

**DEPARTMENT OF BIOLOGICAL SCIENCES  
UNIVERSITY OF TORONTO SCARBOROUGH**

**Course Outline - Summer 2020  
Animal Communication [BIOD45 LEC99]  
Instructor: Dr. Jeneni Thiagavel**

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**Course Description**

This course will examine the importance of communication in the organization of animal behaviour and the ecology, behavior, neurobiology, and evolution of animal systems. Neural processes concerned with learning, memory, and decision-making and their ecology and evolution will be explored as well as the diverse array of cognitive and behavioural mechanisms used by different animals. Topics considered will include comparative cognition, behavioural ecology, neuroethology and evolutionary neuroscience.

*Pre-requisite:* BIOC54

**Learning Objectives**

After successfully completing BIOD45, students should be able to:

1. Understand theory underlying selected areas of animal communication
2. Understand the principles of brain evolution that are conserved across vertebrates
3. Explain what makes the human brain unique among vertebrates
4. Describe methodologies used to study brain evolution
5. Read and interpret papers from the primary literature
6. Formulate a hypothesis and design an experiment to test that hypothesis
7. Identify gaps in the field and apply basic concepts of brain evolution to important scientific and societal issues

**Lectures:**

2 Hours per week- Online

Lectures will be pre-recorded and posted under 'Modules' on 'Quercus'

Lectures will be uploaded on:

Tuesdays [1 hour] &

Thursdays [1 hour, or 2 hours depending on the tutorial schedule]

**Tutorials:**

1 Hour per week -Online

Tutorials will be uploaded on:

Thursday [1 hour]

Tutorial sessions may be either of the following, depending on where we are as the course progresses: case studies of topics selected from primary literature on animal communication and brain evolution or student-led presentations [see course schedule at the end of the syllabus]. More information about tutorials will be provided during the first lecture.

### **The Teaching & Course Administration Team**

**Instructor:** Dr. Jeneni Thiagavel

Email: jenedi.thiagavel@mail.utoronto.ca

- All e-mails must be sent from your UofT email and must include the course code in the subject line
- Office hours: Blackboard Collaborate on Quercus [Wednesdays 2pm-4pm]

**TA:**

Andrew Masson (AJ) - andrew.masson@mail.utoronto.ca

- All e-mails must be sent from your UofT email and must include the course code in the subject line.

### **Course Website:**

- The main source of information for BIOD45 is Quercus [<https://q.utoronto.ca/>].
- The course syllabus, schedule, and lecture slides can be found here. Also, important information about the course including the dates and locations of exams will be posted here.

### **Textbook & Readings**

The following two textbooks are optional:

- *Principles of Brain Evolution*, Author: Georg F. Striedter
- *Principles of Animal Communication 2<sup>nd</sup> Ed*, Authors: Bradbury & Vehrencamp

Primary Literature Papers & Case Studies

- Lectures will be supplemented with more detailed examples drawn from classic and contemporary research in Animal Communication and Brain Evolution.
- Citation information/DOI's for the main papers relevant to these examples will be included on the lecture slides.

Lecture Slides: will be posted under 'Modules' on Quercus as both PowerPoint and PDF files on the day of the lecture

## Assessment/Exams

| Description                     | Weight |
|---------------------------------|--------|
| Online Presentation             | 15%    |
| Researcher for a day assignment | 15%    |
| Midterm Test                    | 30%    |
| Final Exam                      | 40%    |

### Assessments:

#### 1. Online Oral-presentation (15%)

Recent peer-reviewed journal articles which pertain to that week's topic will be presented by students.

Presentations will need to be pre-recorded on PowerPoint by the student.

Students will need to email their presentations to Dr. Thiagavel **by the end of day on the Thursday of their week** [2% off for every late day]

Topics will be selected on a first-come-first-serve basis. The schedule of the presentations can be found on our course schedule at the end of the syllabus.

*More instructions about (i) the assignment itself, (ii) how to record presentations, and (iii) topic selection will be provided in Lecture #1.*

#### 2. Researcher for a day (15%)

This assignment will be due by end of day on the student's presentation day

Students should

- (i) summarize the article they have presented and explain how it relates to a core principle they have learned in class.
- (ii) use the findings of the study as a launch pad to propose their own follow-up question, formulate a hypothesis, outline potential methods by which they can go about testing the hypothesis and explain how their results may better our understanding of neurobiology and animal behaviour.

This will allow students to make a connection between the general principles of animal communication & brain evolution they learn in the course and the implications they may have in the real world.

