

Instructor:

Dr. R. John Nelson, jnelson@uvic.ca
Office hours: by appointment

When and where:

Lectures: Mondays and Thursdays, 11:30-12:50, Clearihue Building A307

Course description: Molecular evolution is an exciting and rapidly developing field of study that is especially concerned with a) understanding how and why DNA sequences and genomes change, and b) reconstructing the evolutionary history of genes, genomes, and organisms. This course will cover a broad array of current topics in molecular evolution, spanning population genetics, phylogenetics, and genomics. The first portion of the course will provide an introduction to molecular population genetics and phylogenetics. The second portion will survey current topics and recent primary literature. There will be one mid-term exam, one final exam, one student presentation, one final paper, and computer exercises using population genetic, phylogenetic, and bioinformatics software. Details on the assignments will be provided in the lectures.

Textbook: There is no required text. There will be required readings consisting of journal articles and book chapters (uploaded onto Course Spaces or on reserve at the UVic library). A number of supplemental textbooks will also be placed on reserve at the library.

Grade Distribution and Important Dates:

Mid-term exam (Thurs. Feb. 4)	20%
Final exam (exam period, TBA)	25%
Presentation	20%
Outline for final paper (due Mon. Feb. 22)	5%
Final Paper (due Mon. Mar. 28)	25%
Computer exercises (due Mon. Mar. 3)	5%

Penalty for late submission of assignments: 5% per day.

If you miss (or know beforehand that you will be missing) a test or presentation because of illness, accident, family affliction, or commitments as a UVic athlete, you are required to contact the instructor in a timely manner after the test or presentation (within 72 hours). You are required to provide supporting documentation (example: a doctor's note, etc.) Documentation for such an absence will not normally be accepted beyond the 72 hours and will result in a mark of zero. Except in the case of a missed final exam, all paperwork and any special arrangements for an absence must be completed by the last day of classes. In the case of a missed midterm and upon approval of the instructor, the final exam grade will be used in place of the midterm in the final grade assessment.

Students are reminded that final exams in the Faculty of Science run from April 7 through April 22. Final exams will not be rescheduled for students who make travel plans that conflict with the officially scheduled final exam for this course.

The convention used for assigning letter grades is as follows:

A+ (90-100), A (85-89), A- (80-84), B+ (77-79), B (73-76), B- (70-72), C+ (65-69), C (60-64), D (50-59), F and N as per university regulations

Academic Integrity and Preventing Plagiarism and Cheating - Academic integrity matters are governed by UVic's Policy on Academic Integrity. **Please read this policy:** <http://web.uvic.ca/calendar2014/FACS/UnIn/UARe/PoAcI.html>

Please read these useful resources for avoiding cheating and plagiarism: a) UVic Libraries' plagiarism guide (<http://library.uvic.ca/instruction/cite/plagiarism.html>), and b) UVic Learning and Teaching Centre's information for students (<http://www.ltc.uvic.ca/initiatives/integrity/student.php>).

TENTATIVE LECTURE SCHEDULE

- 1 Mon. Jan. 4 Introduction & genetic variation
- 2 Thurs. Jan. 7 Population genetics: Genetic variation
- 3 Mon. Jan. 11 Population genetics: Mutation
- 4 Thurs. Jan. 14 Guest lecture
- 5 Mon. Jan. 18 Population genetics: Selection
- 6 Thurs. Jan. 21 Population genetics: Genetic drift
- 7 Mon. Jan. 25 Population genetics: Population structure
- 8 Thurs. Jan. 28 Molecular population genetics I
- 9 Mon. Feb. 1 Molecular population genetics II
- Thurs. Feb. 4 Midterm
- Feb. 8 – 12 **Reading Week**
- 10 Mon. Feb. 15 Phylogenetics I
- 11 Thurs. Feb. 18 Phylogenetics II
- 12 Mon. Feb. 22 Prokaryote genomes
- 13 Thurs Feb. 25 Eukaryote genomes
- 14 Mon. Feb. 29 Selfish genetic elements
- 15 Thurs. Mar. 3 Evolution of new genes and functions I
- 16 Mon. Mar. 7 Evolution of new genes and functions II: gene duplication
- 17 Thurs. Mar. 10 Rapidly evolving genes-Student presentations

- 18 Mon. Mar. 14 Sex chromosomes-Student presentations
- 19 Thurs. Mar. 17 Mitochondria and other organelles and symbionts-Student presentations
- 20 Mon. Mar. 21 Parasites and pathogens - Student presentations
- 21 Thurs. Mar. 24 Human molecular evolution- Student presentations -
- 22 Mon. Mar. 28 Easter Monday!
- 23 Thurs. Mar. 31 Speciation - Student presentations
- 24 Mon. Apr. 4 Student presentations -Wrap up and review