Welcome to Biology 1010 6.0! Biological Science is an introductory course, introducing major concepts and ideas in the study of life. It is a prerequisite for nearly all other courses in Biology, and is required for all Biology and Biochemistry majors. We usually see many other majors in BIOL 1010 (e.g., other sciences, Health, Arts, Environmental Studies and Fine Arts), so we have a diverse group of students.

In this course, you will be introduced to biological terminology and major concepts that underlie this field. While the scope of material in this course is very broad, students are encouraged to consider common threads and themes that extend across the various topics. Biology and Biochemistry majors will develop a foundation for further courses/work in biology and related areas; all students (including non-majors) will develop familiarity with this field and gain skills that can be applied in other courses and settings. This course is intended to help develop scientific literacy and critical thinking skills required of citizens in modern society.

Introductory survey courses often seem to be composed of a huge set of known, static facts. In fact, the science of Biology (and other areas) is dynamic, questioning and continually changing over time. In science, we are constantly challenging existing hypotheses and models through experimentation as new observations are made. Thus, you should feel comfortable asking questions in class and in the laboratory. We may not always be able to answer your questions, but we can usually help you find out more. Asking questions is an important skill in science (and it’s always good to practise!).

The laboratory is a key part of this course, as experimentation, observations and communication of biological phenomena are important aspects of “doing” (and understanding) science. Again, the skills gained in the laboratory component will be valuable in future laboratory courses, and often can be applied in other academic or workplace situations.

**Course learning objectives:**
Upon successful completion of BIOL 1010 6.0, students will be able to:
- Explain selection and its role in evolution.
- Explain, in basic terms, how evolution shapes life on Earth.
- Describe the cell theory in biology, and relate this theory to other biological concepts.
- Use biological terminology with correct scientific meaning and appropriate context.
- Assess information (and data) in the media using scientific reasoning.
- Use the process of scientific inquiry to make effective decisions/arguments about real-world issues that have a biological component.
- Provide examples of how scientific knowledge is iterative and cumulative.
- Observe our planet from a scientifically informed perspective.

Additional learning objectives will be provided for individual topics.

**Laboratory learning objectives:**
Upon successful completion of the laboratory component of BIOL 1010 6.0, students will be able to:
- Carry out basic biological laboratory activities with safety and reliability.
- Develop hypotheses and make predictions in a variety of simple biological laboratory experiments (real or simulated).
- Make descriptive observations of biological specimens (via microscope and/or eye).
- Prepare clear, appropriately labelled and formatted figures and tables for presentation of results from biology experiments (real or simulated).
- Perform basic literature searches and find library resources relating to biological topics.
- Organize and display multiple reference courses in a requested format (relating to an acceptable biological journal).
- Prepare a basic biology laboratory report in the appropriate format, (including several of the items above) citing and listing references correctly.
- Describe what constitutes plagiarism.
- Prepare written work that paraphrases (and cites) reference sources appropriately (and otherwise abide by principles of academic integrity).
- Effectively and collegially work with others in the biology laboratory and class setting.
Calendar description:
A course for biology students examining unifying concepts and fundamental principles of biology. The course offers an introduction to cell and molecular biology, genetics, ecology and evolution. The laboratory exercises are an integral component, therefore, students must pass the laboratory section in order to pass the course.
Prerequisites: OAC Biology or 12U Biology or SC/Biol 1500 3.00; OAC chemistry or 12U chemistry or SC/Chem 1500 4.00.
Course credit exclusions: SC/BIOl 1410 6.00, AK/NATS 1910 6.00.

Term:
BIOL 1010 is a full Year (Fall and Winter) course, with classes beginning:
Mon., Sept. 13 [Sections A and B]
Thurs., Sept. 16 [Section C]
Mandatory tutorial: Section A: Sept. 20, Sections B & C: Sept. 16.
There will be no laboratories in the first week of class. See lab manual schedule.

