



UNIVERSITY OF CALGARY  
FACULTY OF SCIENCE  
DEPARTMENT OF BIOLOGICAL SCIENCES  
COURSE OUTLINE

1. **Course: ZOOLOGY 595 – Evolutionary Perspectives in Neurobiology**

Lecture Section: L01 TR 09:30-10:45 ST 063 WINTER 2018  
Instructor: Dr. W. Wildering BI 462 220-5283 wilderin@ucalgary.ca

Course materials, announcements and other course related information will be communicated through D2L (accessible under the following URL:

D2L: ZOOL 595 L01 - (WINTER 2018) - COMP NEUROMUSCULAR PHYSIOLOGY (W2018ZOOL595L01)

Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **PREREQUISITE(S):** Zoology 461

**ANTIREQUISITE(S):** Credit for both Zoology and Neuroscience 541 will not be allowed.  
See section 3.5.C in the Faculty of Science section of the online Calendar  
(<http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html>)

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

<b>Student presentation (30 min)</b>	<b>30 %</b>
<b>Final report (written)</b>	<b>35 %</b>
<b>Participation</b>	<b>35%</b>

There will not be a final exam scheduled by the Registrar's office.

Each piece of work (presentation and final report) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade. Each course participant presents a seminar on a topic commensurate with the course's goal. Participation will be graded on the basis of in class participation and questions about student presentations submitted to the course coordinator by email one day prior to each presentation.

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Min. Percent Required	96	91	86	82	78	74	70	65	60	55	50

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.3 of the University Calendar

5. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours. N/A

**REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.**

6. **Course Materials:** N/A

7. **Examination Policy:** Students should also read the Calendar, Section G, on Examinations.

8. **Writing across the curriculum statement:** In this course, the quality of the student's writing in reports will be a factor in the evaluation of those reports. See also Section E.2 of the University Calendar.

9. **Human studies statement:** See [Section E.5](#) of the University Calendar.

#### ETHICS IN THE BIOLOGICAL SCIENCES

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

#### 10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties.
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at [http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities\\_0.pdf](http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf).
- Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email [addy@ucalgary.ca](mailto:addy@ucalgary.ca) or phone 403 220-3140.
- (d) **Safewalk:** Campus Security will escort individuals day or night ([www.ucalgary.ca/security/safewalk](http://www.ucalgary.ca/security/safewalk)). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)  
SU Faculty Rep. Phone: 403 220-3913 Email: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca) and [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca);  
Student Ombuds Office: 403 220-6420 Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca); <http://ucalgary.ca/provost/students/ombuds>
- (g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h) **U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses ([www.ucalgary.ca/usri](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

Department Approval \_\_\_\_\_ ORIGINAL SIGNED \_\_\_\_\_ Date \_\_\_\_\_

Department Approval  
For NO Final Exam: \_\_\_\_\_ ORIGINAL SIGNED \_\_\_\_\_ Date: \_\_\_\_\_  
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## LEARNING OUTCOMES

This is a lecture/seminar course based on topics selected to present an overview of the organization and function of nervous system with a particular focus on its evolution of the nervous system. The course explores form, function and performance of invertebrate and vertebrate neurons and nervous systems through examination of physical, biochemical, metabolic, (neuro)physiological and behavioral constraints and trade-offs.

The course will cover a range of topics that may include; mitochondrial function and dysfunction, integration/regulation of energy demand and supply, plasticity of the nervous system, metabolic cost of learning and information processing, the economics of cell size, reliability and robustness of nervous system functions, and neural circuit organization. Other topics will be identified during the course in consultation with all participants on the basis of their interests and learning needs. References to key concepts will be given in advance and all students are expected to gain some familiarity and understanding of the subject prior to the relevant class. Seminars will be presented by students, faculty and guest lecturers. The course adopts problem-oriented, collaborative learning methods, emphasizing student initiative, in-class participation and problem solving skills.

### Tentative 2018 Lecture Schedule

- Lecture 1 – Introduction to the course
- Lecture 2 – Evolutionary origins of neurons and nervous systems
- Lecture 3 – Does being smart come at cost?
- Lecture 4 – Neuroenergetics I: energy budget of the nervous system
- Lecture 5 - Glutaminergic synapses I: molecular foundations of learning and memory
- Lecture 6 – Glutaminergic synapses II: performance and energy budget.
- Lecture 7 - Neuroenergetics II: economy of nervous system function and structure.
- Lecture 8 – Biophysical determinants of nervous system and sensory performance
- Lecture 9 – Primer to functional diversity ion channels
- Lecture 10 - Visual ecology of insects: electrophysiology of visual speed and sensitivity.
- Lecture 11 – Guest lecture on topic to be determined
- Lectures 12-24 – Student presentations on topics commensurate with course theme.

Note: topics of lectures may be varied without prior notice depending on instructional needs of class participants