



Course ID:	Course Title:	Fall 2023
BIO 270-1	Introduction to Neuroscience	Prerequisite: PS 121
		Credits: 3

Class Information		Instructor Information		Important Dates	
Delivery:	In Class	Instructor:	Dr. Alan Ho, PhD, MSc, BSc	First Day of Class:	Sept. 6
Days:	Tue/Thurs	Email:	aho@ambrose.edu	Last Day to Add/Drop:	Sept. 17
Time:	4:00–5:15pm	Phone:	403-410-2100 x5911	Last Day to Withdraw:	Nov. 20
Room:	A2133	Office:	L2088	Last Day to Apply for Coursework Extension:	Nov. 23
Lab/Tutorial:	NA	Office Hours:	By Appointment Only	Last Day of Class:	Dec. 11
Final Exam:	A2133; Dec. 14 th , 1-4 pm				

Course Description

An introduction to the study of neuroscience and neuropsychology. Attention is given to the foundational issues of studying neurochemistry and experimental techniques related to the structure and function of the nervous system and brain.

Further Course Information:

- Neuroscience is a multi-disciplinary, scientific study of the brain’s structures and functions.
- For over half a century, neuroscientists have discovered and confirmed how membrane-ion interactions can provide effective information processing within each neuron and signaling across neurons.
- Neurons that constitute separate sensory and motor pathways selectively spread their activities to one another inside their specific pathways, forming intricate neural networks that integrate processed information for each sensory modality and motor subdivisions.
- Activity from different coordinated sensory neural networks inside the brain allow humans to sense, perceive, and interpret various physical stimuli from the external environment and within the human body.
- Ultimately, the activity of these coordinated neural networks lead to the generation of complex mental functions such as emotions, thinking, and decision making; functions that produce corresponding overt behaviour in a person such as body gestures, language, and spontaneous action and reaction in response to changes in the person’s environment.

Expected Learning Outcomes

By the end of this course, students will be able to:

1. Describe psychological methods and epistemological challenges related to the study of neuropsychology and neuroscience.
2. Identify and describe the fundamental components of the nervous system and discuss the relationship between their structures and functions.
3. Explain how neurons are capable to generate electrical signals and the principles behind signal transduction.
4. Explain the process of chemical communication within the nervous system.
5. Evaluate and interpret various theories and research data related to synaptic plasticity which made construction of functional neural circuits possible within the nervous system.
6. Produce a thoroughly researched term paper on a relevant topic in neuroscience, demonstrating the ability to locate, evaluate, and synthesize pertinent research articles. Present logical arguments in support of chosen thesis statements, applying critical thinking and analysis skills.

Textbooks

- Augustine, G., et al. editors (2023) *Neuroscience* (7th ed.). New York, NY: Oxford University Press.

Course Schedule

Sep 7	Course organization
Sep 12, 14*	Chapter 01 - Studying the Nervous System
Sep 19, 21*	Chapter 02 - Electrical Signals of Nerve Cells
Sep 26, 28*	Chapter 03 - Voltage-Dependent Membrane Permeability
Oct 3	<i>Midterm I (Ch. 1 - 3), 20%.</i>
Oct 5, 10*	Chapter 04 - Ion Channels and Transporters
Oct 12, 17*	Chapter 05 - Synaptic Transmission
Oct 19, 24*	Chapter 06 - Neurotransmitters and Their Receptors
Oct 26, 31*	Chapter 07 - Molecular Signaling within Neurons
Nov 2	<i>Outline of term paper due, 5%.</i>
Nov 6 – 10	<i>Reading Week / Fall Module week (No Regular Classes)</i>
Nov 14	<i>Midterm II (Ch. 4 - 7), 20%.</i>
Nov 16, 21*	Chapter 08 - Synaptic Plasticity
Nov 23, 28*	Chapter 23 - Construction of Neural Circuits
Dec 4	<i>Term Paper Due, 20%.</i>
Nov 30, Dec 5, 7*	Chapter 09 – Vision
Dec 14	<i>Final Exam (Ch. 1 – 9, & 23), A2133; 1-4pm. 25%.</i>

Requirements:

1) *Online Quizzes (1% x 10 = 10%):

