SC/BIOL 1000 3.0 Biology I – Cells, Molecular Biology and Genetics

Fall 2014 Course Outline

Welcome to BIOL 1000 3.0! Biology I is the first half of introductory biology, and is a prerequisite for nearly all other courses in Biology. Grade 12 Biology (or BIOL 1500 3.0) and Grade 12 Chemistry (or CHEM 1500 3.00) are prerequisites, and we will assume a basic understanding of that material.

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, Environmental Biology and Biochemistry majors will develop a foundation for further study in biology and related areas; all students 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 the 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 reality, Biology, like all sciences, is dynamic, questioning and continually changing. In science, we are constantly challenging existing hypotheses and models through experimentation as new information is gathered. Asking questions is an important skill in science so 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. We will also encourage you to seek your own answers – another important life skill.

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. 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.

Lectures Start the week of September 8, 2014.

Course learning objectives *(Topic specific learning objectives available on the Moodle site)*

Upon successful completion of BIOL 1000 3.0, students will be able to:

- Use the process of scientific inquiry to make effective decisions/arguments about real-world biological issues
- Use biological terminology with correct scientific meaning and appropriate context.
- Explain how light impacts life in different ways.
- Explain selection and its role in evolution.
- Describe the cell theory in biology, and relate this theory to other biological concepts.
- Describe the importance of membranes, and different mechanisms of membrane transport.
- Relate biological structure and function at the level of the cell, organ, and organism.
- Identify key similarities and differences between prokaryotic and eukaryotic cells.
- Compare and contrast major biochemicals and biochemical pathways (including cellular respiration, photosynthesis, cell signaling).
- Compare and contrast different mechanisms regulating gene expression.
- Describe processes of mitosis and how the cell cycle works in eukaryotic cells.
- Describe how chromosome movement during meiosis reflects Mendel's principles of independent assortment and segregation. Solve Mendelian genetics problems involving one or two genes.
- Describe the relationship between genes, alleles, proteins and phenotype.
- Describe the mechanisms that can lead to genetic diversity, identify patterns of inheritance relating to sex linkage, gene linkage, codominance and incomplete dominance.
- Describe basic techniques used in recombinant DNA technology and their significance.

Laboratory learning objectives

Upon successful completion of the laboratory component of BIOL 1000 3.0, students will be able to:

- Carry out basic biological laboratory activities with safety and reliability.
- Develop hypotheses and make predictions for simple biological laboratory experiments
- Design simple experiments and successfully trouble shoot where necessary
- Make descriptive observations and critically analyse data
- Prepare clear, appropriately labeled & formatted figures and tables for presentation of biological results.
- Prepare components of a basic biology laboratory report
- 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.

Note: All polices herein are binding and apply to all students registered in the course.

Calendar description

An introduction to major unifying concepts and fundamental principles of biology, including evolution and cell theory. Topics include cells, biological energetics, metabolism, cell division and genetics. The laboratory and lecture components must be passed independently to pass the course. Three lecture hours per week; three laboratory hours in alternate weeks. One term. Three credits. Prerequisite: 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 1010 6.00; SC/BIOL 1410 6.00.

Required Reading Material

- **"York University Custom Edition of Biology: Exploring the Diversity of Life." Nelson Publishing**
  - This custom textbook includes 1) Volume 1 - Biology: Exploring the Diversity of Life. 2nd Canadian ed. Nelson Publishing. 2) A chapter from Russell *et al*. 2013 on Bacteria and Archaea. 3) A chapter on cell communication from the 1st Canadian ed. of this text. 4) Aplia access card.
    - **Aplia is the online companion to this text and is required for this course**. Graded quizzes associated with the lecture activity grade will be conducted using this program. You also have access to all three volumes (the whole text) of Russell *et al*. 2013 and other useful learning resources (*e.g.* animations).
  - **Available in the bookstore $67.95**
  - Note 1: You may use Russell *et al*. 2013. Volume 1 - Biology: Exploring the Diversity of Life. 2nd Canadian ed. Nelson Publishing, instead of the custom edition, but you will still be responsible for readings that are not included in this publication. In addition, Aplia will be used for graded quizzes in this course and thus will need to be purchased separately.
  - Note 2: The 1st edition of Russell *et al*. Volume 1 - Biology: Exploring the Diversity of Life may also be used, but the custom edition will be followed during the course. The 1st edition covers much the same material, but it is not identical and some parts are organized differently by chapter. If you prefer to use the first edition that is fine, but it will be up to you to find the relevant sections of the text to do readings and reading quizzes by making use of the index. The instructors will not be able to guarantee that answers for each reading quiz question will be covered in the 1st edition, though certainly most will be. You will also need to purchase Aplia separately in order to complete the reading quizzes.

