UNIVERSITY OF CALGARY

DEPARTMENT OF PSYCHOLOGY
Faculty of Arts

PSYC/NEUR 531	Nervous System Development	Winter 2024

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Office Hours: Open door policy, and by appointment (recommended to be sure that I'm around).

Lecture Location: SS 10
Lecture Days/Time: TR 11:00-12:15

Course Description

The function of the human brain is mediated by billions of cells and trillions of connections throughout the body. To understand human brain function, it is important to understand the processes involved in how these cells and connections arise, and the ways in which they change throughout a lifetime. The goal of this course is to provide a contemporary overview of central nervous system development, integrating anatomical, cellular, molecular, genetic, and behavioural approaches.

Course Learning Outcomes

The Department of Psychology is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate (see https://live-arts.ucalgary.ca/psychology/about#program-learning-outcomes), and the expected level of achievement.

Course Learning Outcomes	Assessment Methods	PLO(s)	Level(s)
Outline how the nervous system changes through a lifetime.	Multiple-choice, short-answer, long-answer exams; research paper	1, 4, 5	A
Describe how evolutionary change can be affected through changes in development.	Multiple-choice, short-answer, long-answer exams; research paper	1, 2, 4, 5	C
Explain the mechanisms involved in neural induction, cellular differentiation, and fate specification of neural cells.	Multiple-choice, short-answer, long-answer exams; research paper	1, 2, 4, 5	C
Contrast the molecular, physiological, and functional changes that occur in neuronal cells across the lifespan.	Multiple-choice, short-answer, long-answer exams; research paper	1, 2, 4, 5	A
Explain how synaptic connections are formed and modified during development.	Multiple-choice, short-answer, long-answer exams; research paper	1, 4, 5	A
Explain how interactions with the world continuously adapt the functional architecture of the brain.	Multiple-choice, short-answer, long-answer exams; research paper	1, 2, 4, 5	A

Outline the relationship between behavioural development and the structural and physiological aspects of brain development.	Multiple-choice, short-answer, long-answer exams; research paper	1, 4, 5, 7	A

Notes. PLOs = Program-Learning Outcomes: 1 = demonstrate knowledge of psychological sciences, 2 = think critically and solve problems, 3 = conduct research and analyze data, 4 = communicate effectively, 5 = demonstrate information literacy, 6 = understand and implement ethical principles in a diverse world, 7 = apply psychological knowledge and skills, 8 = Demonstrate multicultural competence and awareness of issues related to equity, diversity, and inclusion. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

Acknowledgments and Respect for Diversity

Our classrooms view diversity of identity as a strength and resource. Your experiences and different perspectives are encouraged and add to a rich learning environment that fosters critical thought through respectful discussion and inclusion. The Department of Psychology would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

Course Format

This is an in-person class held on campus.

Prerequisites

PSYC 475 or NEUR 475; and admission to the Neuroscience program, or Psychology major or Honours program.

Recommended Text

Breedlove, S. Marc (2017) Foundations of Neural Development, Sinauer Associates. The textbook can be purchased from the University of Calgary Bookstore, or an online retailer (eg. Amazon.ca). We will be covering the majority of the textbook in this course. Additional reading materials may be drawn from a collection of sources, including classic or contemporary journal articles and reviews in the field.

Assessment Methods

The final course grade will be based on:

- **Top Hat Participation:**
  - 5%
  - Ongoing.
  - Multiple-choice questions.
  - Covers material for the entire course, from lecture to lecture.
- **Midterm Exam 1:**
  - 25%
  - Tuesday, February 6, 2024. In-class (11:00am-12:15pm).
  - Multiple-choice, short-answer, and long-answer questions.
  - Covers in-class material from Chapters 1-3.
- **Midterm Exam 2:**
  - 25%
  - Thursday, March 14, 2024. In-class (11:00am-12:15pm).

- Multiple-choice, short-answer, and long-answer questions.
- Covers in-class material from Chapters 4-6.

- **Final Exam:**
  - 25%
  - Registrar scheduled.
  - Multiple-choice, short-answer, and long-answer questions.
  - Covers in-class material from Chapters 7-10.
- **Term Paper:**
  - 20%
  - Complete guidelines and the grading criteria breakdown will be provided on D2L.
  - Written on any topic in the field of nervous system development.
  - A maximum of 20 double-spaced pages, not including references. 12-point Times font.
  - An outline of the desired paper topic along with a bibliography containing at least 5 references must be emailed to the instructor by 11:59pm March 19, 2024, for approval.
  - A completed paper must be emailed to the instructor by 11:59pm on April 9, 2024.

Exams in this course are closed book. The use of resources, including class notes, the textbook, online resources, and calculators is prohibited during the exams in this course. Students may not communicate with others about course material or the exam either in person or electronically during exams.

