

EHJ352H EVOLUTION OF THE HUMAN GENOME (WINTER 2015)

TIME:

Lecture, Tues. and Thurs. 10:00-11:00 a.m. KP108

Tutorial, Thurs. 11:00-12:00 KP108

COURSE DESCRIPTION: In this course we explore human genome diversity and evolution, with a focus on current research. The course integrates applications of human evolutionary genomics to the understanding of human history and adaptation, the causes of disease, and genome structure and function. Topics include: comparative genomics, population genomics of adaptation, association mapping, repetitive/selfish DNA, and gene duplication.

COURSE OBJECTIVES:

Genomics, the study of the structure, function and evolution of the genome, is among the newest and most rapidly growing fields of both basic and applied science. Almost all of the traditional disciplines in biology are in the process of being revolutionized by genomic tools. The growing flood of data on the DNA, RNA and protein sequences of organisms provides unprecedented opportunities to address fundamental questions such as the causes of disease, the genetic basis of development, and the extent and causes of adaptive evolution. In this course, we aim to explain how genomics can be used to understand human evolution, and how evolutionary principles and analyses can be used to better understand genome structure and function. Focusing on the latest discoveries in human evolutionary and population genomics, we explore how the integration of evolutionary principles and genomic data inform us about the factors influencing genome structure, and about human origins, adaptation and disease.

PREREQUISITES: BIO150; BIO260/HMB265

CONTACTS:

INSTRUCTORS: Magdalena Bartkowska maggie.bartkowska@utoronto.ca (Lectures 1-10)
Stephen Wright : stephen.wright@utoronto.ca (Lectures 11-22)

TAs: Emily Josephs: em.josephs@utoronto.ca
Robert Williamson: robert.williamson@utoronto.ca

COURSE POLICY ON EMAIL USAGE:

Your email message must include in the Subject line the course identifier and a concise and clear statement of purpose [e.g., EHJ 352: I would like more background reading].

TEXT: Mark Jobling, Edward Hollox, Matthew Hurles, Toomas Kivisild, Chris Tyler-Smith (2013) Human Evolutionary Genetics 2ed.

Additional readings will be posted on Portal.

ACCESSING COURSE INFO:

Lecture slides, additional information, and additional required readings will be available via the UofT Portal on Blackboard.

EVALUATION: The marks will be assigned as follows:

Midterm 1	30%	In class: Jan. 29, 2015 (lect. 1-5)
Midterm 2	30%	In class: Feb. 12, 2015 (lect. 6-10)
Final exam	40%	Scheduled by the Registrar TBA
Total	100%	

MARKING SCALE TO BE EMPLOYED:

A+	90-100	C+	67-69
A	85-89	C	63-66
A-	80-84	C-	60-62
B+	77-79	D+	57-59
B	73-76	D	53-56
B-	70-72	D-	50-52

COURSE ORGANIZATION:

This course consists of 22 lectures by the instructors, based on the textbook readings and readings of original scientific articles.

The following topics will be covered (instructor initials in parentheses):

1. Introduction to the human genome (MB)
2. Background to evolutionary forces: mutation, selection, migration and genetic drift (MB)
3. Evolution of genome structure (MB)
4. Deleterious mutations and human evolution (MB)
5. Evolution of Sex Chromosomes (MB)
6. Human genome variation (SW)
7. Population genomics of speciation and human history (SW)
8. Genomics of adaptation (SW)
9. Evolution of Gene Expression (Emily Josephs)
10. Population genomics of disease (SW)

EXAMS:

The midterms are each worth 30% and will be held in your regular lecture period (see schedule for date). The final exam will be held during the formal exam period, and will be scheduled by the registrar. Students are expected to be available throughout the final exam period.

All exams will consist of multiple choice and short-answer questions, emphasizing the

understanding of concepts (rather than factoids). No study aids of any type are permitted during the exams. You must bring a pencil to each exam. All exams will last approximately 2 hours.

Students who have a legitimate reason for missing an exam (consult University guidelines for details) should inform the instructor **within 24 hours**. It is the student's responsibility to ensure they have the proper documentation for missed exams and to follow proper procedures. Students missing an exam will write a **make-up exam that may be of a different format** than the in-class exam (short- answer, problems, essays).

TUTORIALS: Tutorials are held in 108 KP (Thursdays 11-12) and will be run by your knowledgeable and enthusiastic TAs. Tutorials begin January 15th. Tutorial assignments and quizzes will not count towards your grade. These assignments and quizzes are intended to deepen your understanding of material that will be covered on midterms and the final.

ACADEMIC INTEGRITY:

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently.

According to Section B of the University of Toronto's Code of Behaviour on Academic Matters (www.artsci.utoronto.ca/osai/students), which all students are expected to know and respect, it is an offence for a student:

- To use someone else's ideas or words in your own work without acknowledging that those ideas/words are not your own with a citation and quotation marks, i.e., to commit plagiarism.
- To include false, misleading or concocted citations in your work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student.
- To submit your own work for credit where it has been previously obtained in more than one course without the permission of the instructor.
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are the most common. Please respect these rules and the values that they protect.

