

# Biology 202 – Gateway to Ecology, Evolution and Organismal Biology (Spring 2019)

Dr. Jennifer L. Ison and Dr. Emily Elderbrock

## Instructor Contact Information:

Dr. Ison (lecture and lab): [REDACTED]

Dr. Elderbrock (lab): [REDACTED]

STEM Zone Intern: [REDACTED]

## Meeting Times:

Lecture: MWF 11:00-11:50 am, 060 RWW

Dr. Elderbrock's Lab Section: Mon. 1-3:50; 270 RWW

TA: [REDACTED]

Dr. Ison's Lab Section: Tues. 1-3:50 pm, 270 RWW

TAs: [REDACTED]



## Required Texts (Additional assigned readings will be posted on Moodle):

Freeman, S. *et al.* Biological Science 6<sup>th</sup> Edition; Benjamin Cummings.

Pechenik, J.A. 2016. A Short Guide to Writing about Biology, 9<sup>th</sup> Edition; Pearson- Longman.

\*Heard, S.B. 2016. The Scientist's Guide to Writing, 1<sup>st</sup> Edition; Princeton University Press

\*Only required for Dr. Ison's Tuesday lab section

## About this course:

How does biological diversity arise? Where do species come from? How do they work? How do they adapt? How do they interact with one another and their environment? You will explore answers to these questions as we delve into the fields of ecology, behavior, physiology, and evolutionary biology. Our exploration will include lectures, discussions, in-class activities, laboratory exercises and reading articles from the scientific literature. In addition to learning about the major concepts in these fields, you will gain skills in experimental design and in finding and communicating biological information. These skills will serve you well as you engage in our upper level curriculum and prepare to undertake your Independent Study project.

## Course objectives are broken down into content, skills, communication, awareness and respect for diversity:

**Content:** Understand fundamental biological principles and their implications and retain the knowledge essential to a broad understanding of biology

- Understand and apply introductory concepts in ecology, evolution, behavior and organismal physiology.
- Draw informed connections among the ecology, evolution, behavior, and physiology of an array of the earth's organisms

**Skills:** Use scientific methods of inquiry and the philosophy of science, including methodologies for distilling and integrating biological information

- Use an integrative approach to develop hypotheses and evaluate data to solve problems in ecology, evolution, behavior, and physiology
- Collaborate to design and conduct laboratory experiments to investigate various questions in biology
- Understand the findings of other researchers through reading scientific papers

**Communication:** Communicate scientific information effectively

- Explain the findings of other researchers in a clear and effective manner
- Produce a well-documented and clearly written lab report in the form of a scientific paper
- Provide constructive criticism to improve the communication skills of peers

**Awareness and Respect for Diversity:**

- Understand how diversity of knowledge and integrative thinking can contribute to solving biological problems
- Work with collaborators to solve problems

**Assessment:** Your grasp of these objectives will be assessed by your performance on four exams, in-class quizzes, and a variety of written assignments, and your engagement and professionalism in the class and lab. The breakdown of points will be as follows:

<b>Component</b>	<b>Percent of final grade</b>
Exams (3 exams at 14% each)	42%
Cumulative final exam	14%
Class quizzes	10%
Classroom and lab assignments	7%
Lab Project and Report 1 & 2 (12% each)	24%
Engagement and professionalism	3%
<b>Total</b>	<b>100%</b>



Final letter grades will be assigned on a standard plus/minus scale:

A	93 – 100%	C+	77 – 79%
A–	90 – 92%	C	73 – 76%
B+	87 – 89%	C-	70 - 72%
B	83 – 86%	D	60 – 69%
B–	80 – 82%	F	<60%

**NOTE:** You will be assigned one combined letter grade for the classroom & lab components of this course. On your transcript, that same letter grade will be reported for the classroom and lab components separately.