Once approved by the course instructor, and at their discretion, alternative arrangements for missed assessments may be considered. https://www.ucalgary.ca/pubs/calendar/current/g-1-2.html. Students may be asked for documentation https://www.ucalgary.ca/pubs/calendar/current/m-1.html.

University of Calgary Academic Integrity Policy

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity.

Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional code of conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. It is your responsibility to ensure that you have read and are familiar with the student academic misconduct policy: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Academic-Misconduct-Policy.pdf.

Department of Psychology Criteria for Letter Grades

Psychology course instructors use the following criteria when assigning letter grades:

A+ grade: *Exceptional Performance.* An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

A, A- Range: *Excellent Performance.* Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student's thorough knowledge of subject matter.

B Range: *Good Performance.* Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

C Range: *Satisfactory Performance.* Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-.

D range: *Marginally meets standards.* Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met.* Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

It is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

Tentative Lecture Schedule

Date	Topic/Activity/Readings/Due Date
T Jan 9	First day of lectures. Introduction and Knowledge Inventory
R Jan 11	Chapter 1 – Gene Expression and Cell Fate
T Jan 16	Chapter 1 – Neural Induction
R Jan 18	Last day to drop a class without financial penalty. Chapter 2 – Establishing Polarity
F Jan 19	Last day to add or swap a course.
T Jan 23	Chapter 2 – Neural Patterning
R Jan 25	Chapter 3 – Neurogenesis
F Jan 26	Fee payment deadline for Winter Term full and half courses.
T Jan 30	Chapter 3 – Brain Growth
R Feb 1	Review Session
T Feb 6	Midterm 1
R Feb 8	Mid-Semester Check-In and Interest Day

T Feb 13	Chapter 4 – Neural Differentiation
R Feb 15	Chapter 4 – Neural Cell Subtypes
Feb 18-24	Term Break, no classes.
T Feb 27	Chapter 5 – Axon Growth
R Feb 29	Chapter 5 – Axon Guidance
T Mar 5	Chapter 6 – Synapse Formation
R Mar 7	Chapter 6 – Synapse Maturation
T Mar 12	Review Session
R Mar 14	Midterm 2
T Mar 19	Mid-Semester Check-In and Interest Day
R Mar 21	Chapter 7 – Apoptosis
T Mar 26	Chapter 7 – Sex Determination and Sexual Dimorphism
R Mar 28	Chapter 8 – Activity-Guided Neural Development
T Apr 2	Chapter 9 – Experience-Guided Neural Development
R Apr 4	Chapter 10 – Socially Guided Neural Development
T Apr 9	Review Session Winter Term Lectures End. Last day to withdraw with permission from Winter Term half courses.
Apr 12-23	Winter Final Exam Period.

Extra Research Participation Course Credit is Not Offered for this Course.

Seating During Exams

Instructors and exam invigilators are free to ask students to move seats before an exam begins or even during an exam. Students must comply with this request and refusal to do so may warrant a charge of academic misconduct.

Absence From Test/Exam

Makeup tests/exams are **NOT** an option without the approval of the instructor.
https://www.ucalgary.ca/pubs/calendar/current/g-1-1.html
At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Once approved by the instructor a makeup test/exam must be written within 2 weeks of the missed test/exam on a day/time scheduled by the instructor. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam.
https://www.ucalgary.ca/registrar/exams/deferred-exams

Travel During Exams

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to write a make-up exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam:

Deferred Final Exams | University of Calgary (ucalgary.ca)
Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology (psyugrd@ucalgary.ca).

Reappraisal of Graded Term Work http://www.ucalgary.ca/pubs/calendar/current/i-2.html
Reappraisal of Final Grade http://www.ucalgary.ca/pubs/calendar/current/i-3.html

Academic Accommodations
Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their instructor. The full policy on Student Accommodations is available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf.

Academic Misconduct
For information on academic misconduct and its consequences, please see the University of Calgary Calendar at http://www.ucalgary.ca/pubs/calendar/current/k.html.

Instructor Intellectual Property
Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments, and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed, or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Copyright Legislation
All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://library.ucalgary.ca/services/copyright?_gl=1*bcjlpn*_ga*OTY1ODc0Njg0LjE2NjkxNTA1NTM.*_ga_X4GN9Y4W7D*MTY3Nzc5MjM3Ni4xNy4xLjE2Nzc3OTI4MDYuMC4wLjA) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Freedom of Information and Protection of Privacy

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Student Support and Resources

https://www.ucalgary.ca/registrar/registration/course-outlines

Important Dates

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **Thursday, January 18th, 2024**. Last day add/swap a course is **Friday, January 19th, 2024**. The last day to withdraw from this course is **Tuesday, April 9th, 2024**.