

Biology and the Citizen
Biology 1010
Summer 2017, MTWRF 10:40–11:50 AM, AGRS 101

Course Instructor: Michael Orr

Research area: bee classification and evolution

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Office hours in BNR244: Tuesday 12:10-1:10pm, Wednesday 12:10-1:10pm, Thursday 12:10-1:10pm

Course Format: During class, you will listen to lectures, watch video clips, participate in demonstrations, and discuss with your peers. Outside of class, you will read the textbook and take online quizzes. Your major assessments are four unit exams, participating in a citizen science project, and writing an assessment of the quality of a popular media science news article.

Essential Learning Objective	Learning Outcomes
Objective 1. Gaining factual knowledge (terminology, classification, methods, trends)	You will be able to recall biological facts, such as how meiosis produces genetic variation.
Objective 2. Learning fundamental principles, generalizations, or theories.	You will be able to combat misconceptions about key processes of the natural world, such as evolution.
Objective 3. Learning to apply course materials (to improve rational thinking, problem solving, and decisions)	You will be able to apply your biology knowledge to making decisions as a world citizen, such as when you propose solutions to real-world problems or when assessing the accuracy of science news reporting.

Required Course Materials

- **Canvas:** You will use our Canvas site to receive important course announcements, download class materials, submit assignments, take reading quizzes and exams, and view grades. *Please make sure that you receive immediate or daily notifications for announcements.*
- **Textbook:** You will have frequent reading assignments to engage with the course content outside of class. We will use a free online textbook, Concepts of Biology. Access it here: <https://openstax.org/details/concepts-biology>
- **iClicker remote:** These electronic polling devices allow you to gauge and demonstrate your understanding and share your thoughts in class. Your use of an iClicker remote also helps your instructor determine whether he needs to use alternative instructional approaches to explain challenging concepts. Register your remote by May 9th. You may not use another student's remote for them. You may use the iClicker1 remote, iClicker2 remote, or the REEF polling app for iPhone or Android, but using a remote is recommended. *Note that Distance students MUST use the REEF polling app.*

Assignments

- **In-class practice and discussion (iClicker).** I will ask a few practice or discussion questions, variably spread throughout each class session, that you will answer for participation points. If you answer 75% or more of all the questions asked across the semester, you will receive full credit (20 pts). You will receive 75% credit for answering 50-74.9% of the questions (15 pts), 50% credit for answering 25-49.9% of the questions (10 pts), 25% credit for answering 10-24.9% of the questions (5 pts), and 0% for answering <10%. This grading

scheme allows for errors that may occur with the iClicker technology and rare excused absences. Having a functioning remote or phone with the REEF polling app is *your* responsibility. Note that the number of questions asked may vary by lecture.

- **Out-of-class practice (weekly reading quizzes).** Outside of class, you will take online Canvas quizzes twice weekly regarding the background knowledge you've gained from reading the textbook. They will consist of four questions that are worth 0.5 pts each. They will always be **due at 3pm on Wednesdays and Fridays**, unless otherwise noted (see tentative schedule below); both quizzes will become available to take at the beginning of each week. Where quizzes are absent on Wednesdays or Fridays, the material that they would have covered may be carried over to the next scheduled quiz, and readings assigned for a specific day will be included in quizzes that are due on those days. You will be allowed only one attempt for each quiz, and they are not timed. You may view the correct answers after submission. Your lowest quiz score will be dropped.
- **Unit exams.** The in-class practice questions and reading quizzes will help you prepare for the unit exams, and exams will emphasize what is covered during lecture. You will need to use both simple fact recall and higher-level scientific reasoning skills on the exams. We will not meet in class on exam days; you will take exams on Canvas using a computer *with a reliable internet connection*. Exams are closed-book and timed (50 minutes), and the questions are all multiple choice. Requests to take exams at times other than the regularly scheduled periods will be considered *only for excused absences* (see below for attendance policy). A practice exam will be available on Canvas in the first week of class.
- **Citizen science participation.** You will apply your knowledge of the process of science and contribute to an authentic, national citizen science project, such as helping scientists identify proteins in microscope images. See Canvas for a list of projects and instructions.
- **Assess quality of science reporting.** You will select an important, recent scientific paper and then find a news (online) article that reports on that paper. You will then assess the accuracy of that news article by comparing it to the original source of the discovery (scientific paper). See Canvas for details.

Grading Policy: Final course grades are based on the following scale and will not be rounded up to the nearest whole number: A (94-100%), A- (90-93.9%), B+ (87-89.9%), B (84-86.9%), B- (80-83.9%), C+ (77-79.9%), C (74-76.9%), C- (70-73.9%), D+ (67-69.9%), D (60-66.9%), and F (below 60%). Your grade will reflect your performance on the various assignments, which will be weighted as follows:

Assignment	Weight (%)
In-class questions (iClicker participation)	10% (20 pts)
Out-of-class quizzes (two most weeks, lowest score dropped)	10% (20 pts)
Unit 1 exam	15% (30 pts)
Unit 2 exam	15% (30 pts)
Unit 3 exam	15% (30 pts)
Unit 4 exam	15% (30 pts)
Citizen science participation	10% (20 pts)
Science reporting assessment	10% (20 pts)
TOTAL	100% (200 pts)

Tentative Schedule: The topic scheduled for each date might change, depending on the pace at which we move through the material. The exam schedule, however, will not change. **Quizzes are listed on the schedule on the day that they're due at 3pm, although both will be available at the start of the week in which they're due. The citizen science and science reporting assignments are both due at 5pm on the dates given in the syllabus.

