

Psyc/Neur 531		Nervous System Development		Winter 2023	
<b>Instructor:</b>	Richard Dyck	<b>Lecture Location:</b>	SA 235		
<b>Phone:</b>	403-220-4206	<b>Lecture Days/Time:</b>	TR 11:00-12:15		
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<b>Office Hours:</b>	By appointment				

### Course Description

The function of the human brain is mediated by billions of cells and trillions of connections. In order to understand human brain function it is important to understand how these processes arise, and the ways in which they change throughout a lifetime. The goal of this course is to provide a contemporary overview of CNS development from comparative, biological, behavioural and clinical perspectives.

### 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- and long-answer exams; research paper	1, 4, 5	C
Explain how evolutionary change can be effected through changes in development	Same as above	1, 2, 4, 5	C
Explain the mechanisms involved in cellular differentiation and fate specification of neural cells	Same as above	1, 2, 4, 5	C
Explain the molecular, physiological and functional changes that occur in neuronal cells across the lifespan	Same as above	1, 2, 4, 5	A
Explain how synaptic connections are formed and modified during development	Same as above	1, 4, 5	C
Explain how interactions with the world continuously update and adapt the brain's functional architecture.	Same as above	1, 2, 4, 5	A
Outline the relationship between behavioural development and structural and physiological aspects of brain development	Same as above	1, 4, 5, 7	A
Explain how abnormalities in developmental mechanisms lead to brain disorders		1, 2, 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, 7 = apply psychological knowledge and skills. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

### **Course Format**

This is an in-person class held on campus.

### **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.

### **Prerequisites**

312 or 300 and 301, 475, and admission to the Psychology/Neuroscience major

### **Required Text**

The required text for the course is: Breedlove, S. Marc (2017) Foundations of Neural Development, Sinauer Associates. The textbook can be purchased from the UCalgary Bookstore or online (eg. Amazon.ca). We will be covering a majority of the textbook. Additional reading materials may be drawn from a collection of sources, including classic journal articles in the field, more recent reports and review papers.

### **Assessment Methods**

The final course grade will be based on:

- 1) Midterm 1 examination: 25%
  - a. In class, Feb 14
  - b. Short answer and Long answer/essay questions
  - c. Examines information covered in Chapters 1-3, in class, and any additional readings or presentations
- 2) Midterm 2 examination: 25%
  - a. In class, Mar 9
  - b. Short answer and Long answer/essay questions
  - c. Examines information covered in Chapters 4-6, in class, and any additional readings or presentations since the midterm 1 examination.
- 3) Final examination: 30%
  - a. 150 minutes – registrar scheduled
  - b. Multiple choice, short answer and Long answer/essay questions
  - c. Examines information covered in Chapters 7-10, information covered in class, and any additional readings or presentations since the midterm 2 examination.
- 4) Term Paper: 20%
  - a. On any topic dealing with normal or abnormal nervous system development.
  - b. **Maximum** of 20 double-spaced pages, not including references.

- c. 12 point Times font (about 15 characters/inch).
- d. The paper topic, in the form of an outline, must be emailed to the instructor no later than 6:00 pm Monday, March 22nd. **Late submissions are not accepted without approval from the instructor.**
  - i. **Reduction of final paper grade by 5% for each 24h interval that the paper outline is late.**
- e. Paper will be graded on two criteria: **presentation (4%)**, including grammar, organization, clarity of writing, and other skills pertaining to written English, and **content (16%)**, including the accuracy of information presented, etc.
- f. Paper to be e-mailed before 6:00pm April 14th, 2023. **Late submissions are not accepted without approval from the instructor.**
  - i. **Reduction of 10% for each 24h interval that the paper is late, including weekends.**

### **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/policies/files/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%

As stated in the University Calendar, 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 (revise and add columns & rows as necessary)
T Jan 10	First day of TR lectures
R Jan 12	Introduction; Chapter 1– Cell Differentiation and Neural Induction
T Jan 17	Chapter 1– Cell Differentiation and Neural Induction
R Jan 19	Chapter 2– Development of a Body Pattern; Last day to drop a class without financial penalty
Jan 20	Last day to add or swap a course
T Jan 24	Chapter 2– Development of a Body Pattern
R Jan 26	Chapter 3– Neurogenesis and Migration
Jan 27	Fee payment deadline for Fall Term full and half courses.
T Jan 31	Chapter 3– Neurogenesis and Migration
R Feb 2	Review
T Feb 7	Chapter 4– Neural Differentiation
R Feb 9	Chapter 4– Neural Differentiation
T Feb 14	Midterm 1
R Feb 16	Chapter 5– Axonal Pathfinding
Feb 20	UNIVERSITY CLOSED Alberta Family Day
Feb 19-25	Term Break
T Feb 28	Chapter 5– Axonal Pathfinding
R Mar 2	
T Mar 7	Chapter 6– Synapse Formation and Maturation
R Mar 9	Midterm 2
T Mar 14	Chapter 7– Apoptosis
R Mar 16	Chapter 7– Apoptosis
T Mar 21	Chapter 8- Activity-Guided Neural Development

R Mar 23	Chapter 8- Activity-Guided Neural Development
T Mar 28	Chapter 9– Experience-Guided Neural Development
R Mar 30	Chapter 9– Experience-Guided Neural Development
T Apr 4	Chapter 10- Socially Guided Neural Development
R Apr 6	Chapter 10- Socially Guided Neural Development
Apr 7	UNIVERSITY CLOSED Good Friday
Apr 10	UNIVERSITY CLOSED Easter Monday
T Apr 11	Review
Apr 12	Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.
Apr 15-26	Final Exam Period

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

### Absence From A 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](mailto: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/](http://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 [University of Calgary : B.6.1 Accommodation of Students with Disabilities or Medical Conditions \(ucalgary.ca\)](#)

### **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 ([www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf)) 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 19, 2023**. Last day add/swap a course is **Friday, January 20, 2023**. The last day to withdraw from this course is **Wednesday, April 12, 2023** [University of Calgary : Academic Schedule \(ucalgary.ca\)](#)