

Biology 367 Neurobiology: Molecules to Behaviour

Spring 2025

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- Instructors: Dr. K. Delaney
- Email: kdelaney@uvic.ca
- Phone: 250 472 5657
- Office: Cunningham 259A
- Office hours: Available for 30 minutes after each lecture or by appointment

Information in this outline is current as of Jan. 1, 2025 and subject to update. Any changes to the outline will be advertised in lecture and available on BrightSpaces.

This course is offered as in-person only. Lecture Powerpoints will be posted on Brightspace in advance of lectures. Recordings of lectures will not be posted.

• **Intended learning outcome:** The objective of the course is to have students acquire knowledge of the principles nervous system function through understanding of the cellular properties of neurons and their integration into neural circuits to produce behavior and perception. Both qualitative descriptions and quantitative (numerical) evaluations of neuronal function will be undertaken with an emphasis on understanding the cellular and circuit-based processes that contribute to higher order sensory, motor and cognitive functions. Learning how to interpret data from graphical representations will be undertaken and required to attain a mechanistic understanding of cellular and network processes. The course will include a comparative approach examining neuronal function in a diversity of vertebrate and invertebrate organisms to illustrate these processes.

Topics to be covered include:

- Structure of neurons and nervous tissue
- Electrical properties of neurons including passive and active membranes, ion channels and receptors,
- Synaptic transmission between neurons: presynaptic and postsynaptic elements
- Synaptic plasticity: activity and neuromodulator dependent processes
- Learning and memory: plasticity at the cellular and systems level
- Sensory Systems: transduction of sensory signals, sensory system integration
- Motor Systems: motor control and motor system dysfunction (disease and injury)
- Physiological basis for higher order neural processes – Emotion, Addiction, Sleep etc.

• Course Evaluation:

Material tested in examinations will be derived directly **from material presented in class** and from sections of the course textbook **directly related** to material presented in class.

First lecture Jan. 06

Feb. 03 In-class Quiz – not a required course component (15% or 0%)

Feb. 24 In-class Midterm Exam - required course component (30% or 45%)

Final Exam – required course component (55%) Scheduled by U/G Records

The quiz is not a required course component and consequently there will not be any deferred quizzes. If the percentage score on the quiz is > the score on the midterm the grading scheme will be 15:30:55 if the midterm score is > the quiz score the grading scheme will be 0:45:55

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Missed Midterm examination: The midterm examination is a required component of the course. If a student cannot attend the scheduled midterm they must contact Dr. Delaney by email as soon as possible – e.g. within 24 hours or have a valid reason for not contacting within 24 hours, to determine when the make-up exam is scheduled. Completion of make-up exams is required before the class will provide answers to the exam questions and given the opportunity to review their midterm results.

Deferral of Final exam: If illness or other event prevents writing of the FINAL examination students must inform the instructor AND if a deferred exam cannot be completed as an in-course extension prior to the submission of class grades (an N (incomplete) grade will be submitted and the student must submit a Request for Academic Concession through the office of the registrar to obtain approval for the deferral and subsequently enable their N grade to become an A to F grade upon completion of the required course elements. Normally a deferred examination would be completed during the university's deferred exam period in July. For procedures see (<https://www.uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/index.php>)

- **Required (highly recommended) text:** Purves et al, Neuroscience 5th, 6th, or 7th ed. Note: The changes from the 5th to 7th edition are small and in the event of a conflict in information the lecture will clarify which is correct. Comparable material can be found in several substitute texts such as Principles of Neuroscience (Kandel et al.), Fundamental Neuroscience (Zigmond et al.) or Principles of Neurobiology (Quo) but it will be the responsibility of students using these texts as alternates to locate and identify the corresponding material in these texts.

- **Grading:** Marks will be assigned consistent with University Guidelines as follows: (see <https://web.uvic.ca/calendar2017-09/undergrad/info/regulations/grading.html>)

As per Biology Dept. policy **supplemental exams or assignments will not be offered.**

Students are to attend to ADD/DROP dates published in the Calendar and posted on the Undergraduate Records website. **Students must not assume they will be dropped automatically from any course they do not attend.** Students are responsible for checking their records and registration status.

- **Academic Integrity:**

It is assumed that you have read, understand and agree to adhere to the material at: <https://www.uvic.ca/students/academics/academic-integrity/index.php> and the consequences for violation of this policy