

Ecology and Evolutionary Biology Graduate Courses 2016-2017

Updated Aug. 108, 2016

Note: Section Code: usually F, S or Y. This indicates whether the course is offered in the fall session (F), the winter session, i.e., second term (S) or over both (Y).

Graduate courses and seminars officially begin in the week of September 12th for September session courses (F) and January 9th for January session courses (S); however, some of the EEB graduate courses will not begin until the second week of classes—check with the course instructor

For information about graduate courses offered by other departments/groups that will be of interest to some EEB Graduate students (e.g. a course on R), please see the EEB Grad Course website: <http://www.eeb.utoronto.ca/grad/current/courses.htm>

EEB Graduate Courses Offered in Fall 2016:

EEB1210H F (1/4 course) Advanced Statistics [M-J. Fortin] 6 weeks

Day & Time: Tuesdays, 9:30-12:00 (starting September 13th) Location: St. George Campus, RW 015A

Biologists need to use statistical methods to test their hypotheses. Given the increasing complexity of experiments carried out by biologists, they need however to understand the limitations of these statistics and how to select the appropriate statistics for their needs and how to interpret them properly both statistically and biologically. The goal of this advanced course in statistics is to teach biologists how to choose and use statistics so that they can address relevant biological questions and test them with the appropriate methods. Specifically, an overview of advanced notions about regression and ANOVA will be presented. To do so, a combination of lectures and computer laboratory sessions will be used.

EEB 1310H F Philosophy & Methods [H. Rodd (team leader), Njal Rollinson, and guests]

Day & Time: Thursdays, 2-5pm Location: St. George Campus, Room TBA

The first class will be September 22, 2016

Description: This course will involve a combination of (i) student-lead discussions, (ii) lectures/discussions lead by faculty designed to cover general and often controversial scientific issues frequently confronted in both ecological and evolutionary studies, and (iii) short presentations by students introducing the background and context for their proposed research. This course is recommended for students just starting an MSc or PhD. It is intended to be a forum for students to enhance their current skills and understanding of how to do 'good' science and to discuss some issues that they will encounter as scientists. The class will read papers on and discuss topics that will include: human subjectivity and biases and their role in science; some semi-philosophical controversies about approaches to science and research tactics; some common and important pitfalls/errors in experimental design and statistical analysis (note: a strong background in statistics is not necessary for the course, but at least one undergraduate course in statistics is recommended); brief overviews of some new statistical approaches; and a variety other issues that are important to researchers (e.g. ethics). Faculty from the department and other guests will give brief, overview lectures to provide a bit of background on some of the topics (e.g. power analysis). The major assignment for the course is an essay that aims to facilitate students' progress in thinking broadly about their thesis research, before they write their thesis proposal; to this we ask the students to put their

research questions in the context of their general field (ecology or evolution)—both historically and with respect to the exciting questions currently being asked.

EEB1451H F: Special Topics in Ecology/Evolution: Parasites in Communities [B. Gilbert & N. Mideo]

Day & Time: Tuesdays (alternating weeks) 2-5pm *Location: St. George Campus, ESC 1014*

The course will meet in alternate weeks over the entire school year (September – April). ~~The first class will be Sept. 20, 2016~~

Please contact Ben Gilbert (benjamin.gilbert@utoronto.ca) and Nicole Mideo (nicole.mideo@utoronto.ca) ~~by Sept. 7 as soon as possible~~ if you are interested in taking this course. Please include the following information in your email: Your name; Your supervisor(s); Your degree program (MSc or PhD); Your year of student (e.g., I am in the 2nd year of a PhD); A couple of sentences about why you are interested in taking this course. Because of limited resources, they may not be able to accommodate all students showing an interest in this course.

There is a growing appreciation that parasites may not only make up the majority of species in a community but can fundamentally alter population dynamics, community assembly, ecosystem services, and evolution in complex environments. The goal of our course is to simultaneously review, understand, and contribute to this body of literature. Students will review the relevant literature pertaining to parasites in communities focusing both on classic papers and recent developments. Concurrently students (potentially in groups) will be required to develop an exciting and unanswered research question in the field then answer their questions using modelling, meta-analytic, or experimental approaches.

EEB1452H F (1/4 course) Special Topics in Ecology/Evolution: Mutualisms [M. Frederickson]

Date & Time: Wednesdays, 1-4pm (tentative) *Location: please contact Megan Frederickson (m.frederickson@utoronto.ca)*

A short (0.25 FCE) graduate course focused on the ecology and evolution of mutualism. We will pair chapters from the new *Mutualism* book (2015, edited by J.L. Bronstein, Oxford University Press) with recent empirical or theoretical papers from the primary literature. Book chapters/potential topics include macroevolution, coevolution, and evolutionary genetics of mutualism, as well as population and community ecology of mutualism, and mutualisms and global change. Students will give presentations and lead/contribute to discussions during the 2-3 hour sessions which will be held on six concurrent Wednesday afternoons, starting Sept. 21.