The significance of these letter grades according to the COW catalogue is as follows:

- A - distinguished achievement in all components of the course
- B - a high level of achievement in some components of the course
- C - a basic understanding of the subject has been demonstrated
- D - enough merit to warrant credit despite deficiencies in achievement in some components of the course
- F - unsatisfactory achievement in the course

### **Course Organization:**

We will address the goals of this course by exploring a series of interrelated topics organized into 9 modules. Within each module, topics will be organized to address an overarching question or problem, as follows:

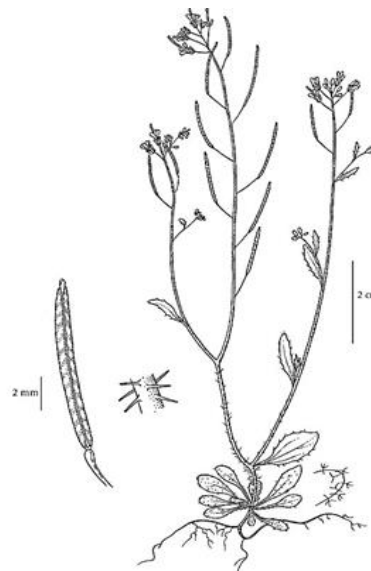
- Module 1: Is there an insect apocalypse? – integrative thinking
- Module 2: Why are there so many species of Anole lizards? – speciation, adaptive radiation
- Module 3: How do we grow plants on the International Space Station? – plant physiology, adaptation, plant diversity
- Module 4: Why are invasive species so successful? ecology, invasive species, population dynamics, species interactions
- Module 5: Why haven't we cured HIV/AIDS yet? – immunology, evolutionary medicine
- Module 6: How many fungal mating types are there? –diversity: mating system, reproduction, life cycle, & genetic
- Module 7: How do Icefish survive in the Antarctic? – animal physiology, adaptation
- Module 8: Why do manakins sing and dance cooperatively? – sexual selection, adaptation, evolution of cooperation
- Module 9: How will we feed the world in 2050? – ecosystem ecology, conservation

The topics in this course are all interrelated, and we will work throughout the course to draw connections among topics. Your textbook will be a resource for you, but it will not cover the material in the same way that we will introduce it in class. So, you will need to synthesize and integrate textbook information with in-class material and come out with a comprehensive appreciation for each topic and its relevance to ecology, evolution, and organismal biology. You will also be asked to read papers and articles that we post on Moodle. Our goal is to help you to develop mental models and tools for developing and answering questions in biology. This is a topic we find fascinating, and we look forward to our explorations this semester!

## Class and College Policies

### Expectations regarding preparation, attendance, and engagement:

- Please check your COW email and the course and lab Moodle pages daily to check for new announcements or reminders. You are responsible for staying up to date with all information that we announce through Moodle and over email.
- Laptop use in lecture is by permission of instructors only.
- Instructions for preparing for lab sessions will be posted on Moodle. You must read the instructions and complete any readings and assignments in advance of the lab. Many labs will have specific assignments called “Pre-Labs” and readings to ensure you are well-prepared for each laboratory period.
- Arriving to class and lab on time is important. If you are late to class or lab, or if you sleep during class, your engagement/professionalism grade will suffer.
- If you arrive to class late, you will not be allowed to make up any quizzes that were given, and you will not be given extra time to complete an in-class quiz.
- Attendance in class is strongly encouraged, but is ultimately up to you. If you do miss class, you must make your own arrangements for access to notes, handouts, etc.



**Attendance in laboratory is mandatory.** This lab involves much collaboration and active participation, so your attendance and engagement is extremely important for both you and your peers. Therefore, there is a strict attendance policy for lab; you will fail the course if you have 3 unexcused absences for lab. You must also be on time for lab. Some labs will take place off-campus, and we will not wait for a tardy student. If you miss the bus, then you have missed lab, and it will count as an unexcused absence.

