Introductory Neuroscience
BIOL 3063/ 3060L

Instructor: Brian Wilson (he/him)
Hear my name
Office: Biology Bldg. 106
Office hours: M, W &F 9:30-10:20am;
T 8:30-10:30
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Lecture: M, W & F, HSH 016, 08:30-09:20
Lab: HSH 059
WI01 – Monday, 1:00-3:50pm

Evaluation	Percentage	Date
End of module quizzes	(3 X 25%) = 75%	Q1 Feb 7; Q2 Mar 12; Q3 TBA
Paper assignments	(4 X 5%) = 20%	Due 2 weeks after being assigned
Weekly review questions	(10 X 0.5%) = 5%	Due every Monday

Part 1: Course Information

Course Description

The objective of this course is to provide students with an introduction to vertebrate nervous systems. Lecture topics will include the cell biology of neurons, electrical and biochemical signaling by neurons, organization and anatomy of nervous systems, sensation, perception, motor control, specialized senses (vision), learning, memory and CNS diseases. Lab sessions will compliment lectures and include computer simulations, web-based activities and case studies. The course is complimentary to Psych 3383.
Prerequisite(s): BIOL 2013 or PSYC 2133 or CHEM 2713 with **at least** a C- (60%)

Course Materials & Requirements

The recommended text for the course is:
Purves D et al. (eds). 2023. Neuroscience, Seventh Ed. Oxford University Press, New York ISBN: 9780197616246

Available as an e-rental from Redshelf or VitalSource. You will require a computer with reliable internet access, access to the course ACORN page and access to the Vaughn Memorial Library's Biology LibGuide

Course Structure

Lecture material will be presented in 50min lecture slots in person.
Lectures will take place **M, W, & F** in **HSH 016**, **08:30AM-09:20AM**
Labs will take place in person in HSH 059 on the following days:
Mon (WI01) 1:00-3:50pm
****Labs will begin the 2nd week of classes**

Student Learning Outcomes

- Understand the structure and function of neurons, synapses and pathways.
- Understand the structure and function of glial cells.
- Understand how spinal and cranial reflexes work.
- Understand the development and anatomical organization of the spinal cord and brain.
- Understand how we detect, localize and process sensory inputs.

- Understand how we initiate, direct and complete motor tasks with precision.
- Understand the bases for diseases of the nervous system and mechanism of action of several illicit drugs.

Part 2: Course Plan

Lecture:

Weeks 1 & 2	Introduction; history of neuroscience; techniques
	Cell types: Neurons, glia
	Neurodegenerative diseases
Weeks 2 - 5	Membranes, ion distribution, membrane potential
	Graded potentials and Action Potentials
	Synapses and neurotransmitters
	Receptors, signal transduction
	Illicit drugs
	Test 1 February 7 in class
Weeks 6 - 9	Development of CNS; Anatomy
	Somatosensory systems
	Special Sense: Vision
	Test 2 March 12 in class
Weeks 9 - 12	Somatic motor systems
	Basal Ganglia -Parkinson's Disease and Huntington's chorea
	Cerebellum -Cerebellar ataxia
	Visceral motor systems (ANS)
Week 13	Learning and Memory
	Test 3 scheduled by the Registrar

Course materials are available on ACORN.

The instructor reserves the right to amend the course plan with reasonable notice, and in consultation with the class.

Lab:

Week 1	No lab
Week 2	Neuron and glial cell histology
Week 3	Case 1 -- Excitable Cells
Week 4	Biorhythms and feedback
Week 5	Case 2 -- Drugs
Week 6	Brain, spinal cord anatomy
Week 7	No lab
Week 8	Case 3 -- Pain
Week 9	Reflexes: Cockroach NS
Week 10	Case 4 – EEG and levels of alertness
Week 11	Movement/Motor activity

Dates are tentative and depend on the rate that material is covered.

Following Case Study labs, students will be assigned a recent research article in an area of neuroscience that presents information parallel to topics discussed in lecture/lab and the case. Students are expected to read each article critically and complete a short writing assignment (2-3 type-written pages max) using the article. The assignment will be due two weeks following the lab. Each assignment is to be done in Microsoft Word and submitted via the link on the ACORN web page for the course. The format and details of these assignments will be introduced in the first lecture and lab. Each paper assignment will be worth 5% of the overall course grade (4 assignments = 20%).

Test 3 will be held during the final exam period scheduled by the Registrar. It will cover material on the somatic and visceral motor systems.

Part 3: Assessment and Grading

Points	Description
Tests (75%)	3 quizzes, 25% each
Case study assignments (20%)	4 short assignments worth 5% each
Review Qs (5%)	weekly review (0.5 point each)
100	**Total Points Possible**

You are required to pass the lab to pass the course. Case study assignments will be assigned after each case study. Each assignment is to be completed in Microsoft Word and submitted via the link on the ACORN web page for the course. The format and details of these assignments will be introduced in the first lab period.

Part 4: Course Policies

Work plan:

The course is organized into 3 modules (refer to the schedule) and the expectation is that students will review material consistently throughout each week. The course is content-rich and approaching your studies in a structured way will improve your chance at success.