Course directors/instructors/coordinator:
Dr. Tanya Noel [Course director, instructor in Sec B, A] – tnoel@yorku.ca
Dr. Tamara Kelly [Instructor in Sec A, B] – tjkelly@yorku.ca
Dr. Michael Gadsden [Instructor in Sec C] – mgadsden@yorku.ca
Dr. Mark Vicari [Instructor in Sec C] – mvicari@yorku.ca
Dr. Jennifer Rose [Lab director] – jbrose@yorku.ca
Keir Menzies [TA lab coordinator] - biol1010@yorku.ca

Course components:
Class:
Section A: Mondays, Wednesdays and Fridays 1:30–2:30 PM, CLH I
Section B: Mondays, Wednesdays and Fridays 1:30–2:30 PM, CSE A
Section C: Thursdays 7-10 PM, CSE C

There will be some days where no classes are held in Sections A and B:
Section A: Oct. 8, Oct. 27, Feb. 16, Feb. 18
Section B: Oct. 8, Oct. 29, Feb. 14, Feb. 18
(These are subject to change; additional days may be added to the list.)

In Section C, some classes may not run the full 3 hours.

Laboratory: 3 hours in alternate weeks (see timetable and lab manual for full details/schedule).
The lab exercises and assignments provide an opportunity for students to:
• explore aspects of biology.
• think like scientists - ask questions, make predictions, test hypotheses, solve problems, evaluate theories and use other aspects of inquiry.
• learn how to communicate scientific information in written form.
• find and understand some of the scientific literature.
• reinforce some key biological concepts.
• become familiar with practical aspects of lab work (using microscope, working safely in a lab, etc).
• work in smaller groups, where students can get to know one another, and their TA.

TA lab coordinator: Keir Menzies (biol1010@yorku.ca). Students should contact the TA lab coordinator regarding missed labs. See lab manual for whom to contact in other situations.
Tutorial:
Section A: Mondays 2:30 – 3:30 PM, CLH I
Section B: Thursdays 10:30 - 11:30 AM, CSE A
Section C: Thursdays 5:30 - 6:30 PM, CSE C
(Tutorials will not occur every week, will be announced as needed. Mandatory library
tutorial: Section A: Sept. 20, Sections B & C: Sept. 16.)

Clickers:
TurningPoint clickers are required for BIOL 1010 classes. Clicker questions/quizzes will
contribute to the "Clicker questions/quizzes" portion of the course. If you purchase the textbook
bundle from the Bookstore, a clicker is included. If you do not purchase the textbook bundle,
a clicker can be bought through Computing Services. More details will be provided in class and
Moodle. We will not use clickers in the first week of class. Clickers must be registered by Sept.
24.

Website: The BIOL 1010 Moodle site will include announcements, course materials, online quizzes,
resources and a discussion forum. http://moodle.yorku.ca or https://moodle10.yorku.ca/

Text/Readings: "Biology: Exploring the Diversity of Life" by Russell et al. 1st Canadian ed. Nelson
Publishing.

Other books:
"Writing Papers in the Biological Sciences" by McMillan. 4th Ed. W.H. Freeman Publishing
(required for the laboratory);
"A Problem-Based Guide to Basic Genetics" by Cronkite is bundled with the
textbook, and is useful in studying chromosomes, meiosis and genetics
concepts/problems.

There will be copies of the texts on reserve (2 h) in the Steacie Library. Students are expected to
read relevant sections of the text prior to class. (There will be some short quizzes on readings,
announced ahead of time.) Other readings may be assigned during the course.

Note: Other introductory Biology textbooks and writing guides may be used, but students are
responsible for using the index/table of contents to determine relevant portions of other
books.

Evaluation: [TENTATIVE – will be finalized by Sept. 25]

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<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Fall midterm</td>
<td>14%</td>
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<td>December exam</td>
<td>21%</td>
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<tr>
<td>Winter midterm</td>
<td>15%</td>
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<td>April exam</td>
<td>23%</td>
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<tr>
<td>Laboratory</td>
<td>22%</td>
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<tr>
<td>Clicker Questions/Quizzes</td>
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Fall and Winter midterms will be during class time, and are 45 minutes. December and April exams will
be include cumulative questions and are 90 minutes; dates/times/rooms for exams are scheduled and
published by the Registrar’s Office (RO).