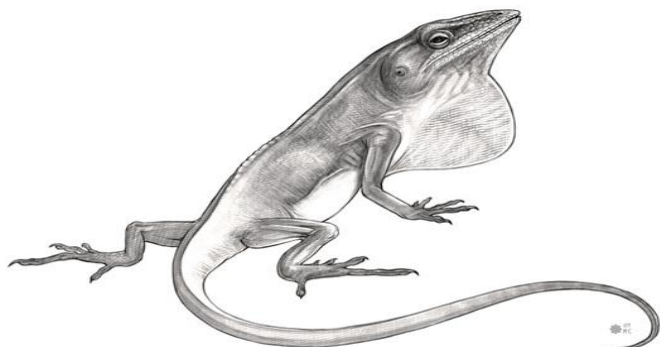
Though attendance is clearly important, your responsibility as a student constitutes more than simply showing up for class. You must also take an active role in your education—ask questions, seek answers, and become engaged in the classroom and laboratory! Some guidelines for effective engagement and professionalism in class and lab include the following: arrive on time, stay awake, make an effort to participate by asking/answering questions and contributing to discussions, avoid idle chitchat with your classmates when class is in session, be respectful of others’ ideas and contributions, and participate fully in group work. Your engagement/professionalism grade will be a direct reflection of whether or not you choose to adhere to these guidelines.

### **The STEM Scholar Zone: A place and a mindset**

The Zone is a STEM learning community located in Severance 105. It is a place where students enrolled in introductory STEM courses can find quiet space or collaborative space, whichever they need when they need it. Zone Interns will be there to answer questions and inspire learning consistent with Wooster’s “*independent minds, working together.*”

Spring 2019 Hours for the STEM Scholar Zone (beginning Wed., Jan. 16<sup>th</sup>)

Sunday – Thursday      2-4 PM and 8-10 pm



The STEM Success Initiative has been collecting data on students’ use of the Zone. The data show that attending the Zone four times can help boost a student’s final course grade by 1/3 of a letter grade, on average (unpublished data from 2014-2016, for Biol 111 and Chem 111 courses). In this course, you are required to attend the STEM Zone at least three times during the semester, for at least one hour each time. One (or more) of these visits should be a Module Workshop. Please be sure to swipe in and out with your ID card.

## Policies regarding exams, quizzes, and late assignments:

- Make-up exams will only be given with a letter from a doctor or the Dean of Students. You must contact the instructors BEFORE the scheduled exam or as soon as possible afterwards if it is a medical emergency; be prepared to make-up the exam as soon as possible. Missing an exam without an excused and documented absence will result in you receiving zero points for the exam.
- In-class quizzes will be once a week. Make-up quizzes will not be possible, but we will drop your lowest two quiz grades. Should you miss class for any reason on a day that a quiz is given, that zero will serve as one of the two scores that are dropped.
- Late assignments for both class and lab will be penalized as follows. If we discuss an assignment in-class you cannot turn it in after the class discussion. For all other assignments, each 24-hour period an assignment is late, you will lose 10% of the possible points. Assignments that are more than one week late will not be accepted and will receive a zero. Exceptions to the above policies may be made on a case-by-case basis and only under compelling circumstances.
- If you believe that an error has been made in grading your course work please contact us within a week from the date the assignment was returned to you.

**The Learning Center – APEX:** The Learning Center, which is located in APEX (Gault library) offers a variety of academic support services, programs and 1:1 meetings available to all students. Popular areas of support include time management techniques, class preparation tips and test taking strategies. In addition, the Learning Center coordinates peer-tutoring for several academic departments. Students are encouraged to schedule an appointment at the APEX front desk or call [REDACTED].

The Learning Center also coordinates accommodations for students with diagnosed disabilities. At the beginning of the semester, students should contact Amber Larson, Director of the Learning Center [REDACTED] to make arrangements for securing appropriate accommodations. Although the Learning Center will notify professors of students with documented disabilities and the approved accommodations, it is the responsibility of the students to speak with professors during the first week of each semester. If a student does not request accommodations or does not provide documentation, faculty are under no obligation to provide accommodations.

