Course number: ACB 4451F section 650
Course title: Integrative Neuroscience

Course Director: Dr. Susanne Schmid
Office: MSB 470, Medical Sciences Building
Phone: (519) 661-2111, ext. 82668
Email: Susanne.schmid@schulich.uwo.ca
Office hours: Fridays 9-10 am

Prerequisite: Neuro 2000, Physiol. 3120, or 3140 (can be waived by course coordinator)

Course description:
This course examines brain functions 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. Students will be exposed to online labs, design and protocol experiments, read original research articles and write a paper critique.

The first part of the course will briefly 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 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 provide a glimpse of the neuroscience research that is going on here at Western.

Marking will be based on lab exercises and written assignments, and the final exam. In some weeks it will be necessary to read an article, gather material or prepare a written assignment additionally to the course hours. 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: Mon and Wed, 10.00 -11.00
Participation in live classrooms is not mandatory, all lectures will be archived and can be revisited any time. Please be aware that it may NOT be possible to attend live lectures of ACB 4451F section 001 due to limited space in the classroom.
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 Sakai.

4. 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%.

A. 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)

B. 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.
C. 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.

5. Policy on Rounding and Bumping of Grades
Across the Basic Medical Sciences Undergraduate Education programs and within the department of Anatomy and Cell Biology we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course will be calculated to one decimal place and rounded up to the next whole integer, e.g. a 74.5 becomes a 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved and the mark assigned; requests for mark “bumping” will be denied.

6. 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 (tentative dates):

Anatomy lab Sept. 15  5%
Histology lab Sept. 23  10%
Neurophysiology lab Sept. 29  10%
Experiment design Oct. 16  10%
Experiment protocol Oct. 23  15%
Written paper critique Nov. 23  20%
Final exam TBA  30%

It is not mandatory to attend the live online classroom, but it is strongly recommended. Labs need to be accomplished in the date indicated above or as indicated when assignments are posted (some deadlines might get adjusted). Please adhere to the deadlines for submitting lab assignments. Late submission will result in a 0% mark, unless course coordinator has been notified and permitted late submission before the deadline has passed.

Some assignments can be accomplished as group work (online or by meeting group members). Group work means that the product is generated through the intense interaction of two or three students. It is not acceptable that one student only revises the product of another student or that different students contribute different parts that are just appended. In case of a group submission, it is important to indicate all names of group members and the way the group worked together, so that the product it is not identified as plagiarism. All group members should still submit the (potentially identical) assignment through the website, so that it is not marked as missed assignment. Each group member has to also independently submit a short description about each group member’s role in the group assignment.

In some weeks it will be necessary to read an article, gather material or prepare a written assignment additionally to the course hours. Additional reading about the course topics in a textbook is strongly encouraged, but it is not required for the final exam.

Course outline Fall 2017 online course

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>Fri, Sept. 08</td>
<td>Introduction, Rules, Course overview Technical issues</td>
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<td>Susanne Schmid</td>
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<tr>
<td>Mon, Sept. 11</td>
<td>Brain evolution</td>
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<td>SS</td>
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<tr>
<td>Wed, Sept. 13</td>
<td>Structure of the Nervous System</td>
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<td>SS</td>
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<tr>
<td>Fri, Sept. 15</td>
<td><em>Lab: Neuroanatomy of the human CNS</em> Quiz</td>
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<td>SS</td>
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<tr>
<td>Mon, Sept. 18</td>
<td>Neurons &amp; Glia</td>
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<td>SS</td>
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<tr>
<td>Wed, Sept. 20</td>
<td>Structure &amp; Function of neurons</td>
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<td>SS</td>
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<tr>
<td>Fri, Sept. 22</td>
<td><em>Lab: Histology – Lab assignment</em></td>
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<td>SS</td>
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<tr>
<td>Mon, Sept. 25</td>
<td>Passive properties of the neuronal membrane</td>
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<td>SS</td>
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<tr>
<td>Wed, Sept. 27</td>
<td>Active propagation of signals</td>
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<td>SS</td>
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<td>Fri, Sept. 29</td>
<td><em>Computer Lab: Neurophysiology – Lab assignment</em></td>
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<td>SS</td>
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<tr>
<td>Mon, Oct. 02</td>
<td>Neurotransmitter systems</td>
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<tr>
<td>Wed, Oct. 04</td>
<td>Synaptic transmission/Synaptic plasticity</td>
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<td>SS</td>
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<tr>
<td>Fri, Oct. 07</td>
<td>How to design and protocol an experiment - <em>Experiment design assignment</em></td>
<td></td>
<td>SS</td>
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Mon, Oct. 09
Wed, Oct. 11
Fri, Oct. 13

Thanksgiving
Reading weak

Mon, Oct. 16 unit 1
Wed, Oct. 198
Fri, Oct. 20

Intro: learning and Memory
Research into Cognitive Function

Learning experiment: Protocol assignment

SS
SS
SS, students

Mon, Oct. 23 unit 2
Wed, Oct. 25
Friday Oct 27

Intro: Reward and Addiction
Research on Addiction

Paper Critique posted

SS
SL

Mon, Oct. 30 unit 3
Wed, Nov. 01

Intro: Motor systems
Research on Parkinsons Disease

SS
VP

Mon, Nov. 06 unit 4
Wed, Nov. 08

Intro: Neuroendocrine system
Stress, Stress Disorders

SS
SL

Mon, Nov. 13
Wed, Nov. 15

SFN
SFN

Mon, Nov. 20 unit 5
Wed, Nov. 22

Intro: Cell death – Apoptosis versus Necrosis
Neuroinflammation in Stroke and AD

SS
SW

Mon, Nov. 27 unit 6
Wed, Nov. 29

Intro: Neurodevelopment and Regeneration of Neurons
Research in Spinal Cord Development & Regeneration

SS
AB

Mon, Dec. 04
Wed, Dec. 06

Research on neurodegenerative diseases (Prion diseases)
Research on hearing loss

MA
BA

AB: Arthur Brown; MP: Marco Prado; NR: Nagalingam Rajakumar; VP: Vania Prado; SW: Shawn Whitehead; SL: Steven Laviolette; BA: Brian Allman

7. Additional Information/Statements

**Statement on Use of Electronic Devices**
All students need to have a computer with internet access, and a headset (or microphone and speakers).

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](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:**

Registrarial 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/