Missed quizzes:

Quizzes will be written during lecture periods (see schedule). Missed quizzes will result in a grade of zero being assigned for that quiz. Students will NOT be allowed to write makeup quizzes. When documentation is provided to the Registrar's Office, which supports a medical excuse, the weighting of the missed exam/quiz will be applied to a subsequent exam/quiz. If students know that they will be missing an exam or quiz ie: for a job or admissions interview, arrangements can be made to write the exam or quiz before the scheduled time. Arrangements must be made at least one week PRIOR to the quiz date.

https://registrar.acadiau.ca/RecordsandOtherRequests.html

Late work:

Any assignments handed in after the due date will be accepted for up to 2 days following this date. The student will be penalized 10% of the grade per day late up to 20% (2nd day). If an assignment is not handed in after 2 days, it will be assigned a grade of zero.

Part 5: University Policies

University policies are available in the Acadia University Academic Calendar or through the Registrar's website: https://registrar.acadiau.ca/welcometotheregistrarsoffice.html

Equity, Diversity and Inclusion

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity. The policy against harassment and discrimination, and resources for students who believe they may have experienced, or witnessed, discrimination or harassment, are available here: https://www2.acadiau.ca/student-life/equity-judicial/equity.html

Last Drop Day

Last day to drop a course and receive a "W". Please check the Acadia University calendar dates, which are available here: https://registrar.acadiau.ca/AcademicCalendars.html

Inform Your Instructor of Accommodations

Acadia University is dedicated to improving access to campus life for all students with disabilities. While we attempt to ensure that all courses are accessible, we recognize that there are barriers that need to be addressed on an individual basis. Students who require accommodations to complete coursework or otherwise fully participate in class should contact Accessible Learning Services directly as soon as possible. https://www2.acadiau.ca/student-life/accessiblelearning.html

The Use of Animals in Teaching and Research

The use of animals in teaching and research at Acadia University is done in accordance with guidelines on the care and use of animals published by the Canadian Council on Animal Care (CCAC). For more information on the CCAC, please visit their website at http://www.ccac.ca

Commitment to Integrity

It is standard practice in Biology to check exams and assignments for cheating and plagiarism. Cheating in the class and/or lab, including plagiarism, will not be tolerated. Please read the appropriate sections of the current Acadia University Academic Calendar: https://registrar.acadiau.ca/AcademicCalendars.html

Information on copy-write and course content from Acadia University is available through the Vaughan Memorial Library: http://libguides.acadiau.ca/c.php?g=433650&p=5027078

Students may not use generative AI, such as Chat GPT, or paraphrasing software, such as QuillBot, to help them complete assignments. When an assignment seems like it has been completed with the aid of one of these programs, the procedure for investigating academic integrity infractions will be followed (pages 40-41 of Acadia's Academic Calendar at https://registrar.acadiau.ca/AcademicCalendars.html).

The spoken and written course content (including the syllabus, handouts, lectures, presentations, labs, assignments, quizzes, tests, and exams) are the intellectual property of the instructor and may only be copied for personal use. Sharing these materials or uploading them where they may be accessed by others is a violation of copyright. If you wish to make audio, video, or photographic recordings in class, you must first obtain the consent of the instructor and of any other persons (e.g., guest speakers, other students) who may be captured in such recordings. In the case of personal use by students with disabilities, the instructor's consent shall not be unreasonably withheld.

Acadia is a Scent-Free Campus

In consideration of the difficulties that exposure to scented products causes individuals with sensitivities and allergies, all students, faculty, staff, employees of any companies working on university property, visitors, and guests of Acadia University, or of members of the University community are asked to refrain from wearing scented personal care products such as perfumes / aftershave, lotions, hair spray and deodorant. In addition,

users of tobacco and cannabis are asked to be aware that odours associated with product use may impact individuals with sensitivities and allergies. Acadia University in consultation with its contracted cleaning staff, have agreed to use products that do not leave residual odors that may cause difficulties for individuals with sensitivities and allergies.

Part 6: Program Learning Outcomes

Foundations of knowledge		**Course specific examples**	**Proficiency** 1-Introduction 2-Reinforcement 3-Proficient
Scientific method, inquiry and hypothesis testing	Find, understand and apply information from the literature; understand how to use the scientific method to examine problems from different perspectives	Experimental design, statistical models, normal distributions, variation.	2
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Historical male bias/privilege in science; profiling discoveries of women and members of underrepresented minority groups	1
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Acadian Forest and Bay of Fundy ecosystems		0
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Natural selection, selective pressures, adaptation	2
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	How organisms are intimately linked to environments	3
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Application of scientific method	1
Safety	Work safely and productively in lab and field settings	WHMIS and lab safety considerations	2
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Experience with basic lab skills and computer-based data acquisition systems.	2
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change		0
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	Collect data, analyze statistically, prepare graphic and tabular output	2
Statistical analysis	Use R and or other programs to analyze biological data	Use R and other programs	2
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity and understand the principles of EDI in science	Review literature considering ethics, EDI and academic integrity	2
Collaboration and group work	Work effectively in groups within and across disciplines	Case study work in groups	2
Critical thinking	Analyze and evaluate information to make science-based decisions	Case study work in groups	2
Computer proficiency	Use common and discipline- specific software	Use of software/hardware in data acquisition	2
Scientific communication	Communicate science effectively to both scientific and general audiences	Peer review of literature; criticism	2