Day	Date	Topic	Readings & Assignments
M	8-May	Course intro, the process of science	Chapter 1; syllabus and Canvas site
T	9-May	Unit 1: Cell biology and physiology Cell structure/function	C. 2, C. 3, C. 13.1
W	10-May	Cell structure/function, continued	C. 3, C. 13.2, C. 13.3; unit 1 quiz 1
R	11-May	Cellular reproduction	C. 6 (except 6.3), C. 7
F	12-May	Nutrient intake: plants vs animals	C. 5, C. 16.2; unit 1 quiz 2
M	15-May	Circulation and respiration	C. 16.3
T	16-May	Immunology and medical entomology	C. 17
W	17-May	Nervous and endocrine systems	C. 16.4, C. 16.6
R	18-May	UNIT 1 EXAM	
F	19-May	Unit 2: Genetics DNA structure and replication	C. 9.1, C. 9.2; unit 2 quiz 1
M	22-May	Gene expression and regulation	C. 9.3, C. 9.4, C. 9.5
T	23-May	Phenotypes: the visible outcome of genes	C. 8
W	24-May	Phenotypes, continued	C. 8; unit 2 quiz 2
R	25-May	Case study: cancer biology	C. 6.3
F	26-May	Biotechnology and the future of genetics	C. 10; unit 2 quiz 3
M	29-May	MEMORIAL DAY – NO CLASS	
T	30-May	UNIT 2 EXAM	
W	31-May	Unit 3: Evolution Overview and brief history of the field	C. 11.1, C. 11.3, C. 11.5; unit 3 quiz 1
R	1-Jun	Selection and mutation	C. 11.2, C. 11.3
F	2-Jun	Genetic drift and gene flow	Unit 3 quiz 2
M	5-Jun	Speciation and the tree of life	C. 11.4, C. 12
T	6-Jun	Diversity of life: fungi and plants	C. 13.4, C. 14
W	7-Jun	Diversity of life: arthropods 1	C. 15.3, C. 15.4; unit 3 quiz 3
R	8-Jun	Diversity of life: arthropods 2	
F	9-Jun	Diversity of life: vertebrates	C. 15.5 (“Chordates” section), C. 15.6; citizen sci. assignment due
M	12-Jun	Human evolution	
T	13-Jun	UNIT 3 EXAM	
W	14-Jun	Unit 4: Ecology; Population ecology	C. 19.1, C. 19.2; unit 4 quiz 1

R	15-Jun	Community ecology	C. 19.4
F	16-Jun	Ecosystem ecology	C. 20; Unit 4 quiz 2; science reporting assignment due
M	19-Jun	Evolutionary ecology case studies	
T	20-Jun	Conservation and human impact	C. 21, C. 19.3
W	21-Jun	Global climate change	Unit 4 quiz 3
R	22-Jun	My research: bee nesting biology	Read scientific paper on Canvas
F	23-Jun	UNIT 4 EXAM	

Attendance policy: Attendance is an individual student responsibility. Your instructor will not provide an opportunity for any student to make up work missed because of an unexcused absence. An absence may be excused for the following reasons: university-sponsored or sanctioned activity; mandatory participation as a student-athlete in NCAA-sanctioned competition; injury or illness or medical condition that is too severe or contagious for the student to attend class (elective medical service does not count); major injury or illness or medical condition or death in a student's immediate family (parents, siblings, spouse, children); required participation in military duties; mandatory admissions interviews; and participation in legal proceedings. A student requesting an excused absence must provide written evidence to the instructor substantiating the reason for the absence within a week before the absence if it is a planned absence, or within two working days after the absence if it is unplanned (*e.g.*, a medical confirmation note that contains the date and time of the visit and the medical professional's signature). If the absence is excused, the student and instructor will choose a date to make up the work (*i.e.*, end-of-unit exams). Make-up work must be completed within 14 calendar days of the last day of the initial absence. Excused absences may not exceed 20% of the class meetings.

The Honor System and Plagiarism: To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge: "I pledge, on my honor, to conduct myself with the foremost level of academic integrity." A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge: 1) espouses academic integrity as an underlying and essential principle of the Utah State University community; 2) understands that each act of academic dishonesty devalues every degree that is awarded by this institution; 3) is a welcomed and valued member of Utah State University. Plagiarism includes knowingly "representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

Students with Disabilities: The Americans with Disabilities Act states: "Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the

disability through the Disability Resource Center (DRC, ph. 797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor. In cooperation with the DRC, course materials can be provided in alternative format, large print, audio, diskette, or Braille."