Re the WESTERN UNIVERSITY
LONDON, CANADA

2017-2018

Neuroscience 2000, Section#001
Introduction to Neuroscience

1.0 CALENDAR DESCRIPTION

A comprehensive introduction to the neurosciences. Topics include molecular and cellular properties of neurons; neural plasticity; development of the brain and nervous system; sensory, motor and integrative systems; neural mechanisms of behaviour and cognition, including memory, language, and consciousness. Molecular and genetic techniques, electrophysiological recording, and brain imaging methods will be examined.
Antirequisites: None
Prerequisite: Psychology 1000 or the former Psychology 1200 with a minimum mark of 60%; either Biology 1001A or 1201A with a minimum mark of 60%; and either Biology 1002B or 1202B with a minimum mark of 60%.
3 lecture/discussion hours, 1.0 course

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2.0 COURSE INFORMATION

Faculty

Instructor:	Dr. Brian Corneil (Course Manager)
Office:	RRI 1250D
Phone Number:	519-663-5777 x24132
E-mail:	bcorneil@uwo.ca
Office Hours:	after class or by appointment

Instructor:	Dr. Julio Martinez-Trujillo
Office:	RRI 7239
Phone Number:	519-663-5777 x24383
E-mail:	Julio.martinez@robarts.ca
Office Hours:	after class or by appointment

Instructor:	Dr. Stephen G. Lomber
Office:	SSC 9232
Phone Number:	519-663-5777, x24110
E-mail:	steve.lomber@uwo.ca
Office Hours:	after class or by appointment

Instructor:	Dr. Jody Culham
Office:	NSC 207
Phone Number:	519-661-3979
E-mail:	jody.culham@gmail.com
Office Hours:	after class or by appointment
Teaching Assistant (Fall 2017):	Becca Kozak
Office:	RRI
E-mail:	rkozak3@uwo.ca
Office Hours:	after class or by appointment
Teaching Assistant (Winter 2018):	Stephen Gordon
Office:	SSC
E-mail:	sgordo27@uwo.ca
Office Hours:	after class or by appointment
Time and Location of Lectures:	Wednesday 9:30-11:20 AM MSB 384
Time and Location of Tutorial/labs:	Fridays *usually* 9:30-10:20 AM in MSB 384 "Backyard Brains" labs from 8:30-10:20 AM, variable locations (see schedule and tutorial/lab information below)

3.0 TEXTBOOKS

Required: Neuroscience: Exploring the Brain (either the 3rd or 4th Edition)
By Mark F. Bear, Barry W. Connors, and Michael A. Paradiso
Lippincott, Williams & Wilkins, 2007 (3rd Edition; may be available used at the Bookstore) or 2016 (4th Edition)

4.0 COURSE OBJECTIVES

The course is divided into three sections:

1) Foundations of the Nervous System
2) Functional Systems
3) The Brain and Behavior

The course begins with the study of nerve cells: their structure, the propagation of nerve impulses and transfer of information between nerve cells, the effects of drugs on this process, and the development of nerve cells in the brain and spinal cord. We also examine the overall structure of the nervous system and its development. We will then cover how the brain controls movement from a bottom-up perspective, beginning with the spinal cord and muscle contraction, moving through integrative control by the brainstem, cerebellum, and basal ganglia, and finishing with considerations of the cortical control of movement. We will then move onto functional sensory systems such as vision, hearing, touch, smell, balance, and taste. We will discuss how physical energy such as light is converted into neural signals, where these signals travel in the brain, and how they are processed. Finally, we will study eating &

drinking, language, attention, sleep, consciousness, mental illness, emotion, learning and memory. From this course, you should obtain a solid understanding of the basics of brain function and neuroscience.

Goals:

- Learn the structure and function of our nervous system.
- Learn how the brain controls movement
- Learn how our brain compresses and analyzes incoming information
- Learn the beauty and sophistication of our neurological systems

5.0 EVALUATION

Exams (80%): There will be four exams during the course. Each exam will be worth 20% of your final grade and will cover the material from the 6-7 lectures preceding the exam, as well as content covered in the respective labs and tutorials. There will not be a cumulative final exam. Material covered on the exams will be taken from the assigned readings and class lectures, as well as any additional material that may be provided. Exams will consist of 50 multiple choice questions.

