2018 | Synaptic transmission  
|                  | *How to design and protocol and experiment - Experiment design assignment* | Whitehead          |
| October 2, 2018 | Passive properties of the neuronal membrane  
| October 4, 2018 | Active propagation of signals  
|                  | *Computer Lab: Neurophysiology – Lab assignment*               | Schmid             |
| October 8-12, 2018 | Thanksgiving  
|                  | *Reading week*                                               |                    |
| October 16, 2018 | Intro: learning and Memory, Synaptic plasticity  
| October 18, 2018 | Research into Cognitive Function  
|                  | *Learning experiment: Protocol assignment*                    | Schmid             |
| October 23, 2018 | Mitchell – Background A  
| October 25, 2018 | Mitchell – Research A  
|                  | Student presentations – Mitchell A                            | Mitchell           |
| October 30, 2018 | Mitchell – Background B  
| November 1, 2018 | Mitchell – Research B  
|                  | Student presentations - Mitchell B                            | Mitchell           |
| November 6, 2018 | Mitchell – Background C  
| November 8, 2018 | Mitchell – Research C  
|                  | Student presentations – Mitchell C                            | Mitchell           |
| November 13, 2018 | Whitehead – Background A  
| November 15, 2018 | Whitehead – Research A  
|                  | Student presentations -Whitehead A                           | Whitehead          |
| November 20, 2018 | Whitehead – Background B  
| November 22, 2018 | Whitehead – Research B  
|                  | Student Presentations – Whitehead B                          | Whitehead          |
| November 27, 2018 | Whitehead – Background C  
| November 29, 2018 | Whitehead – Research C  
|                  | Student presentations – Whitehead C                          | Whitehead          |
| December 4, 2018 | Auditory System  
| December 6, 2018 | Review/OFF                                                   | Allman             |