

# **BIOLOGY 447 Ion Channels and Disease Course Outline**

**Spring 2021**

**Department of Biology, University of Victoria**

## **Course Description:**

Electrical signals in neurons are produced by voltage-gated and ligand-gated ion channels. Any disturbance in the function of ion channels can lead to major neurological disorders. This course will give the opportunity for students to learn the structure and function of some of the major voltage- and ligand-gated ion channels and their relationship to channel related diseases. Mechanisms of ligand binding, gating and ion selectivity will be covered. The structure of the course will be based on lectures overviewing a topic and presentations and critical discussions of primary research papers. The course will also cover electrophysiological, fluorescence and crystallography techniques used to study structure-function of ion channels. We will also examine how alterations in ion channel function can contribute to specific nervous system disorders such as nicotine addiction and epilepsy.

## **Course Instructor:**

Dr. Raad Nashmi [raad@uvic.ca](mailto:raad@uvic.ca) “BIOL 447” in the subject line; Phone: 721-6169

**Time and Place:** Jan 11 - Apr 12, 2021; Mon, Thur 2:30 pm – 3:50 pm; synchronous online lectures on Zoom found at [uvic.zoom.us](http://uvic.zoom.us)

*Join the lecture by accessing through [uvic.zoom.us](http://uvic.zoom.us) with your Netlink ID and passphrase.*

**Office hours:** by appointment

**Reading Material:** There is NO required textbook for the course. Reading material will be based on primary research papers.

Assigned papers to specific classes can be found in a more detailed course schedule available online on **[bright.uvic.ca](http://bright.uvic.ca)**.

Students are expected to read ahead of time the assigned paper and participate in discussions of the paper in class.

Reading material, course outlines, and other material relevant to the course can be found at **[bright.uvic.ca](http://bright.uvic.ca)**.

*All course content and materials are made available by instructors for educational purposes and for the exclusive use of students registered in their class. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others requires the written permission of the instructor, except under fair dealing or another exception in the Copyright Act. Violations may result in disciplinary action under the Resolution of Non-Academic Misconduct Allegations policy (AC1300).*

**Prerequisites:** All students in Biology 447 must have successfully completed BIOL 365 or 360 as a prerequisite.

**Evaluation:**

First midterm exam 25% (tentatively February 8, 2021)  
Second midterm exam 30% (tentatively March 15, 2021)  
Final exam 45% (scheduled by Records)

**Midterm and Final Exams:**

Students must abide by [UVic academic regulations](#) and observe standards of ‘scholarly integrity.’ (no plagiarism or cheating). Therefore, online exams must be taken individually and not with a friend, classmate, or group. For online exams that are open book, you can have access to the lecture notes, text book but not internet searches (i.e. Googling) while completing this exam. You are also prohibited from sharing any information about the exam with others. You will affirm that you will not give or receive any aid on this exam or access any unauthorized resources and that all work will be your own.

Exams will be based on information covered in lectures and reading material.

Students are responsible for any material discussed in class, drawn on board, etc. Hence, attendance in class is strongly recommended. The final exam will be cumulative.

Failure to write a midterm test will result in a grade of 0% for the exam. If you miss the midterm test for a valid reason (illness, accident, family affliction, or sporting commitments as a UVic athlete), please contact the instructor as soon as possible (no later than 48 hrs from the date of the exam). No documentation is required for illness but provide suitable documentation for any other reasons. If you qualify for a missed midterm test, you will be accommodated so that you will not incur any penalty.

The final exam can be deferred in cases of documented illness, accident, family affliction, or sporting commitments as a UVic athlete. If you miss or expect to miss the exam for any of these reasons, please notify the instructor (no later than 48 hrs from the date of the exam). No documentation is required for illness but supporting documentation is required for other mentioned reasons. You must also fill out a Request for Academic Concession form, available from the Records office, as soon as possible in order to have your request for deferral considered. Travel plans are not a valid reason for missing the midterm test or the final exam.  
*No supplemental final exam will be given in this course as per Biology Dept. policy.*

**Grading:**

The final grade for the course, will be submitted as a percentage grade (rounded to the nearest whole percent by our spreadsheet program).

Please do not ask me to raise your grade and please do not ask us for extra-credit work to raise your grade; no such work is available.

**Academic regulations and policies:**

Please read the appropriate section of the current UVic Academic Calendar regarding your rights and obligations. In particular 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, available on Webview ([www.uvic.ca/reco](http://www.uvic.ca/reco)).

**UVic's Policy on Academic Integrity:**

The University and the Biology Department deal with cheating and plagiarism as a serious matter, since ignoring it could be interpreted as endorsing dishonest practice in one's later professional career. To claim ignorance of the University's policy on academic integrity is, therefore, not excused. Please read the policy carefully to avoid unpleasant misunderstandings.

The policy can be found on the online UVic calendar

([https://www.uvic.ca/calendar/undergrad/index.php#/policy/Sk\\_0xsM\\_V?](https://www.uvic.ca/calendar/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies)

[bc=true&bcCurrent=08%20-%20Policy%20on%20Academic](https://www.uvic.ca/calendar/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies)

[%20Integrity&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies](https://www.uvic.ca/calendar/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies)).

The University of Victoria Biology department reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.