EEB1452 will meet for six 2-3 hours sessions starting Sept. 21 (21/09, 28/09, 05/10, 12/10, 19/10, 26/10).
Date & Time: Wednesdays, 1-4pm (tentative) *Location: TBA*

****Please see more graduate courses (with significant undergraduate content) offered in the Fall 2016 term listed below****

EEB Graduate Courses Offered in Winter 2017:

EEB1315H S (1/4 course) Professional Skills Development [M. Sokolowski, H. Rodd and others]

Day & Time: Thursdays, 4pm (tentative) *Location: St. George Campus, TBA*

A short (0.25 FCE) graduate-level course focused on developing the academic and professional skills required to succeed during and beyond graduate education in basic life sciences, with an emphasis on ecology and evolution.

EEB1315 will meet for approx. eight 2-3 hour sessions in alternate weeks (tentatively on Thursdays for 2017). The sessions will run from 3-6 or 4-7 depending on the availability of the guest participants. The class sessions will be comprised of A (see below) in some weeks and A+B in other weeks:

(A) Lecture and/or student led discussion and/or working group activities: 1-3 hours (depending on the schedule for that week). Topics will include converting CVs to resumes, informational interviews, speaking and writing for non-specialists, time and project management.

(B) Guest Panel Discussions: 1.5 hours. There will be 2-3 panel discussions over the duration of the course. Guest panelists will be chosen largely from the department's graduate alumni, and they will speak about their career pathways and the skills that they developed during their graduate education that they find valuable in their careers. They will be selected from a range of careers including government, industry, higher education

EEB1230H S Multivariate Statistics [D. Jackson] (tentative)

EEB1350H S Core Course in Evolution [A. Agrawal]

Graduate Courses with Significant Undergraduate Content:

(These courses will normally constitute only a minor component of the required credits for a graduate degree)

Fall courses:

EEB 1328H F Physiological Ecology [R. Sage]

Day & Time: Fridays, 10-12; Fridays, 1-3 *Location: St. George Campus, ESC 3087*

An advanced treatment of the physiological mechanisms controlling plant and animal distribution and ecological success. Topics of focus include photosynthesis and resource balance, water and nutrient relations, temperature effects, and adaptations to abiotic stress.

EEB 1421H F Special Topics in Ecology: Plant-animal Interactions [M. Frederickson]

Day & Time: Tuesdays & Thursdays, 1:00-2:00; Fridays 1:00-3:00 *Location: St. George Campus, RW 142*

Major concepts in ecology and evolution from the perspective of plant-animal interactions. The richness of interactions between plants and animals is explored including antagonistic interactions (herbivory), mutualistic interactions (pollination, seed dispersal, ant-plant associations), and interactions involving multiple species across trophic levels. There may be a field trip held on a Saturday or a Sunday; a small fee may be charged for field trip transportation.

EEB 1443H F Phylogenetic Principles [S. Stefanovic] (up to 5 grads)

Day & Time: Tuesdays and Thursdays, 10 am - 12 pm *Location: UTM; Room: IB 210*

Lectures will provide an in-depth coverage of modern methods of phylogenetic reconstruction including molecular systematics based on DNA sequences. The principles and philosophy of classification will be taught with an emphasis on 'tree-thinking', one of the most important conceptual advances in evolutionary biology. Tutorials will focus on recent developments in the study of evolutionary patterns while gaining proficiency in reading, presenting, and critiquing scientific papers.

*Shuttle Bus (Hart House to/from UTM) stop is right in front of this building (IB).

EEB 1460H F Molecular Evolution [D. Irwin & B. Chang] (up to 5 grads)

Day & Time: Wednesdays, 10 am – 11 am; Fridays, 10 am – 12 pm *Location: St. George Campus, TBA*

Processes of evolution at the molecular level, and the analysis of molecular data. Gene structure, neutrality, nucleotide sequence evolution, sequence evolution, sequence alignment, phylogeny construction, gene families, transposition.

Spring courses with undergraduate content:

EEB 1330H S Systematic Botany [J. Eckenwalder] (up to 3 grads)

Day & Time: Tuesdays and Thursdays, 1 pm – 2 pm; Thursday, 2 pm – 5 pm

Location: St. George Campus, ESC 3087/3088

The theoretical foundations of taxonomy and the types of evidence used in constructing plant classifications. Labs emphasize taxonomic characters and their uses. Includes an independent taxonomic project.

EEB 1340H S Comparative Plant Morphology [T. Sage] (no limit on grads)

Day & Time: Mondays and Wednesdays, 1 pm – 2 pm; Thursdays, 9 am – 12 pm

Location: St. G., ESC 3087/3088

This course focuses on land plant origins and subsequent diversification of land plant vegetative and reproductive form and function. Discussions synthesize morphological and anatomical knowledge from living organisms and fossil records with cellular, physiological, and molecular information on the developmental tool kit of land plants and their ancestors throughout geological time. Topics address the evolution of vegetative and reproductive meristems; stem, leaf, and root architecture; vascular tissue; the ovule habit; fertilization processes; and pollination biology.

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