

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

**Spring 2017**

**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. Students will learn to use bioinformatic tools to analyze the sequence and structure of ion channels. 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.

## **Instructor:**

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

**Time and Place:** Jan 5 - Apr 3, 2017; Mon, Thur 2:30 pm – 4 pm; Elliott Building 062

**Office hours:** by appointment, 259b Cunningham

**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 [coursespaces.uvic.ca](http://coursespaces.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 downloaded at [coursespaces.uvic.ca](http://coursespaces.uvic.ca).

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

## **Evaluation:**

Midterm exam 40%  
Assignments: 20%  
Final exam 40%

**Midterm and Final Exams:**

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

The final exam will be cumulative.

Failure to write the midterm test will result in a grade of 0% for the exam. If you miss the midterm test for a valid reason (documented 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) and provide suitable documentation for your absence. 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 and produce supporting documentation as soon as possible. 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.*

*You must be able to produce your UVic student identification card during the midterm test and final exam.*

**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)).