

*This syllabus is a general representation of the course as previously offered and is subject to change.*

## **BIOL 111 – Introduction to Modern Biology**

General Course Syllabus (as of August 2019)

### **About the Course:**

**Course Description:** A course on the concepts fundamental to biological issues, such as the genetic basis of biological variation, evolution, infectious diseases, causes of cancer, population growth, and human effects on ecosystems. Not open to students who have credit for Biology 12 (including AP, IB).

**Course Format:** Lecture

**Credits:** 3

**Pre-requisites:** Open to students that do not have credit for Biology 12 (including AP, IB) or BIOL 112 and require BIOL 111 as a prerequisite for BIOL 112, 121, and 140.

### **Course Learning Objectives:**

By the end of this course, students should be able to:

- Understand science as an inquiry-driven, investigative process.
- Enhance scientific literacy, ability to access scientifically reliable information, and appraise biologically related news items critically.
- Construct a framework of biological knowledge that will help in understanding some of life's experiences and issues (e.g. global climate change).
- Work cooperatively in a team to discuss, debate and problem-solve in-class exercises, current issues assignments and case studies.
- Use the biological knowledge and concepts to (a) evaluate biological problems and challenges; and (b) develop a communications tool depicting any of the unifying themes of biology [capstone project].

### **Textbooks and Additional Resources:**

- **Required Text** (available at the UBC Bookstore): *Campbell Essential Biology with Physiology* 6<sup>th</sup> Ed., 2019, Eric J. Simon, Jean L. Dickey, Kelly A. Hogan and Jane B. Reece.
  - Mastering Biology access is also included with the Bookstore purchase for additional practice questions, but purchase of this publisher content does not count towards class points and is optional.
  - Students may use the older 5<sup>th</sup> edition of the textbook, but if so the instructors will not be able to provide relevant page numbers.
  - Students may also buy e-book access without the physical copy. Students are encouraged to search for the options that best fits their budget.

- **Required Materials:**
  - i-Clicker: available at the UBC Bookstore; students must register their remote on Canvas before coming to class.
  - Pencil or pen, and some 8.5 x 11" paper. Please bring these to class.
  
- **Access to Course Website:**  
All registered students will have access to course materials on canvas.ubc.ca.

## Evaluation:

The grades breakdown may vary by term. Below are examples from 2018W:

| Assessment                                      | Weight in 2018W1 | Weight in 2018W2 |
|---|------------------|------------------|
| In-class clicker questions and other activities | 10%              | 4%               |
| Homework  | 7%               | 11%              |
| Reading Quizzes                                 | 7%               | 5%               |
| Group Project                                   | 6%               | 10%              |
| Midterm 1 Exam (in-class)                       | 20%              | 15%              |
| Midterm 2 Exam (in-class)                       | 20%              | 15%              |
| Final Exam                                      | 30%              | 40%              |

### DETAILS ON ASSESSMENTS:

**Clicker Participation and Other Activities:** Class participation through the use of clickers is required. Clicker questions are marked for participation rather than correctness. Students will not get marks for missed clicker questions, but the lowest three scores may be dropped from the overall clicker grade at the instructor's discretion. Other activities may include writing prompts to be completed individually, surveys, and worksheets and other activities to be completed either in groups or individually.

**Homework:** Homework will be assigned on an approximately weekly basis. Select articles from the popular press will be used for students to answer questions pertaining to comprehension of the article, relevance to class concepts, repercussions for society or their own lives, and their opinions. Late assignments will be deducted one increment for each class period late.

**Reading quizzes:** Before each class, students are to read assigned sections of the textbook and complete a pre-reading quiz. Quizzes completed late will receive a 10% deduction in points, and an additional 10% deducted for each class day late.

**Group Project:** In small groups, students will collaborate on an assigned project on a topic of similar interest. Specifics of the group project vary and will be provided by the

instructor. Past group project examples include: developing a communications tool (e.g. digital story, skit, song, theatrical performance, poster), interviewing and writing a report on biology research labs, or identifying and classifying species from the Beaty Biodiversity Museum or Pacific Spirit Park. Late group assignments will be accepted but with a penalty of 10% per class day late.

