

**Department of Biology Course Outline**

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| BIOL 3200, Processes of Evolution  Term F, 2021 |

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| Course Description |
| The process and principles of evolution, the mechanisms by which genetic change occurs, the patterns of genetic variation and molecular studies that relate the structure of organisms to their evolution are examined. |

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| Prerequisites (strictly enforced) |
| SC/BIOL 2040 |

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| Course Instructor(s) and Contact Information |
| Dr. Elizabeth Clare  [eclare@yorku.ca](mailto:eclare@yorku.ca) |

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| Schedule |
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| Evaluation |
| Assessment will be based on an online discussion assignment (40%), question assignment (30%), and final exam (30%).  The course will also include additional optional assignments which are not assessed but can help students learn the course material. |

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| Important Dates |
| Term starts September 8th  Frist class September 9th  Reading week October 9-15th  Term ends December 7th  NOTE: to confirm important dates such as drop deadlines, holidays, refer to the “Important Dates” section of the Registrar’s Website at http://www.yorku.ca/yorkweb/cs.htm |

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| Resources |
| This course has no required text book. Evolutionary Analysis 5th edition by Herron and Freeman is useful for students who would like additional resources. Other resources will be discussed in class. We will use scientific literature to understand lecture examples. These will be provided with each lecture. |

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| Learning Outcomes |
| Upon successful completion of this course, students should be able to:  1) Use and apply key terminology, concepts and mechanisms  2) Predict the genetic consequences of evolutionary processes  3) Articulate key controversies and questions in the study of speciation  4) Improve communication and research skills  5) Recognise evolutionary principles in a range of topics  6) Use scientific literature to support an argument |

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| Course Content |
| This course will cover the principles of evolution at an advanced level. In the first few weeks of the course we will discuss the origins of life, natural selection, kin selection, sexual selection and adaptation, phylogeography and phylogenetics. After reading week the course will focus on the genetics of evolution. We will look at how allele frequencies change with different environmental and population scenarios such as founder effects, drift, selection and migration. In the final section of the course we will discuss the process of speciation and the theories which underpin these processes. We will discuss hybrid zones, mechanisms and processes of speciation, ring species models and biodiversity. Finally, we discuss species which don’t quite fit with our models and what we can learn from them.  **Course Content:**  The course is divided into three major themes  Part 1: Principles of evolution  Part 2: Genetic basis of evolution  Part 3: Speciation  Approximate Lecture Outline (subject to change)  **Part 1: Principles of Evolution**  Week 1 – Course introduction, History, Natural Selection  Week 2 – Evidence and Patterns in Evolution, Adaptation  Week 3 – Evolution of Sex and Sexual selection    Week 4 – Kin Selection, Genome Evolution, Origin of life  Week 5 – Phylogeography and Phylogenetics  Week 6 – No Classes – Reading Week  **Part 2: Genetics Basis of Evolution**  Week 7 – The Genetic Basis of Evolution  Week 8 – Selection, Gene Flow and Mutation  Week 9 – Founder Effects, Inbreeding and Hybrid Zones  **Part 3: Speciation**  Week 10 – Are species real? Why should life be divided up into species?  Week 11 – Species Concepts and Mechanisms of Speciation  Week 12 – DNA Barcoding and Biodiversity  Week 13 – Ring Species and Problems in Species Diagnosis    Week 14 – Evolution in Action… examples of evolution we can watch |

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| Experiential Education and E-Learning |
| This course will be conducted online.  Students will participate in a group discussion and apply scientific literature to that discussion. |

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| Other Information |
| Software: I will provide you with a simulation tool for exploring changes in allele frequencies. This tool does not work on chrome books. You are welcome to work together if you struggle to install the software. It is not a requirement that you use it, but it really helps understand the information and how I create the figures on my slides.  Extra assignments: I will provide you with extra assignments. These are not marked. They are a learning tool designed to help you test your own knowledge.  Reading material: There is no required text. Evolutionary Analysis is suggested only if you would like additional resources. We will use scientific literature which is required. In many cases I will talk about these papers during lectures. I will NOT ask you specific details from these resources on an assessment (e.g. what was the temperature of the experiment….) but I may ask you general questions about the subject, particularly if we have spent time on it in class. We will discuss how to use these papers in class. |

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| Course Policies |
| Email: Please put BIOL 3200 in the subject line. Please include your name and student number at the end of every email. Please allow 2 working days for an answer.  Missed assignment: If you miss an assignment for a documented medical reason, please inform the instructor as soon as possible on return to university activities. An alternative assignment will be provided.  Missed Final Exam: All students who miss the final examination must petition if they are seeking deferred standing via a Deferred Standing Agreement Form (DSA). Students must seek deferred standing by submitting a petition to their home faculty. The format of the make-up final exam for this course may be an oral exam, essay, short answer, and/or multiple choice.  Penalty for late submission of assignments: 10% per calendar day. |

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| University Policies |
| **Academic Honesty and Integrity**  York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty ([http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/).](http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/) The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.  There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students’ research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>  **Access/Disability**  York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.  Student's in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.  Additional information is available at the following websites:  Counselling & Disability Services - <http://cds.info.yorku.ca/>  Counselling & Disability Services at Glendon - <https://www.glendon.yorku.ca/counselling/>  York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>  **Religious Observance Accommodation**  York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an [Examination Accommodation Form](https://registrar.yorku.ca/pdf/exam_accommodation.pdf) at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam\_accommodation.pdf  **Student Conduct in Academic Situations**  Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/> |