*Developing a research proposal:*

1. *Frame a research problem*
2. *Conduct a literature review*
3. *Devise a research design*
4. *Describe data collection procedures*
5. *Outline methods of analysis*
6. *Explain the importance of expected results*

Students will need to email their assignments to Dr. Thiagavel **AND your TA -Andrew Masson [AI]** **by the end of day on the Thursday of their week** [2% off for every late day]

*More instructions about (i) the assignment itself, (ii) how to record presentations will be provided in Lecture #1.*

### **3. Midterm Test (30%)**

- This test covers lectures 1-12 (inclusive) & student presentations
- The midterm test will be online [Quercus]
- Date & Time: TBD by the registrar's office
- Format: TBD

### **4. Final Exam (40%)**

- This exam will test content covered in lectures 1-24 (inclusive) & student presentations
- The final exam will be online [Quercus]
- Date & Time: TBD by the registrar's office [the exam will occur during the final exam period between August 18<sup>th</sup> -August 29<sup>th</sup>, 2020]
- Format: TBD

### **Missed Midterm Test or Final Exam:**

#### **Missed Midterm Test:**

- You will need to provide a UTSC medical certificate within 48 hours of a missed exam, if you wish to be considered for a potential make up exam.

- A makeup midterm exam may be offered to students who provide significant evidence of extreme circumstances/ illness. The structure of the midterm will differ from the normal midterm, as determined by the instructor.

### **Missed Final Exam:**

- you will need to declare your absence on ACORN and submit a petition via the registrar's office and provide them with documentation. The course instructor/ coordinator is not responsible for scheduling missed final exams.

*Note that it is not sufficient to simply visit a doctor's office; the documentation must show that you were incapable of writing the test or completing the assignment on [date] for medical reasons. The medical certificate must include the statement "[Name of student] was unable to write the test on [date] for medical reasons". Documentation must show the physician was consulted within one day of the test/exam. A statement merely confirming the report of an illness made by a student is not acceptable.*

Please note that the self-declaration of student illness reports cannot be used for any missed assessments in this course.

### **Academic Integrity**

<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes. All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters and could have serious consequences for students including suspension or expulsion from the university

### **Accessibility Needs**

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach the AccessAbility Services Office who is available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations

Phone: 416-287-7560; Email [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca)

## Course Schedule

| Week                       | Lecture                              | Topic   |
|----------------------------|--------------------------------------|---|
| Week 1<br>May 11 – May 15  | 1                                    | Introduction to the Course  |
|                            | 2                                    | Signals & Communication I   |
|                            | 3                                    | Signals & Communication II  |
| Week 2<br>May 18 – May 22  | 4                                    | Environmental Signals I   |
|                            | 5                                    | Environmental Signals II  |
|                            | 6                                    | Studying Brains   |
| Week 3<br>May 25 – May 29  | 7                                    | Whole Brain Size I  |
|                            | 8                                    | Whole Brain Size II   |
|                            |                                      | <i>Student Presentations- Topic: Signals &amp; Communication</i>      |
| Week 4<br>Jun 1 – Jun 5    | 9                                    | The Economics of Communication  |
|                            | 10                                   | Brain Evolution & Trade-Offs I  |
|                            |                                      | <i>Student Presentations- Topic: Whole Brain Size</i>                 |
| Week 5<br>Jun 8 – Jun 12   | 11                                   | Brain Evolution & Trade-Offs II                                       |
|                            | 12                                   | Sensory Systems & Brains I  |
|                            |                                      | <i>Student Presentations- Topic: Brain Evolution &amp; Trade-offs</i> |
| Week 6<br>Jun 15 – Jun 19  | 13                                   | Sensory Systems & Brains II   |
|                            | 14                                   | Sensory Systems & Brains III  |
|                            |                                      | <i>Student Presentations- Topic: Sensory systems &amp; Brains</i>     |
| Jun 22 – Jul 3             | Reading Week + Holidays (No Classes) |   |
| Week 7<br>Jul 6 – Jul 10   |                                      | <i>Student Presentations – Topic: Sensory systems &amp; Brains</i>    |
|                            |                                      | Midterm Test (2 hours)  |
| Week 8<br>Jul 13 – Jul 17  | 15                                   | Brain Region Size I   |
|                            | 16                                   | Brain Region Size II  |
|                            |                                      | <i>Student Presentations- Topic: Brain Region Size</i>                |
| Week 9<br>Jul 20 – Jul 24  | 17                                   | Brain Region Size III   |
|                            | 18                                   | Neural Pathways I   |
|                            |                                      | <i>Student Presentations- Topic: Neural Pathways</i>                  |
| Week 10<br>Jul 27 – Jul 31 | 19                                   | Neural Pathways II  |
|                            | 20                                   | Neuroanatomical Parameters I  |
|                            |                                      | <i>Student Presentations- Topic: Neuroanatomical Parameters</i>       |
| Week 11<br>Aug 3 – Aug 7   | 21                                   | Neuroanatomical Parameters II   |
|                            | 22                                   | Neuroanatomical Parameters III  |
|                            |                                      | <i>Student Presentations- Topic: Neuroanatomical Parameters</i>       |
| Week 12<br>Aug 10 – Aug 14 | 23                                   | Evolution of the Human brain I  |
|                            | 24                                   | Evolution of the Human Brain II                                       |
|                            |                                      | <i>Student Presentations- Topic: Evolution of the Human Brain</i>     |