

BI 251

Ecology & Evolution

Lecture: M, W, F 8:30-9:20

Laboratory: Th 12:30-3:15

MS 124

Professor: Dr. Scott A. Kimball

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Office: Mulvane 229

Office hours: MW 7:30-8:30am and
11:30am-2:00pm

Course Description:

This course is an entry level course for biology majors. The course will work from an evolutionary perspective to address the basic ecological levels of structure and function including populations, communities and ecosystems. Three lectures/discussions and one laboratory session will occur each week. *Prerequisite: none.*

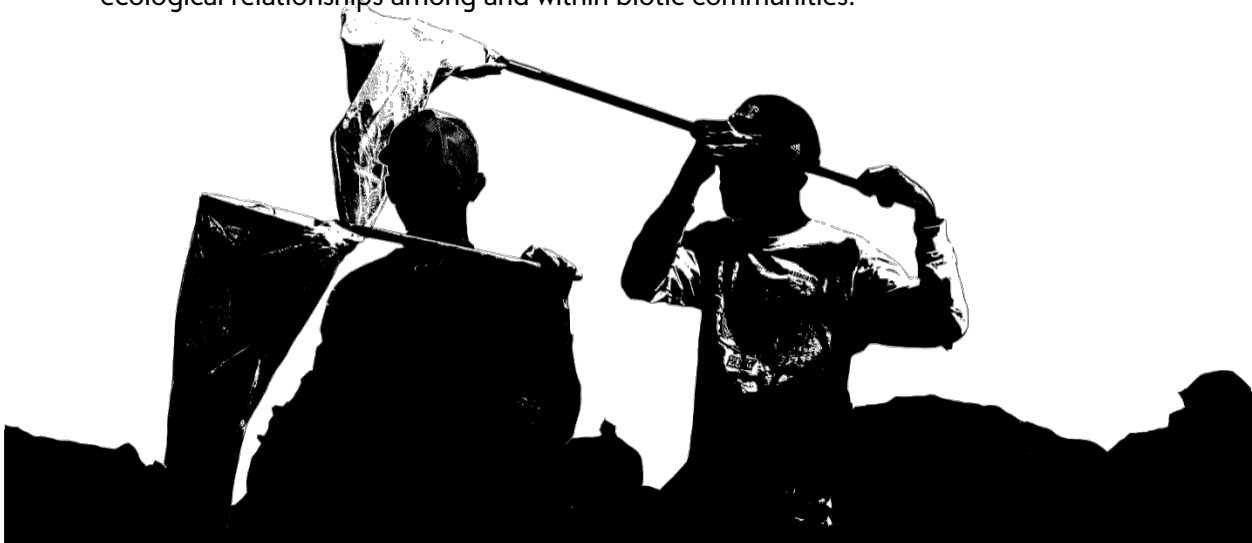
Required Texts:

- Lecture Text: selected chapters from *Urry LA, Cain ML, Wasserman SA, Minorsky PV, Orr RB. 2021. Campbell Biology, 12th Ed. Pearson. ISBN 9780135188743.*
- Lab Manual: *Exercises available online on Moodle*
- field notebook – *Rite in the Rain*® Metric Field Notebook N^o 363 (4⁵/₈ in x 7 in)

Course Objectives:

Students completing this course should be able to:

- Explain the concept of life and how it is studied by biologists using the scientific method.
- Explain the role of climate in determining the distributions of, and interactions among, organisms.
- Explain the major concepts of population, community and ecosystem ecology.
- Explain the importance of the concept of evolution by natural selection to our understanding of biology.
- Explain the mechanisms of evolution that operate on populations of organisms.
- Use the ecological techniques and tools available in the lab and in the field to study the ecological relationships among and within biotic communities.



Grading:

The final grade is calculated on a percentage basis: Lecture = 75% Lab = 25%

Lecture Grading:

Weekly Quizzes = 40%

A short quiz will be given weekly via Moodle on the Monday of each week. Quizzes must be taken during the regularly scheduled lecture period. All questions will come from the lecture, text book, and class discussion from the preceding week's lectures. Each quiz may consist of multiple-choice questions, fill-in-the-blank, matching, true/false, and/or short answer questions. If you are absent for a quiz you will receive a zero. The lowest 2 quiz grades will be dropped. **There are no make-up quizzes.**

3 One-hour Exams = 30%

Each non-cumulative exam will cover approximately equal proportions of course material and will be organized around major themes in the course.

