

## Division of Natural Science

<http://natsci.info.yorku.ca/>

## Course Outline

NATS1690, A, Evolution  
Fall/Winter, 2018-2019  
Mondays, 2:30 to 4:30 PM and Wednesdays, 3:30 to 4:30 PM, VC 135

## Course Instructor and Contact Information

**Dr. B. Barbara Czaban**  
342 Chemistry Building  
Email: [nat1690a@yorku.ca](mailto:nat1690a@yorku.ca)

**Course Email:** [nat1690a@yorku.ca](mailto:nat1690a@yorku.ca)  
**Course Website:** <http://moodle.yorku.ca>.  
**Office Hours:** Email to set an appointment

Email Policies and Etiquette

- All course-related emails should be sent to the course email address ( [nat1690a@yorku.ca](mailto:nat1690a@yorku.ca) ).
- Emails should always be sent from your @my.yorku.ca account. Emails sent from other accounts (hotmail, gmail, yahoo, etc.) may be blocked and will not reach the course instructor.
- Please always fully identify yourself by including your full name and student number.
- All emails must include the course number in the subject line (nats1690) and a short description (for example: nats1690 – Test 1 grade is missing).
- Messages should be written in a professional manner (for example: begin with Dear Dr. Czaban, or Dear Prof)...
- Use proper grammar when writing your messages. Write in clear sentences. No slang, text lingo, or vulgar terms.
- Emails must not include attachments.
- The course instructor will normally answer all emails within 48 hours. However this may not always be possible. If you don't get a reply within several days, please re-send your message.

## Course Description

The central concepts of biological evolution are that all life on Earth shares a common ancestor and, that through the process of “descent with modification”, accumulation of modifications over time accounts for the changes and differences among modern life forms. As an introduction to biological evolution, this course examines biological mechanisms underlying evolutionary change, including the roles of cells, DNA, and genetics. An overview of embryological development will provide insight into biological mechanisms that drive changes in body structure during the evolutionary process. Other topics will include the history of evolutionary thought, cellular origins of life, evolution of cells, and a survey of forces driving evolution, including microevolution, speciation, and extinction. The laboratories will introduce students to several important biological techniques, material, and information relating to biological evolution.

**NOTE:** No previous background in any science is required for the successful completion of this course.

**Course Credit Exclusions:**

SC/NATS 1610 6.00, SC/NATS 1650 6.00, SC/NATS 1660 6.00, SC/NATS 1675 6.00.

**NCR Note:** This course is not open to any student who has passed SC/BIOL 1010 6.00 or who has passed or is taking SC/BIOL 1000 3.00 or SC/BIOL 1001 3.00.

**Course Learning Outcomes**

Upon successful completion of this course students should be able to:

**LECTURES**

- Discuss common misconceptions about evolutionary theory, natural selection, and adaptation.
- Explain biological evolution as the change in a population's gene frequencies over generations; and discuss how gene frequencies between generations change due to mutation, migration, genetic drift, non-random mating, and selection.
- Understand "descent with modification" and how it explains the unity and diversity of life.
- Explain what a phylogenetic tree is; understand the relationships between groups of species within a phylogeny and how to read and construct simple phylogenetic trees.
- Describe the historical development of evolutionary thought; explain evidence that supports the theory of evolution; and distinguish between scientific and non-scientific definitions of "theory".
- Discuss the observations that led to Darwin's conclusion that evolution occurred through natural selection; and explain how natural selection may lead to speciation.
- Recognize the interrelationships between the living world and environment; and apply this knowledge to understand the impacts of climate change and loss of biodiversity from the perspective of evolution.
- Apply scientific explanations to explain how life may have originated on Earth and how the changing conditions of the primitive Earth influenced the evolution of complex cells.
- Understand the basic molecular and cellular mechanisms underlying biological evolution, including gene expression, meiosis, and genetics; and appreciate why studying embryonic development helps explain evolutionary changes in body shape and evolutionary relationships between different organisms.
- Explain the Hardy-Weinberg equilibrium, the five conditions of a population that is in Hardy-Weinberg equilibrium, and how to determine if a population is evolving.

**LABORATORY**

- Appreciate how science is performed and how scientists work and think.
- Perform simple laboratory investigations, collect and analyze experimental data, formulate conclusions based on collected results, and communicate results in written format.
- Learn several methods of analysis relevant to studying evolution, including using Punnett Squares to predict outcomes of genetic crosses, applying the Hardy-Weinberg equation to calculate genetic variation in sample populations, and constructing and interpreting graphs.
- Work both individually and collaboratively to perform experiments.