* Many of the items used in this category will include points for participation/completion. These can
include clicker questions, Moodle quizzes/assignments or in-class exercises. The lowest 20% of clicker
questions/quizzes (including zeroes) will be dropped from the student’s score. This is to account for a
missed class (e.g., due to illness or other reasons), forgotten clickers, etc.

Reminders: Both lecture and lab components must be passed independently to pass the course. The Y
term drop date is Feb. 11, 2010.
Test/exam schedule

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<th>Section A</th>
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<td>December exam</td>
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<td>Dec. exam period (to be determined by RO)</td>
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<td>April exam</td>
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<td>Final exam period in April (to be determined by RO)</td>
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Accommodation Statement:
Students who feel that there are extenuating circumstances that may interfere with their ability to successfully complete the course requirements are encouraged to discuss the matter with the Course Director as soon as possible. Please note: "Senate policy states that students are expected to monitor their progress in courses, taking into account their personal and academic circumstances, and to make the necessary adjustments to their workload to meet the requirements and deadlines." (from Senate Policy of Students' Responsibilities in the Petition/Appeal Processes: http://www.yorku.ca/univsec/senate/committees/sac/sturesp.htm)

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods are encouraged to consult with the Office for Persons with Disabilities (OPD) and ensure that requests for appropriate accommodations are arranged with the Course Director early in the term.

Academic integrity:
Students are expected to be familiar with and follow York University's policies regarding academic integrity. Please consult the lab manual and website below for more details: http://www.yorku.ca/academicintegrity/students/index.htm

Student information sheet – please see:

Planned course topics:
Although we’ve divided up the planned topics between two instructors, there are several underlying themes and threads that extend across all of the portions of the course. The hierarchical organization (levels within levels) of life recurs across different topics in biology. The change in genetic characteristics of individuals within populations over time (evolution) accounts for the incredible diversity of organisms, while at the same time explaining the unity commonly observed in organisms.
Topics by category:

**Introduction to biology** – Dr. Noel, Dr. Kelly, Dr. Gadsden
- Light and life
- Introduction to selection and evolution

**Cell and molecular biology, genetics** – Dr. Noel, Dr. Gadsden
- Cells – an introduction to metabolism, information and compartmentalization
- Membranes and membrane transport
- Energy and enzymes
- Metabolism, selected metabolic pathways (respiration, photosynthesis, folate)
- Cancer, cellular signalling and cell cycle regulation
- Continuity - cell division, DNA replication
- Gene expression, continuity vs. variety – reproduction, chromosomes, recombination and meiosis
- Genetics: genes, phenotypes, and patterns of inheritance

**Evolution and ecology** – Dr. Kelly, Dr. Vicari
- Selection, biodiversity and biosphere
- Descent with modification – the ideas and the evidence
- Evolution of populations – it's more than just natural selection
- Speciation – the link between micro- and macro-evolution.
- Phylogenies – hypothesis of evolutionary relationships
- Diversity of life – relating evolution to ecology
- Population Ecology – applying natural selection to life histories
- Community ecology/aquatic and terrestrial ecosystems (are we really the top of the food chain?)
- Conservation biology

*** Topics and order of topics are subject to change. Some topics may not be given separate treatments, but will be integrated. ***

**Please note:** BIOL 1010 sections (i.e., sections A, B, and C) are NOT interchangeable; to best prepare for the assessments, students must attend the lectures and tutorials for the section in which they have registered.

**Resources:**
There are many offices and services that provide valuable services/information to our students. We’ve included information in the Appendices of your lab manual, and this will also be posted online in Moodle.

**Policies:**
1. If you miss a test with a legitimate documented reason, permission may be granted to take a makeup test (if applicable). Only a "York Attending Physician's Statement Form" (can be downloaded as part of the Petitions Package) OR a similarly detailed doctor's note (i.e. not a form just stating that the student visited the clinic) will be accepted for medical excuses. The documentation should cover the date of the missed test. All documentation supporting your excuse for missing a test must be received at the Biology Undergraduate Office within a week of the missed test (or as soon as the student is able to return to school if you are sick for more than a week), but students should contact us as early as possible after a missed test. Makeup tests may differ in format from the original test (i.e., include more short/long answer questions).