Assignments (20%): Two assignments, worth 10% each, will be completed during the course. One, a written critique of neuroscience as portrayed in the movies, will be due in December. The second, a simulated "public service announcement" video, will be due in March. Details about the two assignments will be conveyed at the first tutorial meeting on September 8th, 2017.

Missed Exams: Missed exams may be made up only if you: **1)** have a valid excuse, **2)** notified Dr. Corneil **BEFORE** the exam, and **3)** provided appropriate documentation to an academic counselor in your home faculty (e.g., documentation that you sought medical assistance, a newspaper clipping of the obituary of your dead relative, photographs of you with the space aliens that conveniently abducted you the evening before the exam).

The Western University grading guidelines, are as follows (see http://www.uwo.ca/univsec/handbook/general/grades_undergrad.pdf):

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work that is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

6.0 EXAMINATION SCHEDULE

Exam 1	Fri, Nov 3rd, 2017 – 9:30 am, Location: EC 2168 A/B (note location)
Exam 2	TBD, During December Exam Period
Exam 3	Fri, March 2nd, 2017 – 9:30 am, Location: EC 2168 A/B (note location)
Exam 4	TBD, During April Exam Period

7.0 TUTORIALS AND LABS

Throughout the year, lecture content will be supplemented by tutorials and labs, which will be held on Fridays. Some of the tutorials and labs are intended to provide you with hands-on experiences in neuroscience, whereas others will feature guest speakers, and/or provide a variety of sources of information either about neuroscience opportunities and resources at Western.

More information about the tutorials and labs will be provided in the Introductory tutorial held on Friday Sept 8th, 9:30, MSB 384.

Tutorials: These will last just under **1 hour**, and when run, will always be held on Friday 9:30-10:20 in MSB 384 (the same classroom as the lectures).

Labs: Labs will feature hands-on experiences, and will last for just under **2 hours** on Fridays from 8:30-10:20. Please check the schedule below for the exact location of the labs.

Much of the equipment that we will be using for the labs comes from a company called **Backyard Brains**, which provides equipment to make neurophysiology accessible (www.backyardbrains.com). Funds for the Backyard Brains equipment that we will be using this year came from a generous grant obtained through the **Sciences Student Development Fund**.

8.0 LECTURE, READING AND TUTORIAL SCHEDULE

Fall Term

Date	Lecture	Lecture Topic	Lecturer	Chapter
Sept 8		*Tutorial: Introduction/Assignment Outline*		
Sept 13	1	Nervous System Overview	Corneil	1
Sept 15		*Lab: Brain Day MSB 120*		
Sept 20	2	Neurons and Glia	Martinez-Trujillo	2
Sept 22		*Lab: Backyard Brains MSB 120*		
Sept 27	3	The Neuronal Membrane at Rest	Martinez-Trujillo	3
Sept 29		*Lab: Backyard Brains MSB 120*		
Oct 4	4	The Action Potential	Martinez-Trujillo	4
Oct 6		*Tutorial: Guest Speaker MSB 384*		
Oct 11		No lecture – Fall Reading Week		
Oct 13		No Lab – Fall Reading Week		
Oct 18	5	Synaptic Transmission	Martinez-Trujillo	5
Oct 20		*Tutorial: Guest Speaker MSB 384*		
Oct 25	6	Neurotransmitters and Receptors	Martinez-Trujillo	6
Oct 27		*Tutorial: Exam Review MSB 384*		
Nov 1	7	Spinal Control of Movement	Corneil	13
Nov 3		**Exam 1**		
Nov 8	8	Central Control of Movement	Corneil	14
Nov 10		*Lab: Backyard Brains TMS/EMG/MEP. MSB 120*		
Nov 15	9	Modulation of Movement: Basal Ganglia & Cerebellum	Corneil	14
Nov 17		*Tutorial: Prism Goggles Demo MSB 384*		
Nov 22	10	Eye Movements	Corneil	
Nov 24		*Tutorial: Peer-Review Day MSB 384*		
Nov 29	11	Visceral System, ANS, and Hypothalamus	Corneil	15
Dec 1		*Tutorial: Getting involved in research (Guest) MSB 384*		
Dec 6	12	Motivated Behaviour and Executive Control	Corneil	16
Dec 8		*Tutorial. Exam Review MSB 384*		
TBD		**Exam 2** – During Exam Period		