## Evaluation

### Evaluation Components:

- **Four Term Tests = 75%**

All four tests will count toward the final course evaluation. Tests will consist mainly of multiple choice questions, but may include true/false, fill-in, matching, and short answer questions. Test content will be cumulative, with each new test covering approximately 75-90% of the new material covered since the previous test and the rest being from the content covered in previous tests.

Test Dates:

Test 1 – Monday Oct. 22, 2018. Start time: 2:30 pm. 90 minutes. 18.75%.

Test 2 – Monday Dec. 3, 2018. Start time: 2:30 pm. 90 minutes. 18.75%.

Test 3 – Monday Feb. 25, 2019. Start time: 2:30 pm. 90 minutes. 18.75%.

Test 4 – Monday April 1, 2019. Start time: 2:30 pm. 90 minutes. 18.75%.

- **Pre-Lab Assignments (10 assignments, lowest grade will be dropped) = 12.5%**

*(Please note that during FW1819, there may be fewer pre-lab assignments, due to the later start time of lab sessions.)*

Completed before lab class. Must be submitted before you will be able to begin the lab exercise. Based on background information presented in the Introduction to each lab. A pre-lab assignment is due at the first lab.

- **In-Lab Assignments (10 assignments, lowest grade will be dropped) = 12.5%**

*(Please note that during FW1819, there may be fewer lab assignments, due to the later start time of lab sessions.)*

Assignments will be completed during each lab session and submitted at the end of the lab period. For assignments to be accepted and graded, students must (1) be present for the duration of the lab session and (2) complete all lab work. All submitted work must be independently done.

**NOTE:** The final grade for this course is based **strictly** on the work done and the actual grades obtained for that work. To be fair and consistent to the entire class, individual grades are not negotiable and “extra credit” assignments are not provided at any point during or after the course. Please contact the course instructor about a grade **only** if there is a clear error (calculation, clerical, etc.) within two weeks of the grade being made available to you.

## Course Materials

**Required Textbook:** *An Introduction to Biological Evolution*, Custom Textbook. Barbara Czaban. Published by Nelson Education Ltd. Available in the York bookstore.

**Required Lab Manual:** *NATS 1690 Laboratory Manual*. Available in the York University Bookstore.

**Lecture Slides, Readings, Supplementary Videos and Materials, and Schedules** will be posted to the course Moodle website.

## Laboratory

This course includes a laboratory component, which is an independent mini-course and separate from the lecture portion of the course.

The essence of all science is experimentation and observation – and it is here, in the laboratory exercises, that you should get an appreciation of how science is performed and how scientists work and think.

The lab exercises are designed to illustrate several basic principles that govern life and to provide a hands-on approach to the study of evolution.

- **The laboratory component consists of ten 2 hour labs.** Approximately five labs will be held during the Fall semester and remaining labs will be held during the Winter semester. *(Please note that during FW1819, there may be fewer than 10 lab meetings, due to the later start time of lab sessions.)*
- The schedule of lab meetings will be listed in the detailed lab schedule that is posted in the Course Information Area of the course Moodle website. A copy of the schedule also will be posted outside the laboratory (128 Lumbers Building).

## Course Content and Format

Three lecture hours per week. Ten 2-hour labs, approximately every other week. Approximately five labs will be held during the Fall semester and remaining labs will be held during the Winter semester. *(Please note that during FW1819, there may be fewer than 10 lab meetings, due to the later start time of lab sessions.)*

- Lecture topics and readings will be posted in the Course Information area of the course Moodle site. Lecture slides will be posted in the Course Information area throughout the course.
- A lab schedule, showing the dates of all lab meetings for each lab section will also be posted in the Course Information area.

## Math Content

Minimal simple arithmetical calculation at about the Grade 11 level.

## Course Policies

### Questions and Concerns

Questions and concerns should be directed to the course instructor during class time (at the beginning or end of class) or you can email your questions to the course director ([nat1690a@yorku.ca](mailto:nat1690a@yorku.ca)).

### Conduct During Lectures and Labs

A major concern in large classes is students talking to other students during lectures. “Chatting” during lectures is disruptive and damaging to fellow students and the instructor.

Students are asked to respect others and the course instructor by not speaking unless invited to by the instructor. The volume should be turned off on cell phones and other devices during lectures.

If you arrive late to class or must leave early, please do so quietly.