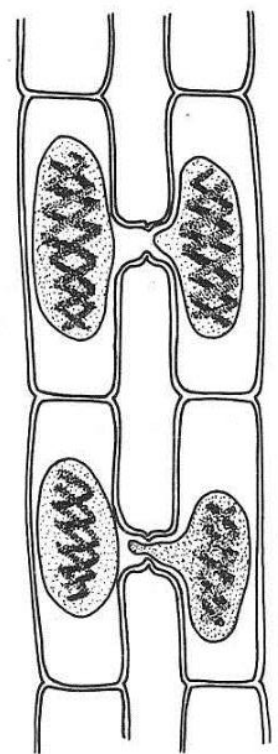
## Academic Integrity:

Each student in this course is expected to abide by the Code of Academic Integrity as printed in the Scots Key. We have a zero tolerance policy for academic dishonesty, including plagiarism and cheating. Because laboratory exercises often involve group work and group study sessions can be useful, you are encouraged to study with other students to discuss information and concepts covered in class. However, any work submitted by a student in this course for academic credit must be the student's own work. Penalty for violation of this Code may result in no credit for the assignment, failure of the course, and/or disciplinary action by the College. Here are some specific *examples* (not an exhaustive list!) of academic dishonesty:

- Copying another student's assignment – either a current or past student.
- Collaborating with another student on a homework assignment without express permission from the instructors.
- Paraphrasing/copying any text from any resource without providing a reference.
- Extensive paraphrasing/copying of text from any resource (even if you provide a reference).
- Turning in the same assignment to multiple courses, in the same or different semesters, without prior consent from both professors

## Title IX Reporting Policy:

The College of Wooster is committed to fostering a campus community based on respect and nonviolence. In accordance with Title IX, Wooster is legally obligated to investigate incidents of sexual harassment and sexual assault that occur on our campus. Faculty who become aware of any incident of sexual violence (including harassment, rape, sexual assault, relationship violence, or stalking) are required by law to notify Wooster's Title IX Coordinator. For more information about your rights and reporting options at Wooster, including confidential and anonymous reporting options, please visit <http://www.wooster.edu/offices/titleix/>.



**Co-curricular and Extra-curricular Activities:**

The College of Wooster is an academic institution and its fundamental purpose is to stimulate its students to reach the highest standard of intellectual achievement. As an academic institution with this purpose, the College expects students to give the highest priority to their academic responsibilities. When conflicts arise between academic commitments and complementary programs (including athletic, cultural, educational, and volunteer activities), students, faculty, staff, and administrators all share the responsibility of resolving them. It is your responsibility to inform at least one of the co-instructors of conflicts between academic commitments to this course and complementary programs in which you participate as soon as you are aware of them. You are to discuss with us how you might fulfill your academic commitments to our mutual satisfaction without sacrificing the academic integrity and rigor of the course.



**Bio 202 – Lecture schedule (including topics, readings, major assignments, and exams)**

**\*\*Lab schedules will be distributed during the first day of lab\*\***

This schedule is subject to change, and several additional assignments will be given.

For lecture readings, F6th = Freeman, 6<sup>th</sup> edition (Please note you are welcome to use the 5<sup>th</sup> edition of Freeman. If you have a the 5<sup>th</sup> edition, please see your instructor or your ZI for chapter conversions).