Winter Term

Date	Lecture	Lecture	Lecturer	Chapter
Jan 10	13	Structure and Development of the Nervous System	Lomber	7,8
Jan 12		*Tutorial: Introductions and Assignment outline MSB 384*		
Jan 17	14	The Eye	Lomber	9
Jan 19		*Tutorial: The Eye/Ophthalmoscope MSB 384*		
Jan 24	15	The Visual System	Lomber	10
Jan 26		*Lab: Backyard Brains MSB 120*		
Jan 31	16	Auditory and Vestibular Systems	Lomber	11
Feb 2		*Lab: Backyard Brains MSB 120*		
Feb 7	17	The Somatosensory System	Lomber	12
Feb 9		*Lab: Backyard Brains MSB 120*		
Feb 14	18	Olfaction and Gustation	Lomber	8
Feb 16		*Tutorial: Exam Review MSB 384*		
Feb 21		*Reading Week – No Class*		
Feb 23		*Reading Week – No Tutorial*		
Feb 28	19	Sex and the Brain	Culham	17
Mar 2		**Exam 3**		
Mar 7	20	Brain Mechanisms of Emotion and Memory	Culham	18
Mar 9		*Tutorial: Presentations MSB 384*		
Mar 14	21	Brain Rhythms and Sleep	Culham	19
Mar 16		*Tutorial: Presentations MSB 384*		
Mar 21	22	Language	Culham	20
Mar 23		*Tutorial: Presentations MSB 384*		
Mar 28	23	Mental Illness	Culham	22
Mar 30		*No lab – Easter Friday*		
Apr 4	24	Wiring the Brain	Culham	23
Apr 6		*Exam Review*		
Apr 11	25	Attention and Consciousness		21
TBD		**Exam 4** – During Exam Period		

9.0 STATEMENT ON ACADEMIC OFFENCES

Students are responsible for understanding the nature and avoiding the occurrence of plagiarism and other scholastic offenses. Plagiarism and cheating are considered very serious offenses because they undermine the integrity of research and education. Actions constituting a scholastic offense are described at the following link: http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf

The following steps are taken to detect scholastic offenses. All multiple-choice tests and exams will be checked for similarities in the pattern of responses using reliable software, and records will be made of student seating locations in all tests and exams.

Possible penalties for a scholastic offense include failure of the assignment, failure of the course, suspension from the University, and expulsion from the University.

10.0 OTHER INFORMATION

OWL:
A copy of the syllabus and other important information will be posted on OWL. At least 48 hours prior to each lecture, an outline of the lecture will be posted and available for downloading and printing. These outlines will accumulate until the next exam, when they will be removed.

Attendance and Readings:
Your performance in this course will be greatly influenced by your attendance. Some material discussed in lecture is not covered in the textbook.

Cell Phones, etc.:
Cell phones, pagers, iPods, and other electronic devices, except laptops, have no place in class. Please do not bring them to class or turn them off. Any ringing cell phones will be answered by the lecturer.

Support Services:
Registrarial Services: http://www.registrar.uwo.ca
Academic Counseling (Science and Basic Medical Sciences):
http://www.uwo.ca/sci/counselling/index.html
USC Student Support Services: http://westernusc.ca/service
Student Development Centre: http://www.sdc.uwo.ca
Student Health Services: http://www.shs.uwo.ca/
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.

Undergraduate program in Neuroscience
For further information about the undergraduate program in Neuroscience, please see:
http://www.schulich.uwo.ca/bsc-neuroscience

No electronic devices, including cell phones, will be allowed during exams.