### **Course Policies Regarding Assessments (Tests/Exams)**

- **Tests Dates, Start Times, and Locations**

It is the responsibility of each student to be aware of the dates, start times, and locations of all four term tests in this course. Missing a test due to not knowing this information will result in a zero on that test.

- **Conduct During Term Tests**

There will be no talking upon entering the exam room. The only items on your desk should be your student ID, pens, pencils, and erasers. All other items will be placed under your chair. All electronic devices will be turned off, put away, and kept under your chair. Earphones, ear pods, “smart watches”, and other electronic communicating devices are not permitted. Hats/caps must be removed.

**NOTE:** If students complete their test early, they will be permitted to leave the test/exam location after the first 30 minutes of the test, or after attendance is taken if it takes longer than 30 minutes to complete.

### **Course Policies Regarding Arriving Late to an Assessment**

- **Term Tests:**

If students complete their test early, they will be permitted to leave the test/exam location after the first 30 minutes of the test, or after attendance is taken if it takes longer than 30 minutes to complete. The following policies apply to students that arrive late to a test:

- Students who arrive late to the test but during the first 30 minutes of the test will be permitted to write the test in the remaining time (no extra time is given).
- If taking attendance extends beyond the first 30 minutes, students who arrive before attendance is completed will be permitted to write the test in the remaining time (no extra time is given).
- Students who arrive after the first 30 minutes of the test (or after attendance is completed) will not be permitted to write the test if one or more students had already left the test location after completing their test. However, students may request an accommodation by contacting the course instructor by email within 24 hours of the test.

### **Course Policies Regarding Missing a Term Test**

The four term tests are an important evaluation component of this course. It is the responsibility of every student to be aware of their dates, start times, and locations. Information regarding these will be posted in the course Moodle website in advance of each test.

- **If you miss an test**, notify the course instructor by email within 24 hours of the test. Documentation that supports your reason for missing the test is due within one week of the test or a deadline date set by the course director. Failure to fulfill these requirements may result in an automatic denial of the request for an accommodation.

**NOTE:** The course director will provide information about where and where to submit the supporting documentation.

**NOTE:** Submitting falsified or altered documentation in support of a missed test is a violation of Academic Integrity which will lead to disciplinary actions under York University’s Senate Policy on Academic Honesty. For more information and details, see section 2.1.8 of York University’s Senate Policy on Academic Honesty relating to the falsification of medical documentation at the following link: <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>

- **After reviewing the documentation and reason for missing a test**, the course instructor will decide whether or not to grant your request for an accommodation.
- **If a request for an accommodation is granted**, the following accommodations will be applied:
  - **Missing Test 1, 2, or 3:** The weight of the missed test will be spread across the 3 written tests. No opportunities to make up any of these missed tests will be offered.
  - **Missing Test 4:** A make up test will be provided. If you miss the make up test you will need to petition to write the test.

**NOTE:** Accommodations are not automatic. Only one request for an accommodation will be granted. In the case of an exceptional circumstance, contact the course instructor.

- **In the case that a test was missed due to a medical reason**, submit the original, signed, dated, and stamped York Attending Physician's Statement. Photocopies or electronic copies will not be accepted. The Attending Physician's Statement must be dated within 48 hours of the test date.

**NOTE:** The York Attending Physician's Statement must be the most current version that is available from the Registrar's Office. The version date is indicated in the left side of the document's footnote. Older versions of the York Attending Physician's Statement will not be accepted. If you're not sure which is the most current version, contact the course instructor.

**NOTE:** Other doctor notes or histories of illness will not be accepted. In the case of an exceptional circumstance, contact the course instructor.

- **In the case that a test was missed due to a non-medical reason**, appropriate documentation that supports your absence from the test is required. Contact the course instructor if you're not sure which documentation to provide.

**NOTE:** Being on vacation (including family vacations), other course conflicts, or work conflicts are not valid reasons that qualify for accommodation.

### **Course Policies Regarding Grades and "Extra Credit" Assignments or Artificial Grade Increases**

The final grade for this course is based strictly on the work done and the actual grades obtained for that work. To be fair and consistent to the entire class, individual grades are not negotiable and "extra credit" assignments are not provided at any point during or after the course.

Please contact the instructor about a grade only if there is a clear error (calculation, clerical, etc.) within two weeks of the grade being made available to you.

**NOTE:** The assessment structure that will be applied to all the students in this course is specified in this Course Outline. In this way, right from the start of the course, students know what to expect with respect to assessment and everyone knows (1) where they stand, and (2) what they need to accomplish to be successful from the outset. In short, students are responsible for their performance in the course.