**Exams:** All exams will be essay, short answer, or problem solving. The final will be comprehensive, and will be weighted approximately proportionately toward material not covered in the two midterms.

Students are required to write the midterms and final exam on the designated dates. Any missed midterm exam(s) must be reported with supporting documentation and upon approval, the midterm weight will be added to the final exam. Alternatively, a mark of 0% will be entered. There are no “makeup” midterm exams. Any missed final exam must be reported to Science Advising (or appropriate Faculty advising office) with supporting documentation (see UBC calendar for more policies on Final Exams). There are no provisions to alter the final exam schedule due to travel plans, etc.

### Schedule of Topics:

Below is a sample schedule from 2018W1 (subject to change):

| Week | Topics   |
|------|--|
| 1    | <ul style="list-style-type: none"> <li>• Syllabus &amp; Introduction</li> <li>• Scientific method</li> </ul>   |
| 2    | <ul style="list-style-type: none"> <li>• Scientific method (continued)</li> <li>• Characteristics of life, major themes of biology</li> <li>• Darwin’s Voyage, Evolution by natural selection</li> <li>• Evidence for evolution</li> <li>• The phylogenetic tree of life</li> </ul>                  |
| 3    | <ul style="list-style-type: none"> <li>• Other mechanisms for evolution</li> <li>• Species concepts &amp; nomenclature</li> <li>• Species and speciation</li> <li>• The phylogenetic tree of life</li> <li>• Species interactions-the ecological niche</li> <li>• Symbiosis and predation</li> </ul> |
| 4    | <ul style="list-style-type: none"> <li>• Adaptation to the environment</li> <li>• Community ecology, food webs</li> <li>• Chemistry for Biology, chemistry of water</li> <li>• Organic chemistry &amp; chirality, carbohydrates and lipids</li> </ul>  |

|    |   |
|----|---|
|    | <ul style="list-style-type: none"> <li>• Protein structure &amp; DNA</li> </ul>   |
| 5  | <ul style="list-style-type: none"> <li>• Diversity of life, prokaryotic cells &amp; microscopy</li> <li>• Eukaryotic cells</li> <li>• Endosymbiotic theory</li> <li>• Cytoskeleton</li> </ul> |
| 6  | <p><b>Midterm exam 1</b></p> <ul style="list-style-type: none"> <li>• A history of all life on earth in one lecture</li> </ul>  |
| 7  | <ul style="list-style-type: none"> <li>• Laws of Thermodynamics &amp; ATP</li> <li>• Membrane transport</li> <li>• Enzymes</li> </ul>   |
| 8  | <ul style="list-style-type: none"> <li>• Neurons</li> <li>• Neurotransmitters &amp; the synapse</li> <li>• Signal transduction</li> </ul>   |
| 9  | <ul style="list-style-type: none"> <li>• DNA structure, mitosis and cancer</li> <li>• Gaining genetic diversity-meiosis</li> <li>• Mendelian Genetics</li> </ul>                              |
| 10 | <ul style="list-style-type: none"> <li>• Mendelian Genetics (continued)</li> <li>• Central dogma</li> </ul> <p><b>Midterm exam 2</b></p>  |
| 11 | <ul style="list-style-type: none"> <li>• Viruses</li> <li>• Gene expression &amp; regulation</li> </ul>   |
| 12 | <ul style="list-style-type: none"> <li>• Biotechnology-Recombinant DNA</li> <li>• Biotechnology-DNA sequencing and PCR</li> <li>• Photosynthesis &amp; Respiration</li> </ul>                 |
| 13 | <ul style="list-style-type: none"> <li>• Ecosystem ecology</li> <li>• Geochemical Nutrient cycling</li> <li>• Climate change</li> <li>• Catch-up/exam review</li> </ul>                       |

## **University Policies:**

*UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.*

*UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.*

*UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.*

*UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.*

*Details of the policies and how to access support are available on [the UBC Senate website](#).*