Final Exam = 10%

A cumulative exam will cover material from the lecture section of the course.

Out of Class Assignments = 15%

Students will be assigned to work together in small groups or individually to discuss and analyze biological questions related to lecture topics.

Attendance and Participation = 5%

Class participation is expected and only possible by attending every class. Contributions to class discussions, group activities, and asking/answering questions during lecture will ensure full credit, but more importantly, participation will provide you the best opportunity to succeed in this course.

Laboratory Grading:

4 Practical Exams = 50%

Each non-cumulative practical exam will cover approximately equal proportions of course material. By their nature, practical exams are extremely difficult to administer; therefore, attendance for exams is critical and missed exams can only be made-up under extreme circumstances. The lowest lab practical score will be dropped from the final grade.

Field Journal = 15%

Students are expected to keep a detailed field notebook describing their work during lab to be turned in with each lab report that will be graded for completeness and tidiness of the notes.

Lab Reports = 20%

Each student will submit a laboratory report detailing field and laboratory activities and results at the start of the second lecture period following the completion of the lab exercise. See the lab report criteria section of the lab manual on Moodle for details about the lab report format.

Group Project = 15%

Each student as part of a small group will propose a testable hypothesis and prediction over an assigned research topic and then design and conduct a test of the prediction. Each student will *individually* prepare a lab report describing the topic and experiment. Finally, the group will work together to prepare and present a PowerPoint presentation summarizing their efforts.

Grade Scale:	A	94-100%	A-	90-93%		
	B+	87-89%	B	84-86%	B-	80-83%
	C+	77-79%	C	74-76%	C-	70-73%
	D+	67-69%	D	60-66%		
	F	0-59%				

Attendance/Make-up Policy:

Attendance during class meetings is mandatory and expected, but certain circumstances may require an isolated absence. It is the student's responsibility to notify the professor as soon as possible of the expected absence (absolutely no later than one day following the absence, in the case of an emergency) and to make necessary arrangements for lecture or laboratory materials. No make-up quizzes will be allowed.

Failure to attend a lab generally means that a student will be unable to collect data or other information necessary for the lab report. Therefore, if a student misses a lab activity and still wishes to submit a report, they: 1) ***must*** acknowledge their absence in the laboratory report, 2) ***must*** request lab data from a fellow student, and, 3) *if given permission to use another student's data, must* attribute authorship of that data to the member(s) of the class that collected the data. ***Failure to do so constitutes academic misconduct and will be treated accordingly (see below).***

It is a serious offense to miss a lab or lecture exam. If this happens a grade of zero will be assigned for the missed exam. It is the responsibility of the student to contact the professor ***prior to*** the exam to schedule a make-up. If a student fails to contact the professor prior to the absence/missed exam to make arrangements, a make-up may not be granted. Special considerations may be made, on a case by case basis, if an exam is missed due to completely unavoidable circumstances. In this case, a student may be permitted to take a make-up exam if they contact the professor prior to the day of the next scheduled class. Each student must present a valid excuse at the time of the make-up. Make-up exams, if they are granted, must be completed within 1 week of the original exam date. Make-up exams will be administered at the convenience of the professor. Only one make-up exam may be granted per semester.

Note to Athletes: Athletes who expect to miss an exam or a quiz due to sanctioned activities must notify the instructor as soon as possible and in all cases before the week of the expected absence. In these cases, quizzes and exams may be administered in alternative formats or at earlier dates, depending on specific circumstances and at the discretion of the professor.

Students with Disabilities:

Baker University is committed to providing "reasonable accommodations" in keeping with Section 504 of the Rehabilitation Act and the Americans with Disability Act of 1992. Access Services coordinates accommodations and services for all eligible students with disabilities. If you have a disability and wish to request accommodations and have not contacted Access Services, please do so as soon as possible. Access Services is located in the Office of Student Academic Success (in Collins Library (lower level); 785-594-8352; sunny.allen@bakeru.edu). Information about Access Services can also be found at www.bakeru.edu/sas. If accommodations have been approved by Access Services, please communicate with your professor(s) regarding your accommodations to coordinate services.