Tests are not returned, but students may review their tests. Requests to view tests should be emailed to the course marker (email address to be announced).

### **Special Circumstances**

Students who feel that there are extenuating circumstances which may interfere with the successful completion of their exams or other course requirements are encouraged to discuss the matter with the course instructor as soon as possible.

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods should discuss this with the course instructor early in the term so that appropriate arrangements can be made.

## **Course Policies Regarding Laboratories**

The laboratory portion of NATS1690 is an independent mini-course and separate from the lecture section of the course. The lab exercises are designed to illustrate several basic principles that govern life and evolution. The labs do not coincide with lecture material and most topics covered in the laboratories will not be covered in lectures, and vice versa.

- **Lab Schedules**

The laboratories are an integral part of the course evaluation and attendance is compulsory. It is every student's responsibility to attend the lab meetings that are scheduled for the specific lab section in which they are registered. A detailed lab schedule listing the dates and times of all lab sessions will be posted to the course Moodle website. A copy of the schedule also will be posted outside the lab room (128 Lumbers Building).

**Students arriving 15 minutes after the lab begins will not be admitted.**

**NOTE:** Date confusion is not an appropriate reason for missing a lab session.

- **Pre-Lab Assignments**

Completed before lab class. Must be submitted before you will be able to begin the lab exercise. A pre-lab assignment is due at the first lab.

- **In-Lab Assignments**

Assignments will be completed during each lab session and submitted at the end of the lab period. For assignments to be accepted and graded, students must (1) be present for the duration of the lab session and (2) complete all lab work. All submitted work must be independently done.

**NOTE:** Although you will be working collaboratively on assignments, all work you submit must be independently done.

- **Switching Lab Sections**

You must attend the laboratory section in which you are enrolled in. Students showing up to a lab they are not registered in will not be admitted.

Switching into a different lab section is severely limited regardless of other timetable constraints you may have. In the event that you have a documented scheduling conflict and provided there is space, the Laboratory Coordinator may switch you to a different lab section.

Email only legitimate requests to the Laboratory Coordinator (email to be announced). Only the Laboratory Coordinator will implement permanent lab switches.

**NOTE:** Due to fire and safety regulations, a maximum of 24 students are permitted in the lab room. Permanent lab switches are permitted only into sections with less than 24 students.

- **Lab Absences**

**If you are unable to attend a lab session** due to illness or a non-medical emergency, email the Laboratory Coordinator (not your lab TA instructor) within 24 hours of missing your regularly scheduled lab session. You will be asked to submit appropriate documentation to the Laboratory Coordinator. The required documentation is the same as that required for missed tests. If your documentation and reason for missing the labs are approved, you will receive written permission, from the Laboratory Coordinator, to attend a make-up lab session.

**Scheduling a make-up lab is time sensitive** and it is, therefore, imperative that you initiate your request for an accommodation as soon as possible. Once a particular lab cycle is completed it will not be possible to attend a make-up lab.

**Make-up labs will only be scheduled by the Laboratory Coordinator.** Lab TAs are not authorized to schedule accommodations for missed labs. Lab TAs will not allow students without written permission from the Laboratory Coordinator to attend a make-up lab during their lab session.

**NOTE:** Permission to attend a make-up lab will be granted only once per student in this course.

- A second missed lab, due to any reason, will count as the lowest lab grade that will be dropped (and quiz grade, if applicable). You do not need to contact the lab coordinator or to submit documentation in this case.
- A third missed lab (or more) will not be accommodated and a grade of zero will be assigned for the missed lab(s).
- In the case of an exceptional circumstance, contact the course instructor.

- **Lab Safety**

1. No food or drink is permitted in the laboratory at any time.
2. Instructions for handling and disposal of potentially hazardous materials will be provided.
3. A laboratory coat is not required. Protective gear will be provided when required.
4. Open-toed shoes are not permitted in the laboratory.
5. Avoid wearing contact lenses in the laboratory.
6. Every student is responsible for cleaning their work area at the end of each lab session.

## Copyright and Intellectual Property

Access to and use of the course materials is restricted to students enrolled in the NATS1690 course at York University.

All materials and images for this course are provided with the permission of the rights holder, under the terms of a licence or other agreement, or under the application of fair dealing or other statutory exceptions of the Copyright Act of Canada. Copyright and all rights are maintained by the author(s) or by other copyright holder(s).

