

1. General Information

1a. Submitted by the College of: ARTS & SCIENCES

Date Submitted: 1/25/2016

1b. Department/Division: Biology

1c. Contact Person

Name: Jennifer Osterhage

Email: jennifer.osterhage@uky.edu

Phone: 257-9322

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: BIO 525

2c. Full Title: Advanced Ecology

2d. Transcript Title:

2e. Cross-listing:

2f. Meeting Patterns

LABORATORY: 6

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: BIO 525 is intended to bring students with a baseline knowledge of ecology to a deeper understanding of and experience with the way that ecological studies are conceived, conducted, analyzed and interpreted. BIO 525 is a series of modules that introduce students to the field site and most basic methods and then to a set of research systems for which the group is challenged to come up with the study design, analysis, and interpretation. These modules will address important issues in contemporary ecology and will build on what students learned in previous undergraduate ecology courses.

2k. Prerequisites, if any: BIO 325 (Ecology) or equivalent.

2l. Supplementary Teaching Component:

3. Will this course taught off campus? Yes

If YES, enter the off campus address: The EREC field station, UK/Lexmark Building, 1737 Russell Cave Road

4. Frequency of Course Offering: Fall,

Will the course be offered every year?: Yes

If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 12

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: Yes

Will it be of interest to a significant number of students outside the degree pgm?: Yes

If Yes, explain: This course may be of interest to students in other life-science related programs such as Agriculture, Food, and Environment or Forestry.

8. Check the category most applicable to this course: Relatively New – Now Being Widely Established,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: Yes

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from 10.a above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1. How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2. How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3. How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4. Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5. How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6. How do course requirements ensure that students make appropriate use of learning resources?

7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8. How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (<http://www.uky.edu/UKIT/>)?

9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10. Does the syllabus contain all the required components? NO

11. I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

BIO 525 001
Advanced Ecology

Semester: Fall 2016

Meeting times: TR 1-4 PM

Course location: The EREC field station, UK/Lexmark Building, 1737 Russell Cave Road

Instructor: Philip Crowley

Office Address: 113 MDR3

Email: pcrowley@uky.edu

Office phone: 257-1996

Teaching Assistant: Jacqueline Dillard (jacqueline.dillard@uky.edu; 323-9499; 104 MDR3)

Office hours: Office visits are scheduled by e-mail

Course Description

BIO 525 is intended to bring students with a baseline knowledge of ecology to a deeper understanding of and experience with the way that ecological studies are conceived, conducted, analyzed and interpreted. BIO 525 is a series of field-based modules that introduce students to the field site and most basic methods and then to a set of research systems for which the group is challenged to come up with the study design, analysis, and interpretation. These modules will address important issues in contemporary ecology and will build on what students learned in previous undergraduate ecology courses.

Prerequisites

BIO 325 (Ecology) or equivalent.

Course Goals

- Build a deeper understanding of and experience with the way that ecological studies are conceived, conducted, analyzed and interpreted
- Introduce students to the field site and most basic methods
- Challenge students to come up with the study design, analysis, and interpretation of a set of research systems

Student Learning Outcomes

After completing this course, students will be able to:

1. Conceptualize and formulate research questions and testable hypotheses in each of several different ecological systems.
2. Implement a range of field methods that effectively address these questions and hypotheses.
3. Gather, analyze, and present data to facilitate their interpretation.
4. Distinguish between results per se and an appropriate interpretation of those results.
5. Structure the introduction, methods, results, and discussion sections of a scientific article.
6. Collaborate on research projects in small groups.

Required Materials

There is no required text or other materials.

Course Activities and Assignments

BIO 525 is a series of modules that introduce students to the field site and most basic methods and then to a set of research systems for which the group is challenged to come up with the study design, analysis, and interpretation. These modules will address important issues in contemporary ecology and will build on what students learned in previous undergraduate ecology courses. For most modules, students will read 2-3 papers before the first session, where these will be discussed as an introduction to the topic. Most of the additional work associated with the course will be done within the sessions themselves, but four of the modules will each have one additional writing assignment (see description below).

Course Grading Scheme

- Effort and skill in contributing to the group project goals - 50%

These will be assessed after sessions 9, 14, 19, 24, and 30, with each assessment counting 60 points toward a total of 300 possible points in this category. Students may differ in how they contribute to the group effort—through ad-hoc leadership and organizational skills, assisting with whatever physical labor or calculations are needed, articulating the issues and the results associated with each exercise, providing a broad perspective on the findings and relationships to other studies and potential future studies. Contributions needed will differ among exercises, but commitment and positive attitude will go a long way. Students are entitled to a critique on their contributions at any point during the course.

- Contributions to group discussions - 30%

This will be assessed weekly, with 15 weeks x 12 possible points per week (4 criteria x 3 points per criterion) = 180 possible points of discussion credit.

- Writing assignments - 20%

Students will choose four of the five major group topics and write a different manuscript section for each of those chosen (one introduction, one methods, one results, one discussion), 30 possible points per assignment = 120 possible points of writing credit. Primary criteria for evaluation include clarity, relevance, organization, identifying and explaining the main points, and insightfulness.

Description of Course Assignments

Students putting out strong effort on the projects, discussions, and writing assignments, and who attend all labs should do very well.

Contributions to group projects: Students are expected to contribute the study design, analysis, and interpretation of field experiments.

Contributions to group discussions: Students are expected to prepare for group discussions by reading 2-3 primary literature articles and contribute to the analysis of these articles in group discussion. The rubric for assessing participation is included on the last page of this syllabus.

Writing assignments: Following class discussion of the assignment topic, students will write a specified section of a short manuscript on the project (i.e. an introduction, a methods section, results, or discussion). Each write-up will be limited to five double-spaced pages presented in standard scientific style.

Course Grading

Grading scale for undergraduates:

- 90 – 100% = A
- 80 – 89% = B
- 70 – 79% = C
- 60 – 69% = D
- Below 60% = E

Grading scale for graduate students (no D for Grad Students):

- 90-100% = A
- 80 – 89% = B
- 70 – 79% = C
- Below 70%= E

Expectations for Graduate Students beyond the expectations for undergraduates

Graduate students will pick one of the exercises to write up in full manuscript form, including Introduction, Methods, Results, Discussion, and References Cited. The manuscript should be about 12 double-spaced pages of text, including at least one figure illustrating results. The criteria for evaluation are the same as those for the regular one-section writing assignments. The format will closely follow that of the journal *Ecology*. 10% of the final grade for graduate students will come from the 4 sections of the manuscripts expected of all students in the course. 10% of the final grade will come from the full manuscript.

Tentative Course Schedule

<u>Session</u>	<u>Date</u>	<u>Topic/System</u>	<u>Read in Advance</u>
1	August 25	Introduction: Tour of EREC/ERF	
2	August 30	Introduction: Excel, JMP, NetLogo, box-and-arrow models	
3	September 1	Discuss papers, plan for mosquito monitoring	8, 10
4	September 6	Implement monitoring, intro to the weather station	
5	September 8	Succession/insect diversity 1: Papers, study design	12, 14
6	September 13	2: Sampling and beginning the key-out	
7	September 15	3: Sampling and key-out	
8	September 20	4: Finish the key-out, record data, analysis set-up	
9	September 22	5: Conduct analysis, graph/interpret results, discuss follow-up	
10	September 27	Bees and NetLogo 1: Discuss NetLogo tutorials, run bee model	15 (p 1-64)
11	September 29	2: Discuss papers, design the study, plan the analysis	3, 4, 5
12	October 4	3: Gather data, enter the data into an Excel file	
13	October 6	4: Gather data, enter the data into an Excel file	
14	October 11	5: Conduct analysis, graph/interpret results, discuss follow-up	
15	October 13	Pond sucrose experiment 1: Papers, background, design	1,7, 13
16	October 18	2: Take baseline measurements/samples, do the manipulation	
17	October 20	3: Take measurements/samples, sort samples	

18	October 25	4: Take measurements/samples, sort samples	
19	October 27	5: Measure/sample, sort samples, graph/analyze, discuss	
20	November 1	Crayfish 1: Discuss papers, develop study design	2,6
21	November 3	2: Sort/measure crayfish, store; correlate mosquitoes vs weather	
22	November 8	3: Initiate study, gather short-term data, enter data into Excel	
23	November 10	4: Gather data, enter the data into an Excel file	
24	November 15	5: Get/store data, analyze, graph/interpret the results, discuss	
25	November 17	Invasive plants 1: Discuss papers, introduction to GIS	9, 11
26	November 22	2: Design the study, set up and take initial data	
27	November 29	3: Continue data gathering, initiate removal plots	
28	December 1	4: Complete the removal plots, set up long-term study	
29	December 6	5: Complete the plots and GIS mapping, discuss	
30	December 8	General discussion, critique, brainstorming for the future	

Final Exam Information

There will be no final exam in this course.

Mid-term Grade

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/registrar/calendar>). Students can ask the instructor about their current standing at any point during the term.

Submission of Assignments

Written assignments must be submitted within one week of the assignment. No late work will be accepted.

Dress Code

Students must dress for field work regardless of the weather; field shoes/boots, jeans, and long-sleeve shirt are required. Be sure to recognize (and avoid) poison ivy!

Attendance Policy

Attendance is required; each missed lab without an acceptable excuse and proper documentation (see below) will reduce the total grade by 5%.

Excused Absences

Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

Verification of Absences

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

Decorum and Civility

Students are expected to respect their peers and instructors in this course. No disruptive behavior will be tolerated. Significant breaches of these principles will be referred to the Dean of Students.

Accommodations due to disability

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.

Academic Integrity

Plagiarism is easy to detect, a thoroughly bad idea, and wrong. At best it will get you an E in the course. Don't go there. University rules, including the Student Code of Conduct, apply. To make sure you're clear on what plagiarism is, take the quiz at this url and send the certificate of completion to Jacqueline within the first week of classes: <https://www.indiana.edu/~istd/test.html>

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Senate Rules 6.3.1 (see <http://www.uky.edu/Faculty/Senate/> for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Classroom Civility and Decorum

The university, college and department all have a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right -- and the responsibility -- to ensure that all academic discourse occurs in a context characterized by respect and civility. The accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.

Readings

1. Brown, J.H., and J.C. Munger. 1985. Experimental manipulation of a desert rodent community: Food addition and species removal. *Ecology* 66: 1545-1563.
2. Bryan, S.D., A.T. Robinson, and M.G. Sweetser. 2002. Behavioral responses of a small native fish to multiple introduced predators. *Environmental Biology of Fishes* 63: 49-56.
3. Chittka, L., A.G. Dyer, F. Bock, and A. Dornhaus. 2003. Bees trade off foraging speed for accuracy. *Nature* 424: 388.
4. Ginsberg, H.S. 1983. Foraging ecology of bees in an old field. *Ecology* 64: 165-175.
5. Grüter, C., H. Moore, N. Firmin, H. Helanterä, and F.L.W. Ratneiks. 2011. Flower constancy in honey bee workers (*Apis mellifera*) depends on ecologically realistic rewards. *The Journal of Experimental Biology* 214: 1397-1402.
6. Guan, R.-Z., and P.R. Wiles. 1997. Ecological impact of introduced crayfish on benthic fishes in a British lowland river. *Conservation Biology* 11: 641-647.
7. Hall, D.J., W.E. Cooper, and E.E. Werner. 1970. An experimental approach to the production dynamics and structure of freshwater animal communities. *Limnology and Oceanography* 15: 839-928.
8. Juliano, S.A., and L.P. Lounibos. 2005. Ecology of invasive mosquitoes: effects on resident species and on human health. *Ecology Letters* 8: 558-574.
9. Naito, A.T., and D.M. Cairns. 2011. Patterns and processes of global shrub expansion. *Progress in Physical Geography* 35: 423-442.
10. Rey, J.R., and S.M. O'Connell. 2014. Oviposition by *Aedes aegypti* and *Aedes albopictus*: Influence of congeners and of oviposition site characteristics. *Journal of Vector Ecology* 39: 190-196.
11. Shields, J.M., M.A. Jenkins, M.R. Saunders, H. Zhang, L.H. Jenkins, and A.M. Parks. 2014. Age distribution and spatial patterning of an invasive shrub in secondary hardwood forests. *Forest Science* 60: 830-840.
12. Siemann, E., J. Haarstad, and D. Tilman. 1999. Dynamics of plant and arthropod diversity during old field succession. *Ecography* 22: 406-414.
13. Simberloff, D.S., and E.O. Wilson. 1969. Experimental zoogeography of islands: The colonization of empty islands. *Ecology* 50: 278-296.
14. Steffan-Dewenter, I., and T. Tschardt. 2001. Succession of bee communities on fallows. *Ecography* 24: 83-93.
15. Wilensky, U. 2014. NetLogo User Manual. Center for Connected Learning, Northwestern U.

Rubric for Evaluation of Class Participation

Performance Elements or Criteria	Inadequate (0 point)	Developing but below expectations (1 points)	Accomplished/ Meets Expectations (2 points)	Exemplary/Displays leadership (3 points)	Score
Level of Engagement and active participation	Student never contributes to class discussion; fails to respond to direct questions	Few contributions to class discussion; Seldom volunteers but responds to direct questions	Proactively contributes to class discussion, asking questions and respond to direct questions	Proactively and regularly contributes to class discussion; Initiates discussion on issues related to class topic	
Listening Skills	Does not listen when others talk, interrupts, or makes inappropriate comments	Does not listen carefully and comments are often nonresponsive to discussion	Listens and appropriately responds to the contributions of others	Listens without interrupting and incorporates and expands on the contributions of other students	
Relevance of Contribution to topic under discussion	Contributions , when made, are off-topic or distract class from discussion	Contributions are sometimes off-topic or distracting	Contributions are always relevant	Contributions are relevant and promote deeper analysis of the topic	
Preparation	Student is not adequately prepared; Does not appear to have read the material in advance of class	Student has read the material but not closely or has read only some of the assigned material in advance of class	Student has read and thought about the material in advance of class	Student is consistently well-prepared; Frequently raises questions or comments on material outside the assignment	