- **McMillan (2012) "Writing Papers in the Biological Sciences" 5th ed W.H. Freeman.**
  - This textbook is also required for BIOL 1001.
  - **Available in the bookstore $35**

- **BIOL 1000 Fall 2014 Laboratory Manual**
  - **Only available in the bookstore $11.95**

- See short-term reserves (2h) in the Steacie Library for reading material relevant to this course.
- Other readings may be assigned during the course and will be made available to students.

Required: Clickers (personal response system)

- Turning Point Clickers will be used in this course. Bring your clicker to every lecture.
- Each student must purchase his or her own clicker. Using a clicker not registered to you (or answering clicker questions for a friend) is considered a breach of Academic Honesty.

- **Turning Point Clickers are purchased through York University Computing Services.**
  - New clickers are $42 (charged to your student account) and ordered online with pickup at the Scott Library
  - Course Instructors and TAs are not involved with the sale or registration of clickers
  - To purchase
    - Go to www.yorku.ca/prs/students/
    - Click on "Purchasing Your Clicker"
- **Register your clicker as soon as your receive it.** Clickers are typically used within the first two weeks of class.
  - Go to www.yorku.ca/prs/students/
  - Click on "Registering Your Clicker"
  - Follow the instructions.
- See "General Clicker Information" document on course Moodle Site for additional information.

Required: Laboratory coat and safety goggles

- Students are required to bring a laboratory coat and safety goggles to each wet lab (these are labs that occur in LSB 215, 217 and 219). Students lacking these items will not be permitted to remain in the lab and no makeup will be granted.
- Laboratory coats and safety goggles are available in the bookstore.

Course Moodle Sites http://moodle.yorku.ca

- **Lecture Moodle Site (each lecture section has its own site)**
  - The BIOL 1000 Moodle site will include announcements, course materials (*e.g.* lecture schedule and reading list, lecture slides), some assignments, and a discussion forum.
  - This site will be used for posting course information including lecture slides, exam results and supplementary information.
  - Visit regularly
- **Laboratory Moodle Site (listed as "SC/BIOL1000 A, B, C & D – Biology I – Cells, Molecular Biology and Genetics (Fall 2014-2015)"** on your home Moodle page)
  - This site contains information related to the laboratory component including additional laboratory material and laboratory quizzes.
  - Visit regularly
- **Moodle discussion forums**
  - Be sure to read the other threads before you post a question to see if your question has already been answered.
  - When posting, be clear specific and professional.
  - Discussions are monitored. Messages containing personal attacks, inappropriate language, or other disrespectful content will be removed. Irrelevant material will also be removed. Follow the York University Student Code of Conduct http://www.yorku.ca/oscr/codeofrr.html
  - If you notice any inappropriate threads please email b1000lec@yorku.ca

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.

Recording Lectures

- Photographs or video recordings of any portion of the lectures (including slides) are **prohibited**. Images and material presented are subject to Canadian copyright law.
- Audio recordings are permitted provided they are used **only as a personal study aid, and are not sold, passed on to others or posted online**. Remember the lectures are the intellectual property of the professor and cannot be distributed without permission. Lectures can only be recorded from your seat. No recording devices are permitted at the front of the room, including front table(s), the lectern and computer area.