2. The format of tests and exams will be primarily multiple choice questions. Questions with written answers may also be used. (If we don’t have written answers, please disregard the rest of this point.) If you believe that a written answer on a test was marked incorrectly, you must submit your (written) rationale and paper for remarking within 1 week of the test being made available to you. Only those answers written in ink will be eligible for remarking. Note: Remarking can result in the mark being raised, confirmed or lowered.

3. In order to be fair and consistent with regards to the entire class, individual grades are not negotiable. We cannot provide “extra credit” assignments. Marks for assignments and tests will not be “rounded”. **Contact the course director about marks ONLY if there is a clear error in your mark** (calculation, clerical, etc.) as soon as possible at tnoel@yorku.ca. It is highly unlikely that you will receive a response regarding any other mark-related queries.

4. **DEFERRED STANDING:** Students who do not write the final exam, but have completed all midterms and lab submissions/ reports and assignments by the scheduled dates, must submit a Deferred Standing Agreement (and relevant documentation) to the course director requesting permission to write a deferred exam (i.e., sign the
Deferred Standing Agreement form). It is Senate Policy that “Normal requests for deferred standing must be communicated within one week following a missed examination, or on the last day to submit course work”. Please check out the Registrar’s Office Deferred Standing FAQs (http://www.registrar.yorku.ca/services/ds_faq.htm) for more details. Students who have missed one or more midterms (or other major components) will likely be required to petition to write a deferred exam.

5. EMAIL POLICY: Students should use their yorku.ca email address for correspondence relating to the course. (Email from other addresses, such as hotmail or yahoo, are likely to be filtered as spam/junk.) The subject line should include “BIOL 1010”, your section (A/B/C) and a brief mention of the topic of the email. (E.g., Subject: “BIOL 1010 Section A: Confused about photoreceptors”, or “BIOL 1010 B – Ch15 review question 7”.) The body of the email should have a clearly written message, and must include your name and student number. It is recommended that students check the Moodle discussion forums to see if a question has already been answered before sending email.

6. FORUM CODE OF CONDUCT. Students are encouraged to participate in the online Moodle forums to discuss course concepts, organize study groups, and ask questions relating to Biology. The discussion on the forums has typically been polite and respectful, and we hope this will continue. Students are expected to follow the code of conduct in use of the Moodle forums:
   i. Check to see if your question has already been posted. (You can search the forums - you don't have to read each post!) If your question hasn't already been asked, please post in the most appropriate area. (E.g., if your question is about a lab submission, your post should be in the "Laboratory" forum.)
   ii. Use a clear, informative subject line. Try to be as specific as possible.
   iii. Post comments appropriate to the particular discussion. Off-topic posts may be moved or deleted.
   iv. Be respectful. Posts containing personal insults/attacks/intimidation/profanity will be deleted. (It is also worth remembering that your instructors read forum posts!)
   v. Post only material relevant to BIOL 1010/Biology. Other posts are likely to be deleted.
   vi. While it is appropriate to engage in debate/discourse on biological topics, such discussions should be respectful and evidence-based. Evidence should be from trusted sources – consult with the library or your instructor if you are not sure! (See: http://www.yorku.ca/webclass/module4a.html)
   vii. Any posts which appear to violate our code of conduct may be edited, moved to a hidden forum or deleted at the discretion of instructors/moderators. If posts give indications of violations of academic honesty or the York University student code of conduct, further action will be taken.

Disclaimer: While Moodle moderators / instructors will attempt to remove (or edit) objectionable/inappropriate material as quickly as possible, it is not always possible to review every post. All posts made on the forums express the views and opinions of the author and not the moderators / instructors (except for posts by these people) and they cannot be held liable.

7. Students must follow laboratory policies outlined in the lab manual. Be aware that students will NOT be allowed entry into the labs if:
   - bringing food/drink into the laboratory room.
   - not wearing appropriate clothing. (Sandals and other open-toed shoes are NOT allowed in the laboratory.)

Additional policies/rules specific to the laboratory are available in the lab manual and on the course website. Students are expected to read these policies, and sign the laboratory conduct agreement before the first laboratory session.