BIOL F103L: Biology and Society – Online Laboratory
SYLLABUS

Course Overview
Welcome to Biology! This 1-credit lab course is designed to give the non-biologist a working knowledge of the life sciences that will be useful in making informed decisions on health and the environment. We will cover a wide variety of introductory biology concepts and conduct an independent research project. Course description: A laboratory section only of BIOL F103X designed for transfer students that are non-science majors who have completed a natural science course with no laboratory at another institution. This lab cannot be used as a biology elective by biological science majors. Course prerequisites: A natural science course with no laboratory.

Student Learning Outcomes
During this course, you will be introduced to terminology and major concepts that are used to describe and understand living systems. We will address the interrelatedness and interdependence of living system from the sub-cellular to the ecosystem level while studying important biological processes. At the end of this course, you will be able to:
- Demonstrate an understanding of the structure and function of cells, energy and information flow in living systems, mechanisms of evolution and ecological interactions among biological systems,
- Apply the scientific method by formulating hypotheses, proposing testable predictions and then testing to reach supportable conclusions about biological processes and systems, and
- Articulate the relevance of modern biology to society.

Course Information

Instructor contact
Dr. Anja Kade: ankade@alaska.edu

Meeting times
This online lab is asynchronous (i.e. we do not have a scheduled meeting time). However, this is NOT a self-paced course - you need to complete one lab session per week in chronological order. Please refer to the course schedule in the syllabus or on Blackboard and observe the deadlines.

Course structure
Each weekly online lab consists of the following components:
1. **Overview slides.** I will give you a brief introduction to the lab topic and define critical terms during a short movie based on lecture slides. Please note that you have the option of closed captioning to assist with understanding.
2. **Lab activities.** You will perform a variety of activities relating to each week’s lab topic through online activities and at-home labs. The activities are coupled with a set of questions, which are set up as "tests" in Blackboard. You can save your progress once started - just make sure to submit your work before the deadline of the respective lab.
3. **Research project.** In addition to the weekly lab activities, you will design and carry out a research project on plant growth. Each week is associated with a certain task that relates to your research project, such as creating a research study plan, setting up your plant experiment, collecting and analyzing data and presenting your findings to the class at the end of the semester.
Course layout
Your weekly learning materials and assignments are posted under the respective "Week" tab on the lefthand side menu in Blackboard. Each week's folder includes:

- a weekly lab module that contains learning goals, an overview slide lecture, description of (or links to) the lab activities and an assignment submission link where you can submit your work for grading,
- a weekly research project task and submission link related to your individual research project.

Course materials
The lab activities are a mix of both online labs as well as at-home, hands-on labs. For the online labs, you will need a strong and secure internet connection. For the at home labs, you will need to get the following materials:

- Carolina lab kits: The at-home lab kits ($140) are supplied by Carolina Biological Supplies (order #581601, [https://www.carolina.com/catalog/details.jsp?prodld=581601](https://www.carolina.com/catalog/details.jsp?prodld=581601)). Once you register for class, make sure to order your lab kit as soon as possible directly from Carolina as shipping and handling can take up to 10 days (and you want to make sure you can complete the first lab assignment on time). Alternatively, you can also purchase the lab kit at the UAF bookstore, but the price will be higher.
- Additional materials: Not all at-home labs will be kits from Carolina but require you to set up simple experiments at home. For these activities, you will need to get items such as a scale, AA batteries, knife, cups, sugar, salt, onion, potatoes, eggs, vinegar, soil, and seedling pots. The materials are listed on Blackboard under “Critical course information”.

Assessment and Evaluation
Your overall lab grade consists of two main components:

1. The weekly lab activities include overview background slides, assignment instructions and the assignment submission link.
2. The research project is broken down into weekly tasks that will guide you through experimental design, data collection, analysis of results and final presentation.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>13 Lab activities (25 points each)</td>
<td>325</td>
</tr>
<tr>
<td>13 Research project assignments (10 points each)</td>
<td>130</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>455</strong></td>
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Letter grades will be based on the percentage of total points earned and awarded as follows:

- A+ = 97-100%; A = 90-96%; A- = 88-89%
- B+ = 86-87%; B = 80-85%; B- = 78-79%
- C+ = 76-77%; C = 70-75%
- D = 60-69%
- F = 0-59%

