

Syllabus BioC16 Evolutionary Genetics & Genomics

The course meets:

Lectures: Tuesdays: 1400h-1600h **&** **Tutorials:** Thursday: 1300-1500h

Course personnel

Course Personnel	Office Hours	Email
Instructor: Karen Williams, PhD	SW542 Tuesday 1600-1630h or by appointment	kd.williams@utoronto.ca
Teaching Assistant: Allan Edelsparre	SW558 TBA	a.edelsparre@utoronto.ca

Description: “This course will cover the fundamentals of modern ecological, evolutionary genetics and genomics. The course begins with an overview of genetic variation its measurement and the forces responsible for the origin and maintenance of variation. The remainder of the course describes the ecological and evolutionary origin of natural selection and the forces that shape genetic and genomic variation, within and between species. Emphasis will be placed on the experimental studies of natural variation and the relationship between theory and experiment.”

Course Goals: “To enable students to apply classic and modern genetic and genomic techniques to understand how variation is produced, maintained and distributed in populations.”

Learning objectives:

- Understand the agents of evolution important for changes in allele frequencies within a population
- Calculate Wright’s F-statistic used to describe population differentiation.
- Develop an understanding of quantitative genetics: Quantitative Trait Locus (QTL) mapping; reaction norms and phenotypic plasticity
- Understand the use of positive Darwinian selection in the evolution and maintenance of traits,
- To understand the evolution and maintenance of genes within a genome
- Explore epigenetic inheritance and its role in evolution
- Develop oral presentation skills needed to talk about evolutionary genetics and genomics
- Develop the skills and the confidence to read and to critically evaluate scientific papers.

Attend lectures, participate and take notes:

In this third year course attendance and participation in lectures is expected. Lectures will NOT be webcast. Lecture notes may be available 12 hours prior or posted after the lecture.

Communicate: Email

Contact information for instructor kd.williams@utoronto.ca and TA is available on above and may be on Quercus. Please use your U of T email address for all communication emails from other addresses may not receive a response. Conversations within Quercus may receive delayed responses.

Grading and Evaluation:

Grade %	Assignment	Due Date
35	Final Exam (3 hrs)	Final Exam period
25	Midterm test (in class)	26 February 2019
15	Presentation and Discussion	Ongoing
13 (9 x 1.44%)	Summaries	Each Tutorial week
7	Problem Set	22 March 2019
5	Participation and self-assessment	Ongoing
100		

Assessment policies:

Turnitin: "Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site".

Tutorials: Tutorials meet each week to discuss scientific papers. Participation and attendance in tutorials will greatly assist your understanding of the material. In each of 9 tutorials there will be student presentations (3 to 4 presentations per tutorial). Summaries are due at the start of the tutorial (1pm) and each summary consists of a précis with 4 questions for ONE of the papers to be presented in that tutorial.

Presentations: Oral presentations of a paper include a pdf presentation due at the start of the tutorial.

Midterm test: The term test will be held during class time and will likely include multiple choice and short answer questions. More information about the test and final will be posted on Quercus.

Problem set: The problem set will consist of questions related to lecture topics. The questions require calculations, and may involve multiple choice, short answer, matching or true/false.

Late Penalties

Summaries: late summaries will be given a zero grade.

Problem Set assignment: Late assignments will be penalized 5% per day (24 hours) of lateness to a maximum of 5 days of lateness.

Missed tests: There will be ONE cumulative make-up midterm exam (TBA) for those who have missed either the Midterm test and have a valid U of T medical certificate:

http://www.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf

Missed exam: If you missed the Final Exam please see Registrar's office.

Re-Evaluation requests: A written request for re-evaluation must accompany the assignment or test. All requests must be addressed to the instructor (email requests permitted) and must be received by April 17th 2019. Please be advised that the entire assignment or test will be evaluated and your grade may go up, down or may not change.

Academic Integrity

Please see UTSC resource links on Academic integrity:

<http://www.adfg.utoronto.ca/processes/acdiscipline/AcademicDisciplineResourcesLinks.htm>

Please see also UTSC student policy on "code of behaviour in academic matters" by following this link:

http://www.utoronto.ca/~stuaff/student_policies.html

Access Ability

Please follow the link below for UTSC student services related to Access Ability:

<http://www.utoronto.ca/~ability/>

Accommodation

Please see the link below for policies on religious accommodation and student conduct:

http://www.uts.utoronto.ca/~stuaff/student_policies.html

Equity

<http://www.hrandequity.utoronto.ca/Assets/HR+Digital+Assets/Equity+Resources/studentequity.html>

Textbook and supplemental material

Required Textbook: Conner JK & Hartl DL (2004) "A primer of ecological genetics" Oxford University Press. ISBN: 978-0878932023

Supplemental material: papers will be posted on Quercus and other helpful reference texts will be available on Course Reserves. There is a link to Course Reserves on Quercus.

Lecture and Tutorial Schedule:

Every effort will be made to follow this lecture schedule but it will likely change and the most up-to-date schedule will be on Quercus.

Date	Lecture Week	Lecture topic	Chapter in Text	Tutorial	Assignment	Tutorial topic
January 8-11	1	Introduction	1	none	none	
January 14 -18	2	Populations and variation	2	1	no Tutorial summary	Tutorial intro (TA)
January 21-25	3	Populations and allele frequencies	2	2	TS1	3 Papers:
January 28- February 1	4	F-statistics and population variation	3	3	TS2	4 Papers
February 4- 8	5	Quantitative genetics and heritability.	3 & 4	4	TS3	4 Papers
February 11- 15	6	Quantitative genetics: phenotypic plasticity	4	5	TS4	4 Papers
February 18-22		READING WEEK				
February 25 to March 1	Feb 26	Midterm Test 2:10pm		6	TS5	3 Papers
March 4 - 8	7	QTL mapping	4	7	TS6	4 papers
March 11- 15	8	Adaptation and positive selection	8 & 9, 14	8	TS7	4 papers
March 19 – 22	9	Genomics and applied genetics / TBA	3 & 18	9	TS9; Problem Set	4 papers
March 25 - 29	10	Life history behaviour, TBA	5 & 6	10	TS9	4 papers
April 1- 5	11	Evolution Development & and epigenetics	7 & TBA		Self - assessment	
Final exam period						