To protect copyrighted material & intellectual property that is not theirs, students are NOT permitted to:

- Copy, distribute, upload, or post course materials to any website, including commercial third-party websites. To do so is illegal and a violation of copyright law, and may lead to disciplinary actions, including being sued by the owners of copyrighted material and intellectual property.
- Photograph slides during lectures.
- Record or film lectures for non-personal use.

**NOTE:** Course materials consist of all course documents, including lecture notes, PowerPoint presentations, lecture recordings, images and videos, test reviews, tests, quiz questions and answers, assignments - and all other course documents, such as course syllabi, lecture and lab schedules, course grades, etc.

**NOTE:** Unless otherwise stated, instructors own the intellectual property to the teaching material they create. Students wishing to reuse any course content must request permission from the instructor.



### **Important Sessional Dates**

Includes sessional start and end dates, drop deadlines, and withdrawal dates. See the Office of the Registrar website at <http://www.registrar.yorku.ca/enrol/dates/>

### **Academic Honesty and Integrity**

Academic honesty requires that persons do not falsely claim credit for the ideas, writing or other intellectual property of others, either by presenting such works as their own or through impersonation.

Similarly, academic honesty requires that persons do not cheat (attempt to gain an improper advantage in an academic evaluation), nor attempt or actually alter, suppress, falsify or fabricate any research data or results, official academic record, application or document.

Finally, academic honesty requires that persons do not aid or abet others to commit an offence of academic dishonesty, including intentional acts to disrupt academic activities.

**Suspected breaches of academic honesty will be investigated** and charges shall be laid if reasonable and probable grounds exist.

### **Academic Honesty and electronic devices during assessments (e.g. exams)**

Internet capable and personal storage devices of all kinds must be turned off, including vibrate. These and any other unauthorized material must be placed under the student's chair and should not be accessed at any point during the exam. Failure to comply with directive may be considered a break of academic honesty. See <http://registrar.yorku.ca/exams/tipsheet>

Please familiarize yourself with the full Senate Policy on Academic Honesty, found at <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>

Please also familiarize yourself with the SPARK Academic Honesty tutorial found at <https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>

### **Academic Accommodation for Students with Disabilities**

York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs. The nature and extent of accommodations shall be consistent with and supportive of the integrity of the curriculum and of the academic standards of programs or courses.

Please familiarize yourself with the full Senate Policy on Academic Accommodations for Students with Disabilities, found at <http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/>

**NOTE:** Students should submit accommodation letters from Student Accessibility Services (SAS) to the course instructor within the first two weeks of the course or as soon as issued.

- Student Accessibility Services - <http://accessibility.students.yorku.ca/>
- York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

**NOTE:** A student registered with SAS, and choosing to write with Alternate Exams, is responsible for making the appropriate writing arrangements within the timeframes outlined by Alternate Exams.

- Alternate Exams - <http://altexams.students.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. <https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs>

**NOTE:** Students who will have an academic conflict as a result of a religious observance, at any point in the term, should make the instructor aware of such at least three weeks prior to the conflict.

For conflicts occurring during an official examination period, please complete the Examination Accommodation Form available at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) and submit to your instructor at least three weeks prior to the final exam.

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom 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.

A statement of the policy and procedures regarding disruptive and/or harassing behaviour by students in academic situations is available on the website of the University Secretariat (<http://secretariat.info.yorku.ca/>).

## **Division of Natural Science Resources**

### **NATS-AID**

Free peer tutoring for students enrolled in Natural Science Courses.

See <http://natsci.info.yorku.ca/nats-aid/>

### **M-AID in NATS (Math Aid)**

Free math help for students enrolled in Natural Science Courses (TA tutors)

See <http://natsci.info.yorku.ca/m-aid-in-nats/>

## **Other Resources**

### **Learning Commons**

The Learning Commons brings together key supports for your learning: writing, research, learning skills and career services. <http://www.library.yorku.ca/cms/learning-commons/>

### **goSAFE**

goSAFE is a complimentary service provided to the York Community. At the Keele campus, goSAFE has two routes: North Route & South Route which will safely transport community members by vehicle from one specified hub to another on campus. goSAFE operates seven days a week, all year round, including University closures (with the exception at Glendon during the Christmas holiday closure).

Call the goSAFE office at 416-736-5454 or extension 55454 during hours of operation. Please give your name, location and destination. <http://www.yorku.ca/goSAFE/>

### **Mental Health and Wellness at York University**

Outlines a variety of resources available to support mental health and wellness

<http://mhw.info.yorku.ca/resources/resources-at-york/students/>

### **Good2Talk**

Post-Secondary Student 24 hour Helpline, <https://good2talk.ca/> 1-866-925-5454