Course Contact Information

Lecture-related email (all sections): b1000lec@yorku.ca
Laboratory-related email (all sections): b1000lab@yorku.ca

First Year Biology Office: 102 Life Sciences Building (LSB)

Course Director: Dr. Julie Clark
Course Instructors: Dr. Paula Wilson (Section A)
Dr. Julie Clark (Section B)
Dr. Nicole Nivillac (Section C, D)

Laboratory Director: Dr. Julie Clark
Laboratory Coordinator: TBA

E-mail Policies and etiquette

We will try to respond to email within two working days, but this is not always possible. We may also answer your question in the next class meeting if appropriate. Questions and answers that we deem of interest to the entire class will be posted on the appropriate discussion board or sent via course announcements if urgent.

- Emails that do not meet the requirements below will not be answered:
    - Use your @yorku.ca email address when emailing instructors and others within the university. Email from other sources may be filtered out and not reach the intended recipient.
    - Subject Line
        - Include the course code, **course section** and brief indication of topic.
            - Lecture email example: BIOL1000**B** – question regarding plasma membrane
            - Lab email example: BIOL1000**D** – missed lab 2 because of illness.
        - The course section is critical to ensure the appropriate instructor receives your message.
    - **Include your name and student number at the end of each email**. We work with hundreds of students and the only way we can access your course information is via your student number.
- Remember, you are in a professional environment and thus all your written correspondence, including emails, should be professional. This means full sentences, proper grammar, no text message lingo.
- Before emailing the instructor, consider the nature of your question and whether another resource should be consulted first. For example, lab-related queries should be directed to the lab coordinator.

Course components

**** Lecture and labs must be passed independently to pass the course****

- **Lectures**
    - There are four course sections (A, B, C, D) running in Fall 2014. For lecture times/location, consult the University schedule.
    - Note that you must attend the lectures for your own course section – while basic concepts are the same across all sections, details, order and emphasis may vary.
    - **Lectures begin the week of September 8, 2014**

- **Laboratory**
    - **Laboratories Start the week of**
        - **September 15, 2014 for Groups 1, 2 and 3**
        - **September 22, 2014 for Groups 4, 5 and 6**
    - ***** See lab manual for schedule details and to determine your group *****
    - You must attend your registered section. Students not on the laboratory class list are not permitted in the lab.
    - Permanent lab switches can only be made through the registrar enrollment system (you can only register in your desired section if space is available).
        - This must be done by **11:59pm on September 14, 2014**
    - Lab Policies and Safety Regulations
        - See the BIOL 1000 Lab Manual. Students are expected to read and abide by these policies.
        - Any student not following lab safety regulations will be asked to leave the laboratory or will not be permitted to enter in the first place. Makeup labs will not be granted.
    - If you are repeating BIOL 1000, you must also repeat the laboratory component. There are no lab exemptions.

Evaluation

Midterm Test 1:	15%	**Saturday October 4, 2014 1:15pm to 2:15pm**
Midterm Test 2:	23%	**Saturday November 15, 2014 1:15pm to 2:15pm**
Final exam:	35%	Exam schedule is set by the registrar and announced later in the semester
Activities*	5%	Includes clicker questions/quizzes/ other assignments
Laboratory:	22%	Mandatory, even if repeating the course. Must pass independent of lecture.

* Many of the items used in this category will include points for participation/completion. This can include clicker questions, weekly reading quizzes (completed on aplia), Moodle quizzes/assignments, and/or in-class exercises. The lowest 20% of clicker questions/ quizzes (including zeroes) will be dropped from your grade. This is to account for an occasional missed class (*e.g.,* due to illness or other reasons) or for forgotten/ malfunctioning clickers, etc.

***** Reminder: Both lecture and lab components must be passed independently to pass the course. The final drop date is November 7, 2014. *****

<u>Please note:</u> in BIOL 1000, to best prepare for the assessments, students must attend the lectures.