How to check your grade
To check your grades for assignments and find comments from me, click on the My Grades link in the Blackboard sidebar menu. All assignments and any due dates are listed. To see my comments, click on the speech bubble icon to view overall comments and feedback. If the score is for a quiz, the title of the quiz is a link. Then click on the check mark or your score to see results and feedback. If the score is for an assignment, the title of the assignment is a link and by clicking this link you’ll be taken to your submission, grade and comments. If you see a green exclamation point, your assignment has not been graded yet.
<table>
<thead>
<tr>
<th>Lab due (date)</th>
<th>Lab activities</th>
<th>Research project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (09/08)</td>
<td><strong>Characteristics of life and lab safety</strong>&lt;br&gt;• Explore the properties of life&lt;br&gt;• Familiarize yourself with the functions of your microscope (Carolina)&lt;br&gt;• Study Carolina’s lab safety manual</td>
<td>Record introductory movie clip and review classmates’ movies</td>
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<td>2 (09/15)</td>
<td><strong>Scientific method and credible sources</strong>&lt;br&gt;• Design and conduct experiments with Alka-Seltzer tablets (Carolina lab)&lt;br&gt;• Evaluate credibility of sources by completing RADAR challenge*</td>
<td>Evaluate credibility of one source on seedling growth</td>
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<td>3 (09/22)</td>
<td><strong>Cell function</strong>&lt;br&gt;• Explore cell structure and function through a virtual reality tour&lt;br&gt;• Observe animal and plant cells with your microscope (Carolina lab)</td>
<td>Define research topic, question and hypothesis</td>
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<td>4 (09/29)</td>
<td><strong>Movement across membranes</strong>&lt;br&gt;• Determine the rate of osmosis in potato cubes&lt;br&gt;• Study the effects of osmosis in onion cells under the microscope</td>
<td>Write research proposal</td>
</tr>
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<td>5 (10/06)</td>
<td><strong>Cell cycle</strong>&lt;br&gt;• Identify stages of mitosis in animal and plant cells&lt;br&gt;• Create engaging photo project showing phases of meiosis</td>
<td>Create data table</td>
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<td>6 (10/13)</td>
<td><strong>DNA structure and function</strong>&lt;br&gt;• DNA replication, RNA transcription and protein synthesis (Carolina online lab)&lt;br&gt;• Extract your own DNA (Carolina lab)</td>
<td>Set up research project</td>
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<td>7 (10/20)</td>
<td><strong>Genetics</strong>&lt;br&gt;• Familiarize yourself with Mendel’s laws of heredity and analyze genetic crosses*&lt;br&gt;• Determine blood types of simulated blood (Carolina lab)</td>
<td>Monitor experiment and collect data I</td>
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<tr>
<td>8 (10/27)</td>
<td><strong>Evidence for evolution</strong>&lt;br&gt;• Construct and analyze phylogenetic trees*</td>
<td>Collect data II</td>
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<tr>
<td>9 (11/03)</td>
<td><strong>Mechanisms for evolution</strong>&lt;br&gt;• Collect and analyze data on anole lizards with regards to evolutionary adaptations&lt;br&gt;• Design your own super organism</td>
<td>Collect data III and end experiment</td>
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<td>10 (11/10)</td>
<td><strong>Population and community ecology</strong>&lt;br&gt;• Model mark-recapture methods to estimate the size of a goldfish population&lt;br&gt;• Analyze a graph showing predator-prey relationships&lt;br&gt;• Collect and analyze data on herbivore behavior in a reserve in Kenya*</td>
<td>Analyze data and create summary graphs</td>
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<td>11 (11/14, 11/17)</td>
<td><strong>Ecosystems and energy flow</strong>&lt;br&gt;• Analyze a marsh food web and consider biology management options&lt;br&gt;• Dissect owl pellets from two different habitats and compare prey (Carolina lab) - early due date!</td>
<td>Draft research presentation</td>
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<td>12 (11/24)</td>
<td><strong>Human impacts</strong>&lt;br&gt;• Study the science of climate change through movies&lt;br&gt;• Calculate and analyze personal carbon footprint and sustainability options&lt;br&gt;• Simulate the effect of ocean acidification with eggshells&lt;br&gt;• Determine the effect of acid rain on seedling germination</td>
<td>Post revised research presentation</td>
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<td>13 (12/08)</td>
<td><strong>Research symposium</strong>&lt;br&gt;• Review fellow students’ research presentations</td>
<td>Reflect on research experience</td>
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*This assignment is not fully accessible. If you need an accessibility accommodation, please contact me for an alternative assignment option that is accessible and covers the same content ideas.
Course Policies

Late work and grading policy
All assignments are due by the time noted in the course schedule and in the weekly assignment folders. If you turn in late work, 10% of the total possible number of points will be deducted from your points earned for every 24 hours an assignment is late. No assignment will be accepted three days after its due date.

Safety rules
It is important that you perform all lab activities in a safe manner at home. Thus, it is critical that you study Carolina’s lab safety manual (included in your Carolina hands-on activity kits) and familiarize yourself with the proper use of personal protective equipment, preventing contamination, safely performing lab activities, correct clean-up and safe field work. For example, wear appropriate clothing; use your personal protective equipment when needed; keep children and pets away from your work area; refrain from drinking, eating and smoking when performing labs; do not leave your work area unattended.

Academic integrity
Science is a process whereby people work together to achieve new knowledge and verify previously discovered knowledge. It is critical that we cite those ideas and information that we are using to form new knowledge. You must show us how you came to your ideas and thoughts by citing those works that helped you formulate your ideas. As described by UAF, scholastic dishonesty constitutes a violation of the university rules and regulations and is punishable according to the procedures outlined by UAF. Scholastic dishonesty includes, but is not limited to, cheating on an exam, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes use of another author’s words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing written work for fulfillment of any course requirement. Scholastic dishonesty is punishable by removal from the course and a grade of “F.” For more information read over the Student Code of Conduct.

Student Support Services

Notice of nondiscrimination
The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA’s statement of nondiscrimination available at www.alaska.edu/titleIXcompliance/nondiscrimination.

Student protection
Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans’ services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am
required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: www.uaf.edu/handbook.

**Student Handbook**
Go to the Student Handbook (www.uaf.edu/handbook) for things like: academic advising, tutoring, library and academic support, disability services, computing and technology, veteran and military support, academic complaint and appeals, late withdrawals, “classroom” behavior expectations and more.

**UAF eCampus Student Services**
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**UAF Help Desk and technical assistance**
Go to http://www.alaska.edu/oit/ to see about current network outages and technology news. For technical questions, contact the Help Desk at helpdesk@alaska.edu or 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks).