

Term Information

Effective Term Spring 2014

General Information

Course Bulletin Listing/Subject Area Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org Evolution, Ecology & Org Bio - D0390
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 3498
Course Title Undergraduate Research in Behavioral Ecology
Transcript Abbreviation UG RES BEHAV ECOL
Course Description Supervised independent research opportunities in behavioral ecology for undergraduates considering careers in basic scientific research, secondary education, or graduate research programs in biological and behavioral sciences. Formal instruction on experimental research design, literature review, research ethics, and elementary statistical analyses.
Semester Credit Hours/Units Fixed: 4

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Independent Study, Laboratory
Grade Roster Component Laboratory
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites Biology 1113/1113H, Biology 1114/1114H, sophomore or higher standing, or permission of the instructor
Exclusions

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 26.0701
Subsidy Level Baccalaureate Course
Intended Rank Sophomore, Junior, Senior

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students will learn the principles of basic scientific research
- Students will learn how to contribute to new knowledge in behavioral ecology through hands-on activities in the laboratory
- Students will gain a greater understanding of interactions among organisms and their environment, as well as experimental evolution
- Students will be able to use basic statistics and data analyses tools
- Students will develop skills in public speaking by presenting their research

Content Topic List

- Introduction to Behavioral Ecology
- Research Methods in Behavioral Ecology
- Experimental Research Design
- Developing a Research Question
- Research Ethics, Plagiarism, Replication
- Experimental Evolution
- Laboratory Animal Care and Overview of Green House Experiments
- Graphical Presentation of Data and Elementary Statistical Analyses
- Preparing Poster Presentations

Attachments

- EEOB 3498 syllabus.doc: Syllabus
(Syllabus. Owner: Lanno,Roman P.)
- EEOB 3498 Curriculum Questions.docx: Response to committee questions
(Other Supporting Documentation. Owner: Lanno,Roman P.)

Comments

- The course number has been changed to EEOB 3498. The number of experimental lab hours has been increased from 2 to 3. The instructor has indicated that there is considerable time required outside lab and lecture preparing lab reports, manuscripts, and presentations so the 4-CH designation is probably warranted.

Dr. Benderlioglu's responses to the questions of the committee have been attached. *(by Lanno,Roman P. on 10/21/2013 02:24 PM)*

- See 9-24-13 e-mail to R Lanno. *(by Vankeerbergen,Bernadette Chantal on 09/24/2013 03:33 PM)*
- (1) The credit hours should be changed to 3. The syllabus describes 2 lecture hours and one 2-hour lab -- that should be 3 credits and not 4. This assumes that there is not a large independent effort for students to work in the lab (or greenhouse), beyond the times specified in the syllabus.

(2) Unsure of the most appropriate number for this course. I suggest that 3498 or 3998 might be better than 4494 as the "xx98" will allow a search for a research oriented course on SIS. *(by Hadad,Christopher Martin on 07/25/2013 04:03 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Lanno,Roman P.	07/23/2013 02:23 PM	Submitted for Approval
Approved	Lanno,Roman P.	07/23/2013 02:25 PM	Unit Approval
Revision Requested	Hadad,Christopher Martin	07/25/2013 04:03 PM	College Approval
Submitted	Lanno,Roman P.	08/23/2013 11:51 AM	Submitted for Approval
Approved	Lanno,Roman P.	08/23/2013 11:52 AM	Unit Approval
Approved	Hadad,Christopher Martin	08/23/2013 12:03 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	09/24/2013 03:33 PM	ASCCAO Approval
Submitted	Lanno,Roman P.	10/21/2013 02:24 PM	Submitted for Approval
Approved	Lanno,Roman P.	10/21/2013 02:26 PM	Unit Approval
Approved	Hadad,Christopher Martin	10/21/2013 03:59 PM	College Approval
Pending Approval	Vankeerbergen,Bernadette Chantal Nolen,Dawn Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole Hanlin,Deborah Kay	10/21/2013 03:59 PM	ASCCAO Approval

EEOB 3498 – UNDERGRADUATE RESEARCH IN BEHAVIORAL ECOLOGY
4 CREDIT HOURS
SPRING 2014

TENTATIVE SYLLABUS

Lecture: Tuesday 12:45 -2:05 pm – TBA
 Thursday 12:45-2:05 pm – TBA

Lab: Wednesday 12:45-3:40 pm - TBA

Instructor: Dr. Zeynep Benderlioglu

Office: 717 Biological Sciences Green Houses, 332 W. 12th Ave., Mailbox: AL 300, 318 W. 12th Ave.

Office Hours: By appointment

e-mail: benderlioglu.1@osu.edu

Phone: 614 292 5965

Prerequisites: Biology 1113/1113H, Biology 1114/1114H, sophomore or higher standing, or permission of the instructor

Textbook: There are no required textbooks for this course. All necessary course materials, lecture notes, articles, handouts, and folders to submit assignments will be available on CARMEN (<http://carmen.osu.edu/>).

Course Description

This course aims to provide opportunities for undergraduates to conduct supervised independent research in behavioral ecology. It is especially suitable for undergraduates who consider careers in basic scientific research, secondary education, and graduate research programs in biological and behavioral sciences. In line with the EEOB undergraduate program objectives, it is also designed to educate students on current questions in Evolutionary Biology, Experimental Evolution, and Behavioral Ecology with topical lectures and seminars. Students will be given formal instruction on experimental research design, literature review, research ethics, and elementary statistical analyses. They will then proceed with supervised independent research in behavioral ecology as part of the laboratory activities. At the end of the term, a student symposium will be organized. The students will prepare posters of their class projects for this symposium where faculty from various departments and peers will be present. The class projects include, but not limited to:

1. Aggression and dominance in field crickets and fruit flies
2. Stress and dental development in orangutans
3. Maternal stress and offspring behavior in earwigs

Learning Objectives:

- a. Students will learn the principles of basic scientific research
- b. Students will learn how to contribute to new knowledge in behavioral ecology through hands-on activities in the laboratory
- c. Students will be able to use basic statistics and data analyses tools
- d. Students will develop skills in public speaking by presenting their research results
- e. Students will gain a greater understanding of interactions among organisms and their environment, as well as experimental evolution

Course Website: <https://carmen.osu.edu/>

The address printed here will bring you to the login page for Carmen. If you are unfamiliar with CARMEN, instructions are available at the Center for Life Sciences Education office (260 Jennings Hall).

Electronic Communication: Students are welcome and encouraged to e-mail the instructor. Course updates and other course related communication will be posted on CARMEN and will be distributed as a course-wide email to all name.#'s registered for the course. It is expected that all students will check their e-mail and CARMEN web site regularly for updates, lecture notes, hands-out and assignments.

Evaluation

Students are expected to **actively** participate in all class lectures, seminars, and experiments to get full credit. If you miss three scheduled experimental sessions, your grade will be an **E**. See course policies below as to what constitutes a legitimate excuse for absences. Students are expected to come back to the lab sessions at their own scheduled time to finish experiments and data collection. These times will be arranged during the semester. Students are also expected to work in groups of two emphasizing the importance of collaboration in any scientific work. Students must keep a laboratory notebook where they carefully write down experimental procedures and keep their data collection up-to-date. This log will be collected and graded as part of the grade in course participation. Each student in the group must keep their own individual copy.

The grades will be assessed according to the following scheme:

1. Participation (35 points)

Includes attendance, active participation, timely submission of the research topic, regular transfer of data to lab computers, the resultant data sheets, and keeping a proper notebook

2. Poster Presentation (65 points)

a. E-copy of the Poster (50 points)

b. Poster Presentation (15 points)

Total: 100 points

Grade Scale: Your final grade will be based on the following scale:

94-100	A
90-93	A-
87-89	B+
84-86	B
80-83	B-
77-79	C+
74-76	C
70-73	C-
67-69	D+
60-66	D
59 and Below	E

There are no extra credits. However, adjustments to the individual grades may be made if the instructor determines that a student's contribution to group work and/or poster presentation is not equal. Course policies regarding the assignments are outlined below.

Course Policies

Late Assignments: It is extremely important that you follow the deadlines. Failure to deliver your notebook, or show up for your presentation will result in **0 points** for the subject assignment. If you were too ill to complete an assignment, you are required to contact me within 24 hours of the class period in which the assignment was due. You must provide written documentation from a medical unit regarding the illness covering the assignment period. If you had other excuses that are personal in nature, I will consider those on an individual basis. I will reserve the right to decide what constitutes a "legitimate excuse." Lack of transportation, travel to sports, or family events are not considered legitimate excuses. You are given ample time for preparing a proposal and flexibility in scheduling your presentation. Please plan accordingly.

Codes of Conduct in Class: This class involves interactive hands-on activities with laboratory animals and in-class discussions. Therefore, please consider the following:

- Be on time. Late arrivals and early departures are very disruptive, especially if we have a seminar speaker or your partner is waiting for you to run experiments.
- Be respectful of the animals you are working with.
- Turn off your cell phone, beeper, smartphone, and any other device that you text, or listen to. Use of such devices is strictly prohibited in class.

Class participation: Attendance and participation in class and recitation hours are essential to succeed in this course. There are no exams. Accordingly, through participation, hands-on training in the laboratory, observation of your peers presenting in class, critiquing scientific work, and listening to guest speakers will equip you to become independent researchers in your own right. To emphasize this point attendance is worth 35 percent of the total grade. If you miss three experiment sessions/data collection activities, your grade will be assessed as an **E** in this class.

Grade Inquiries: Grades will be posted to the course site on Carmen. You will have 14 days from the date the grade is posted to challenge any grade or inquire about a missing grade; after that time the grade becomes final, no exceptions.

Miscellaneous items:

Food and drink: Food and drink are strictly prohibited in the laboratory

Cell phones: All electronic devices must be turned off during class. No calls, no texts, no earpieces are allowed, and please keep the web-surfing to a minimum if you use your laptop for notes.

University Policies

Students with Disabilities: If you have any special needs, you should meet with me within first week of class to arrange for provisions to ensure an equitable opportunity to meet all requirements of this course. Accommodations require special approval by the Disability Services. Check the web site below for further information: <http://ods.osu.edu/>

Academic Integrity (Academic Misconduct):

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination.

If I, or any other instructor, suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If the COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include, and are not limited to, a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. If you have any general questions concerning academic integrity, please refer to the following web site: <http://oaa.osu.edu/coam.htm>

Sexual Harrassment: While your instructor has been trained in OSU sexual harassment policies and procedures, this may not be true for staff and is not generally true for OSU students. Please report any concerns about questionable or unwanted behavior that has the purpose or effect of unreasonably interfering with an individual's work or academic performance, or creates an intimidating, hostile, or offensive environment for working, learning, or living on campus to your course instructor or the Office of the Dean.

University Escort Service: To promote safety on campus, transportation across campus is offered by the OSU Department of Public Safety. Service is available between 7:30pm and 2:40am. Call 292-3322 to

schedule a pick-up. You must provide at least one hour notice. See the web link below for further information. http://dps.osu.edu/emergency_procedures/index.php?level=14

Errors & Omissions: This syllabus may be altered in the event that guest speaker, student schedules change, and animal deliveries are not made on time by the vendor. Corrected versions will be posted on CARMEN.

Weekly Schedule

Week	Date	Lecture	Readings/Homework Assignment
1	T Jan 7	Introduction to Behavioral Ecology	Lecture 1 Notes
	R Jan 9	Research Methods in Behavioral Ecology	Lecture 2 Notes
2	T Jan 14	Experimental Research Design	Lecture 3 Notes
	R Jan 16	Experimental Design Cont'd	Lecture 4 Notes
3	T Jan 21	Developing a Research Question	Lecture 5 Notes

	R Jan 23	Research Ethics, Plagiarism, Replication	Lecture 6 Notes
4	T Jan 28	Topics in Evolutionary Biology: Experimental Evolution	Lecture Notes 7
	R Jan 30	Guest Speaker (Evolutionary Biology): TBA	TBA
5	T Feb 4	Laboratory Animal Care: Insectary Visit	<i>Research Topics Due</i>
	R Feb 6	Overview of Green House Experiments	
6	T Feb 11	Groups are Formed and Experiments Begin	
	R Feb 13	Data Collection	<i>Transfer of Data to Lab Computers</i>
7	T Feb 18	Data Collection	<i>"</i>
	R Feb 20	Data Collection	<i>"</i>
8	T Feb 25	Data Collection	<i>"</i>
	R Feb 27	Data Collection	<i>"</i>
9	T Mar 4	Data Collection	<i>"</i>
	R Mar 6	Data Collection	<i>"</i>
10	T Mar 11	Data Collection	<i>"</i>
	R Mar 13	Data Collection	<i>"</i>
11	T Mar 18	Data Collection	<i>"</i>
	R Mar 20	Topics in Ecology	Lecture 22 Notes
12	T Mar 25	Topics in Evolution of Behavior	Lecture 23 Notes
	R Mar 27	Guest Speaker (Behavioral Ecology): TBA	TBA
13	T Apr 1	Graphical Presentation of Data	<i>Data Sheets Due</i>
	R Apr 3	Elementary Statistical Analyses	
14	T Apr 8	Statistics Cont'd	
15	R Apr 10	Preparing Poster Presentations	
	T Apr 15	Graduate School Applications/Career Paths	
16	R Apr 17	Poster Symposium	<i>Poster Presentations</i>
17	W Apr 23	Final Posters	<i>Revised E-copy of Posters Due at 2 pm</i>

- The course is an independent study with assigned lab time. This is a bit confusing. Request to clarify.

The description above is not accurate. There is significant amount of formal instruction during assigned class times. The course aims to prepare students to become independent researchers in their own right. It is designed to train them mainly in laboratory and secondarily in field research- be it experimental, quasi-experimental, correlational, descriptive, survey-type, or observational. Formal instruction also includes literature review, basic statistics (see below), graphical representation of data, poster presentation, topical lectures encompassing ecology, evolution and behavior, and research ethics. The students who have taken this course will be offered independent study credit to continue their work in the laboratory in the forthcoming terms. This option will constitute an independent study course with assigned lab time.

- Panel believes this should be a 3-cr hr course. If unit wants course to be 4 credits, clear justification is needed. See credit hour explanation on Ohio Board of Regents' website:
<https://www.ohiohighered.org/calendar-conversion/definition> and
<http://regents.ohio.gov/actions/documents/2010/Dir2010-016.pdf>

As mentioned above, there is significant amount of formal instruction in the course. The class meets 3 times a week (335 minutes total per week) for a full term. The lectures and lab are intertwined and taught by the same instructor. During labs, the instructor is always present and students work in groups performing weekly tasks assigned for the projects. There is also significant amount of time spent outside of the classroom. The students are assigned significant amount of scientific articles for their group projects. They also have to perform literature searches to come up with their own research questions. There are several group projects where study subjects are either human or non-human animals. Those who work with human subjects need to go through an Institutional Review Board training and formal protocol writing. Those who work with non-human animals have to learn life histories, some organismal biology, and engage in animal care. Therefore, a 4-credit assignment to this course is appropriate.

- Provide clarification about how elementary statistical analysis is incorporated in the course.

In the second half of the term, an overview of the most commonly used statistical methods in experimental, quasi-experimental, correlational, observational, and survey designs will be presented. That is, an overview of both descriptive and inferential statistics will be given. A statistical package freely available to OSU students (SAS) will then be introduced to teach the necessary statistical tools to analyze data gathered during the term. Students will learn hypothesis testing, parametric and non-parametric tests relevant to their projects. A computer room in Jennings has been assigned to the course twice a week for computational access.