**Additional readings will be assigned. Please pay attention in class and check Moodle for these assignments.**

Week	Monday	Wednesday	Friday
<b>Week 1</b> Jan 14-18	Course introduction M1: Is there an insect apocalypse?	M1: Is there an insect apocalypse?	M2: Why are there so many Anole lizards?  F6th: Sections 24.intro-24.1 & 25.
<b>Week 2</b> Jan 21-25	<b>Martin Luther King Service Day</b>  No class	M2: Why are there so many Anole lizards?  F6th: Sections 23.intro, 23.4-23.5	M2: Why are there so many Anole lizards?  F6th: Sections 24.2-24.4 <b>Quiz</b>
<b>Week 3</b> Jan 28-Feb 1	M2: Why are there so many Anole lizards?  F6th: Section 25.3	M3: How do we grow plants on the International Space Station?  F6th: Sections 28.intro-28.2 <b>Quiz</b>	M3: How do we grow plants on the International Space Station?  F6th: Sections 37.intro-37.1, & 37.4
<b>Week 4</b> Feb 4-8	M3: How do we grow plants on the International Space Station?  F6th: Subsection 'The Cell Elongation Response' (37.2)	M3: How do we grow plants on the International Space Station?	Exam Review  <b>Quiz</b>
<b>Week 5</b> Feb 11-15	<b>EXAM 1</b>	M4: Why are invasive species so successful?: Why are there so many rabbits in Australia?  F6th: Sections 51.intro- 51.1 & 51.3	M4: Why are invasive species so successful?: Why are there so many rabbits in Australia?  F6th: Section 51.3

Week	Monday	Wednesday	Friday
<b>Week 6</b> <b>Feb 18-22</b>	M4: Why are invasive species so successful?: Did you know you can eat lionfish?  F6th: Sections 52.intro-52.1 <b>Quiz</b>	M4: Why are invasive species so successful?: Did you know you can eat lionfish?  F6th: Section 52.2	M4: Why are invasive species so successful?: Kiss your Ash good-bye!
<b>Week 7</b> <b>Feb 25-Mar 1</b>	M5: Why haven't we cured HIV/AIDS?  <b>Quiz</b>	M5: Why haven't we cured HIV/AIDS?  F6th: Sections 48.intro-48.1,48.3-48.4	M5: Why haven't we cured HIV/AIDS?  F6th: Sections 33.intro -33.1 & subsection 'How do viruses enter a cell?' (33.2)
<b>Week 8</b> <b>Mar 4-8</b>	M5: Why haven't we cured HIV/AIDS?  <b>Quiz</b>	Exam Review	<b>EXAM 2</b>
<b>Mar 11-22</b> <b>SPRING BREAK</b>			
<b>Week 9</b> <b>Mar 25-29</b>	M6: How many fungal mating types are there?  F6th: Sections 38.intro -38.1 & 47.intro - 47.1	M6: How many fungal mating types are there?  F6th 29.intro & subsections 'Variation in reproduction' & 'Four major types of life cycles' (both 29.3)	M6: How many fungal mating types are there?  <b>Quiz</b>
<b>Week 10</b> <b>Apr 1-5</b>	M6: How many fungal mating types are there?	M7: How do icefish survive in the Antarctic?	M7: How do icefish survive in the Antarctic?  F6th: Section 42.4 <b>Quiz</b>
<b>Week 11</b> <b>Apr 8-12</b>	M7: How do icefish survive in the Antarctic?	M7: How do icefish survive in the Antarctic?	Exam Review  <b>Quiz</b>
<b>Week 12</b> <b>Apr 15-19</b>	<b>EXAM 3</b>	M8: Why do manakins sing and dance cooperatively?  F6th: Sections 23.3	M8: Why do manakins sing and dance cooperatively?  F6th: Section 50.3
<b>Week 13</b> <b>Apr 22-26</b>	M8: Why do manakins sing and dance cooperatively?  F6th: Section 50.6 <b>Quiz</b>	M8: Why do manakins sing and dance cooperatively?	<b>Independent Study Symposium</b>  No class
<b>Week 14</b> <b>Apr 29- May 3</b>	M9: How will we feed the world in 2050?  F6th: Sections 53.intro-53.2	M9: How will we feed the world in 2050?	M9: How will we feed the world in 2050? Course wrap-up
<b>Finals Week</b> <b>May 6-9</b>	<b>Comprehensive final exam: Monday at 9am</b>		