Each week after a chapter gets covered in class (*between Sep 14th – Dec 7th), a short online quiz (1% course mark) containing 10 multiple choice questions will be posted on Moodle for students to assess their understanding on materials learned during the week. **You will have 48 hours (between 6 pm Sunday – 6 pm Tuesday) to complete the quiz, the time limit for each quiz is 10 minutes. You will lose 1% mark for each missed quiz. No make-up quiz will be offered after the allotted schedule.**

2) Two midterms (20% x 2 = 40%) & a final exam (25%):

The two midterm exams will cover material for the identified chapters only while the final exam is a cumulative exam (i.e., covers all chapters taught in class). **The midterms will contain a mixture of up to 40 multiple-choice questions, 10 short answer questions (e.g., definitions, explanation of concepts/theories in writing/graphical illustration, research methodology, interpretation of empirical data, etc.) and 2 short essays (require thorough understanding and integration of information to synthesize the correct answers) based on the textbook chapters as well as class notes. The final exam will contain up to 60 multiple-choice questions, 20 short answer questions and 4 short essay questions. (Note that the % mark allocated to the untested chapters in the final exam is at least 75%.)** You are strongly encouraged to make use of the online study material on the textbook website to enhance your learning and understanding of the subject matters.

3) Term Paper Outline (5%) and completed paper (20%):

You may choose any topic of interest covered in our course syllabus to write a research-based critical review.

(Students who desire to work on topic areas not covered in the course syllabus must discuss with the instructor to receive approval prior to begin their writing.) **You are expected to use and make reference to your textbook and at least six (6) scholarly resources** (i.e. peer-reviewed journal articles) to provide supportive arguments for your theses in the paper. The length of the paper will be **1,400 (+/- 100) words** (APA 7ed writing format; double-spaced and 12-point Times-Roman font etc.) *not including those typed on the title and reference pages.* In your research-based critical review term paper, you would pay attention on presenting and discussing the main issues of your chosen topic strategically in a logical manner. For example:

- a) What are these issues and the current understanding of researchers?
 - b) Why are these issues important in the field of neuroscience?
 - c) How might these issues affect people's well-being in general when being resolved/unresolved?
 - d) What measures have researchers done in the past (i.e., their theory-driven research strategy and methodology – are they appropriate?) that might have resulted in *encouraging progress or failing to meet expectations* for solving the issues?
 - e) Is there any alternative theory-based interpretation for points a – d above?
 - f) What theory-based research would you suggest researchers to do next in order to make further progress? Justify your answer.
- **Submit a titled outline of your paper (due on Nov 2nd) with a reference list addressing points a – f above before writing your paper.**

- **Marks will be given based on the quality of information synthesized and presented in areas of structural organization, content, clarity and depth of thought, appropriate literature references, and *correct APA Citation and writing Style*** (See APA format 7th edition: http://www.apastyle.org/index.aspx?pa=2_156484152_242922758_1515037830_269349332_1504560227).
- This paper can also be co-authored by **two** students working together. This co-authored project will be between **2,500 – 2,800 words** in length (excluding those in title and reference pages) while using **your *textbook and at least 10 peer-reviewed journal articles*** as references. **You are strongly advised to peer-edit and revise the term paper before turn in for grading.** Please note that both authors will receive the same mark (%) and grade for the completed assignment, with no exceptions.
- The outline and completed term paper will account for 25% of the course grade. *The electronic copy of your finalized term paper (pdf file) will be **due at the end of Monday Dec 4th, 2022. Late assignment is accepted but with penalty** (i.e., 10% of paper's mark will be deducted per day, including weekends). **Students who fail to turn in this assignment by end of the last day of class (Dec 11th) will receive an F for the course.***
- *Your draft and finalized paper are due on the dates and times specified in the schedule. No extension will be granted. In the case of illness or other extenuating circumstances, exception will be made only with proof of an official medical document.*
- **Guidance on the term paper will be provided in consultation with the professor outside of class time.**

➤ Submission of Your Term Paper:

- *Your term paper (in pdf file) must be submitted electronically via Moodle to your instructor.*
- **All submitted term papers will be checked against plagiarism using the Turnitin software.** Please read the important information concerning **Academic Integrity** and **Plagiarism** explained in the Policies section at the end of this syllabus.
- **Two students co-authoring a term paper must submit their paper through only the first author's Moodle account.**

Attendance:

In the Social Science Department, we believe that learning is an active and interactive process, a joint venture between student and teacher and between student and student (i.e., *learning is not just "downloading" information from teacher to student*). Therefore, it is expected that professors will come to each class well-read and prepared to engage students on the topic at hand, giving students the utmost attention and respect. In turn, it is expected that students will take an active role in the learning process. This includes: (a) regular class attendance, (b) reading course material in advance of class, (c) showing up to class on time, and (d) attentively and proactively being "present" at class (i.e., *not on the internet, not texting, not conversing with the person beside you*). Committing to this type of "**active learning**" significantly increases the learning experience for both student and teacher, and reflects the Christian ethos of excellence and respect that lies at the heart of the Ambrose educational experience.

- *Please note that attendance at class is expected from each student. **For each unexcused absence, a student will lose 1% of course mark without exception.***
- **Exams and quizzes must be taken at the times specified. No extension will be granted.**

- *In the case of illness or other extenuating circumstances, exception will be made only with proof of an official medical document.*

Grade Summary:

The available letters for course grades are as follows:

Percentage	Letter Grade	Grade Point	Descriptor
96–100	A+	4.0	Excellent
91-95	A	4.0	
86-90	A-	3.7	
81-85	B+	3.3	Good
75-80	B	3.0	
70-74	B-	2.7	
67-69	C+	2.3	Satisfactory
63–66	C	2.0	
60–62	C-	1.7	
56–59	D+	1.3	Poor
50–55	D	1.0	Minimal pass
0–49	F	0.0	Fail
>50	P	No Grade Points	Pass

Because of the nature of the Alpha 4.00 system, there can be no uniform University-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor’s assessment of the level of each class, compared to similar classes taught previously.

Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

Ambrose University Important Information:

Ambrose University Important Policies & Procedures:

Registration

Registration is the process of selecting and enrolling in classes for upcoming semesters. Only students who are registered will be permitted to attend class and receive a grade for the course. You are responsible for ensuring that the courses you take are appropriate for your program, that they do not have any scheduling conflicts, that they have the necessary prerequisites and that they meet all degree requirements.

Withdrawal From A Course

Prior to the Add/Drop deadline: through the student registration system whereby course(s) will be removed with no academic or financial penalty. After the Add/Drop deadline and until the Withdrawal deadline: through submission of the 'Withdrawal from Course' form whereby course(s) will remain on the permanent academic record/transcript with the symbol 'W'. (See ambrose.edu/registrar/request-forms.) Students who withdraw from more than 30 credits attempted at Ambrose University will be required to withdraw from their program. Students considering withdrawing from courses are encouraged to discuss with their Faculty Advisor and/or the Office of the Registrar questions relating to their withdrawal decision specifically relating to financial assistance, study permit requirements, prerequisites for subsequent courses, readmission, and/or graduation timeline. Students who do not formally withdraw from a course are still considered registered in the course, even if they are no longer attending classes. In this case, students will be assigned a grade based on coursework completed as per the course syllabus and are responsible to pay the tuition and fees assessed for the course. Under extenuating circumstances, students may request from the Office of the Registrar a course(s) withdrawal after the Withdrawal deadline and until the last day of classes. Extenuating circumstances typically consider situations such as medical emergencies, compassionate grounds, or unforeseen conditions/situations beyond the students' control that arise after the start of the semester and are considered on a case-by-case basis. Supporting documentation from a physician or Registered Health Professional must accompany this request.

Coursework Extensions

Should a request for a time extension on coursework exceed the end of the term, a *Coursework Extension Application* must be completed and submitted to the Office of the Registrar. The extension (if granted) will be recorded on the student record. Extensions are granted at the discretion of the instructor and registrar. If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course. More conditions apply.

Exam Scheduling

Students who find a conflict in their exam schedule must submit a *Revised Final Exam Time Application* to the Office of the Registrar by the deadline noted in the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; or 2) the scheduled final examination slot results in three consecutive examination periods. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Communication

Your Ambrose email account is the University's primary and official mode of communication with you. Information delivered to your Ambrose email is considered official notification. Ambrose University is not responsible for your failure to receive important information delivered to your Ambrose email.

Lecture Recording

The recording of lectures or any other classroom academic activity, other than an audio recording as an accommodation, is prohibited except at the discretion of the instructor. Any use other than that agreed upon with the instructor constitutes academic misconduct and may result in suspension or expulsion. Permission to allow a lecture recording is not a transfer of any copyrights, so such recordings may be used only for individual or group study with other students enrolled in the same class and may not be reproduced, transferred, distributed or displayed in any public or commercial manner. Student must destroy recordings in any, and all formats at the end of the semester in which they are enrolled in the class. All students recording lectures, must sign the Permission Form to audio record lectures which is available through the Office of the Registrar.

Standards of Behaviour in the Classroom Setting

Learning is an active and interactive process, a joint venture between student and instructor and between student and student. Some topics covered within a class may lead to strong reactions and opinions. It is important that Students understand that they are entitled to hold contradictory beliefs and that they should be encouraged to engage with these topics in a critical manner. Committing to this type of "active learning" significantly increases the learning experience for both teacher and student, and reflects the Christian imperative to pursue truth, which lies at the heart of the Ambrose educational experience. However, active discussion of controversial topics will be undertaken with respect and empathy, which are the foundations of civil discourse in the Classroom Setting. Primary responsibility for managing the classroom rests with the instructor. The instructor may direct a student to leave the class if the student engages in any behaviour that disrupts the classroom setting. If necessary, Ambrose security will be contacted to escort the student from class.

Academic Integrity

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to acknowledge to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university. Students are expected to be familiar with the policies in the current Academic

Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. The academic calendar can be found at <https://ambrose.edu/academics/academic-calendar>

Privacy

Personal information (information about an individual that may be used to identify that individual) may be required as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@ambrose.edu.

Academic Success and Supports

Accessibility Services

Academic accommodation is provided to Ambrose students with disabilities in accordance with the Alberta Human Rights Act and the Canadian Charter of Rights and Freedoms. Provision of academic accommodation does not lower the academic standards of the university nor remove the need for evaluation and the need to meet essential learning outcomes. Reasonable accommodations are tailored to the individual student, are flexible, and are determined by considering the barriers within the unique environment of a postsecondary institution. It can take time to organize academic accommodations and funding for disability-related services. Students with a disability who wish to have an academic accommodation are encouraged to contact Accessibility Services as early as possible to ensure appropriate planning for any needs that may include accommodations. Staff can then meet with students to determine areas to facilitate success, and if accommodations are required, ensure those accommodations are put in place by working with faculty.

Ambrose Writing Services

Ambrose Writing services provides academic support in the four foundational literacy skills—listening, speaking, reading, and writing. It also assists students with critical thinking and the research process. Throughout the academic year, students can meet with a writing tutor for personalized support, or they can attend a variety of workshops offered by Academic Success. These services are free to students enrolled at Ambrose University. Academic Success serves all students in all disciplines and at all levels, from history to biology and from theatre to theology. To learn more, please visit <https://ambrose.edu/sas/writing-services>

Ambrose Tutoring Services

Ambrose Tutoring Services provides support in specific disciplinary knowledge, especially in high-demand areas such as chemistry, philosophy, math and statistics, and religious studies. These tutors also coach students in general study skills, including listening and note-taking. During the academic year, Ambrose Tutoring Services

offers drop-in tutoring for courses with high demand; for other courses, students can book a one-to-one appointment with a tutor in their discipline. These services are free to students enrolled at Ambrose University. To learn more, please visit <https://ambrose.edu/tutoring>.

Mental Health Support

All of us need a support system. We encourage students to build mental health supports and to reach out when help is needed.

On Campus:

- Counselling Services: ambrose.edu/counselling
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention Skills and can help you access mental health support. See <https://ambrose.edu/student-life/crisissupport> for a list of staff members.
- For additional wellness resources go to the Ambrose wellness page: <https://ambrose.edu/wellness>

Off Campus:

- Distress Centre - 403-266-4357
- Alberta Mental Health Helpline - 1-877-303-2642 (Toll free)
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

Sexual Violence Support

We are committed to supporting students who have experienced gender based sexual violence in the past or while at Ambrose. Many of the staff, faculty, and student leaders have received Sexual Violence Response to Disclosure training. We will support you and help you find the resources you need and you can access information about reporting. Information about the Sexual Violence policy and on and off campus supports can be found on our website— ambrose.edu/sexual-violence-response-and-awareness.

Off Campus:

- Alberta's Oneline for Sexual Violence - 1-866-403-8000 call or text
- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888
- Chat: www.calgarycasa.com

Note: Students are strongly advised to retain this syllabus for their records.