Course Policies

1. **Test Format**
   - The format of tests and exams will be primarily multiple choice questions. Questions with written answers may also be included. For written answers, if you believe that a written answer on a test was marked incorrectly, you must submit a written rationale that is based on academic grounds* with your test to the First Year Biology Office (LSB 102) within one week of the test being made available to you. **Only those answers written in ink will be eligible for re-grading**. *Note: Re-grading can result in the grade being raised, confirmed or lowered.*
   - See BIOL 1000 Lab Manual for reappraisal information pertaining to laboratory assignments.

**Academic grounds means you make an academic argument for why your answer is correct – statements such as "this grade does not reflect my knowledge" or "I really studied hard and I deserve a better grade" are not academic grounds.*

2. 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" or "bell-curved".** Contact the Course Director about marks only if there is a clear error in your grade (calculation, clerical, etc.) within one week of the test score being made available to you at b1000lec@yorku.ca.

3. **Missed Midterm Tests**
   - You must **email your instructor at** b1000lec@yorku.ca within two days (48 hours) of missing the test (the sooner the better).
   - Valid and appropriately detailed documentation supporting the events (typically medical or emergency related) preventing your attendance must be submitted to the First Year Biology Office (LSB 102) within seven (7) days of the missed test. Documentation should cover the date of the missed test.
     - Medical (illness) related: You must see a Physician within 24 hours of the missed test – ideally on the same day - so that the Physician can confirm you are too ill to attend the test based on medical examination. Valid documentation for medical situations consists of an "Attending Physician's Statement" (form available on the Moodle site) or letter/document of similar detail. A note that simply says you were seen in the clinic will not be accepted.
     - Death of an immediate family member: death certificate or letter from the funeral director
     - Contact your instructor (b1000lec@yorku.ca) to determine the appropriate documentation required for other circumstances.
   - If appropriate documentation is not provided within seven (7) days, a zero will be earned on the missed midterm.
   - Not all situations will be accommodated, meaning that a zero will be earned on the missed test.
     - Circumstances not accommodated include, but are not limited to, schedule confusion, sleeping in, missing the bus, personal endeavours (including a job), and busy lives.
   - Where appropriate and possible, makeup tests will be scheduled. These may differ in format from the original test (*i.e.,* include more short/long answer questions).

4. **Missed Final exam**
   - ***All students*** who miss the final examination must petition if they are seeking deferred standing. No student will be granted deferred standing by the instructor via a Deferred Standing Agreement Form (DSA). Students will have to seek deferred standing by submitting a petition to their home faculty. It will be the Petition Committee's decision whether deferred standing is granted and, if deferred standing is granted, this committee will also set the deadline for writing the deferred examination.
   - See "**Deferred Standing Guidelines for Final Exam Only**" on the course Moodle site for procedures to follow in the event that you miss the final exam.
   - The format of the make-up final exam for this course may be essay, short answer, and/or multiple choice.

5. **Moodle 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 when using 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 1000. Other posts will 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 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 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.

Accommodation Statement

Relating to medical, religious and other

- 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 Instructor 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)

- **CDS students**
  - If you are registered with CDS please submit your accommodation letter to the First Year Biology Office (LSB 102) before your first lab or as soon as you receive it. Please email b1000lec@yorku.ca to make us aware of submissions.

- **Religious observance conflicts**
  - Please inform your instructor of any religious observance conflicts occurring at any point during the semester, for which accommodation will be required (*i.e.* for a test or lab), before your first lab. Please email these dates to b1000lec@yorku.ca and submit supporting documentation to the First Year Biology Office (LSB 102).
  - Note: if you are to miss a lecture, or part of a lecture, please make arrangements for a classmate to take notes. Lecture slides will be available on Moodle.

- **Other**
  - 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 instructor early in the term.
  - 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 instructor as soon as possible (*i.e.* the first week of class).

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

Resources at York University

- There are many offices and services that provide valuable services/information to our students. Please see Appendix 4 of the BIOL 1000 Laboratory Manual or the Moodle site