Academic Honesty:

Students are expected to take responsibility for their own work and provide appropriate credit to the authors of works used by the student to complete course work. Students who fail to meet the

University's standard of academic honesty in this course will be subject to course penalties at the discretion of the professor, which may include, but are not limited to, automatic failure of an assignment/assessment and/or failure of the course. In addition to course penalties invoked by the professor, all instances of academic misconduct will be reported to the Dean of the CAS who will invoke mandated institutional sanctions as defined in the Student Handbook. Please review the student handbook for a full description of the University's policy on academic misconduct.

From the Student Handbook: Baker University expects students and professors to have solely completed or prepared the work or research that bears their name, and to acknowledge the materials and sources of others.

Students

1. Have the responsibility to do their own academic work.
2. Must acknowledge sources of their materials and material that is the work of others.
3. Have the responsibility to inquire of the professor when they are uncertain as to what constitutes proper acknowledgment.
4. Have the responsibility to inquire of the professor as to what materials and aids are permitted in testing and research work.
5. Have an obligation to know their rights and responsibilities as delineated in the Baker University Student Handbook.
6. Have the responsibility to know the University's position with respect to academic misconduct as set forth in [the student handbook].

Honors Contracts:

Any student with a cumulative grade point average of 3.50 that is interested in taking this course for honors designation should talk to me about the details involved and fill in the necessary form, obtain the required signatures and meet with the honors program director to review the contract before turning in the form to the Records Office. The last day to submit a proposal for an Honors Contract is the last day to add a course for the semester.

Credit Hour Definition and Associated Course Expectations: Consistent with best practices in higher education, Baker University subscribes to the federal definition of the "credit hour" endorsed by the Higher Learning Commission. Driven by intended learning outcomes and verified by evidence of student achievement, the "credit hour" is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom (or direct faculty) instruction and a minimum of two hours of out-of-class student work per week for the duration of the course enrollment period. A 3-credit-hour course, for example, requires approximately 45 classroom contact hours, roughly 90 out-of-class work hours and approximately 135 total instructional hours over the course of a 15-week semester. In that this course carries 4 hours of credit (3 lecture, 1 lab), approximately 60 hours of classroom instruction and 45 hours of laboratory and field instruction have been planned over the scheduled 15-week period. In addition, students are expected to spend roughly 150 hours (10 hours per week) on out-of-class assignments which include: a) assigned text readings, b) reading-related exercises and associated Moodle forum postings, c) unit evaluation and final exam preparation, d) outside lab-related assignments, e) statistical and other homework problems, and f) literature review research and manuscript preparation.

Special Note: EcoEvo is an intense course with a very fast pace. It is the responsibility of the student to keep up in class. Missing lecture or lab will almost certainly result in a lower course grade. It will be

critical for students to keep pace by reading ahead in the chapters and by spending significant amounts of time outside of class studying and preparing for quizzes and exams. Utilize all available resources when studying, including lecture notes, text chapter review questions, figures and tables from the text and lab manual, and online resources. The formation of study groups/partners is strongly encouraged.

Tips for Success:

- Spend at least 10 hrs. per week outside of class studying for lecture and lab.
 - This does not need to take place all at one time (and is best if it doesn't). Keep a study journal with a list of the topics covered and the time spent on each to make sure you are allowing yourself enough time each day/week.
 - Break up your study time into manageable "units". Dedicate each study session to one subunit of the lecture/lab material and become comfortable with that unit before moving on to the next.
 - Eliminate distractions during study time. This means turn off all electronics, remove yourself from noisy environments, and let your roommates/family know that you will need time alone while you are studying
 - Do not get behind studying!! There is *no* extra time in the semester to catch up.
- Pay special attention to the figures and tables in the text book. They are very good at summarizing information and are often (though not always) cited in lecture.
- Look for videos and images online. YouTube is a great resource for videos – though some videos are better than others.
- Record the lecture. This can be done with a cheap MP3 recorder or smart phone placed at the front of the room prior to lecture. I do not give out my lecture PowerPoints, but I encourage you to record lectures so that you can go back and listen more carefully to what was said while you may have been writing.
- Make a friend in class. A classmate can help you study, make sure you get missed notes, and add to a support network for you as you work through all of this new information.
- Please ask for help (sooner than later!). I am always willing to help, but I need to know that you would like some assistance. Then we can see how I can best help you succeed.

