

Biology 445 – Neuroethology

Winter Term 2018

Calendar description:

The current status of research in the study of the neural control of the natural behaviour of animals. Topics include the detection and coding of information in the environment, the integration of this information in the process of decision-making, the generation of the motor patterns that underlie behaviour, and general constraints on form and function of neural circuits.

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Office and Hours	3118 Biosciences Complex; TBA
TA:	TBA
TA Contact Information	TBA
Office Hours	TBA

Course Prerequisites:

BIOL 339 or PHGY 214 and a minimum GPA of 2.0 in the Biological Foundations List: BIOL 102/3.0; BIOL 103/3.0; BIOL 201/3.0; BIOL 202/3.0; BIOL 205/3.0; BIOL 206/3.0; BIOL 302/3.0; BIOL 303/3.0; BIOL 330/3.0; BIOL 334/3.0; BIOL 339/3.0; BIOL 341/3.0

Course Objectives:

At the end of this course students should be able to:

1. Demonstrate an understanding of the central principles of neuroethology
2. Search, read and understand the primary literature in neuroethology
3. Explain, orally and in writing, neural mechanisms that generate behaviour
4. Synthesize information from multiple sources to describe in detail a model system in neuroethology

Learning outcomes:

1. Identify neuronal mechanisms that generate motor patterns to establish a knowledge framework for neuroethology.
2. Distinguish principles of neural design to evaluate trade-offs between performance and cost.
3. Evaluate neuroethological data to judge their validity and importance for understanding neural mechanisms that control behaviour.
4. Compare neural mechanisms underlying behaviour of different organisms to understand their evolutionary constraints.
5. Research a specific topic to present a seminar on a model system in neuroethology.
6. Select, evaluate and summarize information from the primary literature to describe in detail neural solutions to a behavioural problem.

Learning Hours:

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture	3	12	36
	Seminar			
	Laboratory			
	Tutorial	1.5	12	18
	Practicum			
	Group learning			
	Individual instruction			
Other	Online activity	2	12	24
	Off-campus activity			
	Private study	4	12	48
Total hours on task				126

Course outline:

Introduction to Neuroethology
 Neurons and Synapses
 Circuitry and Pattern Generation
 Sensory Coding
 Behavioural Choice
 Parasites and modelling
 Genetic Constraints
 Evolutionary Constraints
 Ecological Constraints
 Developmental Plasticity
 Learning and Memory
 Consciousness

Evaluation:

1. Participation in tutorial – 15%
2. Assignment – 20%
3. Quizzes – 10%
4. Seminar Peer Evaluation – 10%
5. Seminar – 15%
6. Final exam – 30%

Assessment Policy:

All assignments must be fully completed and on time. Time penalties will be in effect for the late submission of assignments, unless certified medical documentation is provided. You are responsible for attending all lectures and for reading the specified assignments.

Last day to ADD/DROP – 19th January

Last Date to drop Winter term course without academic penalty – 2nd March

Academic Integrity

Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility (see www.academicintegrity.org). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive.

Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities

<http://www.queensu.ca/secretariat/policies/senateandtrustees/principlespriorities.html>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments conform to the principles of academic integrity. Information on academic integrity is available in the Arts and Science Calendar (see Academic Regulation 1

<http://www.queensu.ca/artsci/academic-calendars/2011-2012-calendar/academic-regulations/regulation-1>), on the Arts and Science website (see

<http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity>), and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Copyright of Course Materials

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Grading Method:

In this course, some components will be graded using numerical percentage marks. Other components will receive letter grades, which for purposes of calculating your course average will be translated into numerical equivalents using the Faculty of Arts and Science approved scale:

Arts & Science Letter Grade Input Scheme

Assignment mark	Numerical value for calculation of final mark
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
FO (0)	0

Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below