Lecture Schedule (subject to change):

<u>Dates</u>	<u>Subject</u>	<u>Text Chapter (pg.)</u>
Week 1 Aug 23/25	The Scientific Process in Ecology and Evolution	1 (1)/1 (2)
Week 2 Aug 28/30/Sep1	Quiz 1 Introduction to Ecology	2 (29)/52 (1162)
Week 3 Sep 4/6/8	<i>Labor Day (no class Sep 4) --- YIPPEEE!!!!</i> Quiz 2 Global Ecology and Biomes	2 (36)/52 (1168)
Week 4 Sep 11/13/15	Quiz 3 Energy Flow and Material Movement in Ecosystems	3 (59)/55 (1236)
Week 5 Sep 18/20/22	Quiz 4 Carbon Cycling	3 (72)/55 (1248)
Week 6 Sep 25/27/29	Exam 1 --- Sep 25 Community Ecology	1-3/1,52,55 4 (85)/54 (1212)
Week 7 Oct 2/4/6	Quiz 5 Community Ecology cont.'d	4 (100)/54 (1226)
Week 8 Oct 9/11/13	Quiz 6 Population Ecology <i>Fall Break (no class Oct 13) --- WOOHOO!!!!</i>	5(113)/53 (1188)
Week 9 Oct 16/18/20	Quiz 7 Metapopulations	5 (130)/53 (1204)
Week 10 Oct 23/25/27	Quiz 8 Conservation Biology and Restoration Ecology	6 (141)/56 (1258) 3 (75)/55 (1251)
Week 11 Oct 30/Nov 1/3	Exam 2 --- Oct 30 Evolution and Natural Selection Adaptation	3-6 7 (171)/22 (466) 7 (178)/22 (472)
Week 12 Nov 6/8/10	Quiz 9 Evolution of Populations	8 (193)/23 (484)
Week 13 Nov 13/15/17	Quiz 10 Patterns of Evolution	8 (205)/23 (495)
Week 14 Nov 20/22/24	Quiz 11 Species Concepts and Speciation <i>Thanksgiving Break (no classes Nov 22/24) --- YEEHAW!!!!</i>	9 (217)/ 24 (504)
Week 15 Nov 27/29/Dec 1	Quiz 12 Macroevolution	10 (239)/ 25 (523)
Week 16 Dec 4/6/8	Exam 3 --- Dec 6 Final Exam Preparation	7-10/22-25
FINAL WEEK Dec 11	Final Exam --- Monday, 8:00-11:00 AM	

Laboratory Schedule (subject to change):

Date	Subject
Week 1 Aug 24	Intro to Lab The Campus Ecosystem
Week 2 Aug 31	Aquatic Ecosystems: Lakes
Week 3 Sep 7	Aquatic Ecosystems: Streams
Week 4 Sep 14	Practical Exam 1 Grassland Ecosystems
Week 5 Sep 21	Woodland Ecosystems
Week 6 Sep 28	Migration & Orientation Behavior
Week 7 Oct 5	Practical Exam 2 Ecotone Ecology
Week 8 Oct 12	<i>Fall Break (no lab Oct 12) --- YESSIRR!!!!</i>
Week 9 Oct 19	Biomes – University of Kansas Museum of Natural History
Week 10 Oct 26	Field Phenology
Week 11 Nov 2	Practical Exam 3 Flowers, Seeds, & Germination
Week 12 Nov 9	Germination cont'd. Carbon Sequestration by Campus Trees
Week 13 Nov 16	Natural Selection & Evolution Group Project
Week 14 Nov 23	<i>Thanksgiving Break (no lab Nov 23) --- YOWZA!!!!</i> Continue work on Group Project
Week 15 Nov 30	Practical Exam 4 Group Project
Week 16 Dec 7	Group Presentations

