

Term Information

Effective Term Summer 2020
Previous Value Summer 2012

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Remove EEOB 3410 as a prerequisite

Add Biology 1114 or 1114H as a prerequisite

What is the rationale for the proposed change(s)?

Many students do not take EEOB 3410 until the summer, fall, or spring of their senior year. When EEOB 3410 is a prerequisite, it excludes many students from having the opportunity of taking EEOB 4430. We can accommodate students who have not yet had EEOB 3410, but have some background in ecology through Biology 1114, by providing background materials/presentations on the content and skills necessary to engage successfully with the EEOB 4430 learning activities.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

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 4430
Course Title Ecological Methods I
Transcript Abbreviation Ecol Methods 1
Course Description Hands-on course for learning basic field and quantitative methods for ecological studies.
Semester Credit Hours/Units Fixed: 2
Previous Value Variable: Min 1 Max 2

Offering Information

Length Of Course 4 Week
Flexibly Scheduled Course Sometimes
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable Yes
Allow Multiple Enrollments in Term No
Max Credit Hours/Units Allowed 8
Max Completions Allowed 4
Course Components Field Experience, Laboratory
Grade Roster Component Laboratory

Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Sometimes
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: Biology 1114 or Biology 1114H
Previous Value	Prereq: 3410.
Exclusions	
Electronically Enforced	Yes
Previous Value	No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.1301
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

- Understand how ecologists use the scientific method.
- Understand the difference between using observational and experimental approaches to understanding nature.
- Appreciate how models are used to understand nature.
- Learn the need for, meaning of, and use of statistics as a tool to understand nature.
- Understand what factors and processes affect population size, structure, and growth rate.
- Understand how interactions among species and among species and the environment affect community structure & function.
- Appreciate the role of global processes in ecology.
- Understand and value the difference between appraisals based upon the scientific method and values-based appraisals.

[Previous Value](#)

Content Topic List

- Process of ecological inquiry (interplay between observations, models, and lab/field experiments)
- Experimental design in ecology (with consideration of large-scale designs)
- Estimating abundance of plants and animals (mark-recapture, depletion, transects, quadrats)
- Community metrics (similarity, diversity, niche overlap)
- Sampling design and methods in ecology
- Ecological data management (with introduction to software such as Access)
- Statistics in ecology
- Data visualization (with introduction to graphing software such as SigmaPlot)

Sought Concurrence

No

Attachments

- EEOB 4430_Ecol Methods I_SYLLABUS_MAY2020 DRAFT with schedule.docx: Revised Syllabus
(Syllabus. Owner: Hamilton,Ian M)
- EEOB 4430_Ecol Methods I_SYLLABUS_MAY2016.pdf: Previous Syllabus
(Syllabus. Owner: Hamilton,Ian M)
- EEOB Curriculum Maps August 2019.xlsx: Curriculum maps
(Other Supporting Documentation. Owner: Hamilton,Ian M)

Comments

- Course credits have been changed to fixed, 2 credit hours on curriculum.osu.edu and on the curriculum maps *(by Hamilton,Ian M on 09/11/2019 12:28 PM)*
- See 9-9-19 email to I. Hamilton *(by Oldroyd,Shelby Quinn on 09/09/2019 06:03 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Hamilton,Ian M	06/21/2019 11:15 AM	Submitted for Approval
Approved	Hamilton,Ian M	06/21/2019 11:15 AM	Unit Approval
Approved	Haddad,Deborah Moore	06/21/2019 11:28 AM	College Approval
Revision Requested	Oldroyd,Shelby Quinn	09/09/2019 06:03 PM	ASCCAO Approval
Submitted	Hamilton,Ian M	09/11/2019 12:29 PM	Submitted for Approval
Approved	Hamilton,Ian M	09/11/2019 12:29 PM	Unit Approval
Approved	Haddad,Deborah Moore	09/11/2019 01:41 PM	College Approval
Pending Approval	Vankeerbergen,Bernadette Chantal Oldroyd,Shelby Quinn Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	09/11/2019 01:41 PM	ASCCAO Approval

EEOB 4430 – Ecological Methods I

Instructors: Prof. Libby Marschall (marschall.2@osu.edu), 614-292-8767

Credits: 2 credits

Meeting time: May 6 – June 1 (no class May 25), MWF 9:00AM – 1:30PM*
*IMPORTANT: Some days we will meet earlier and/or go later (see schedule for details)

Locations*: Jennings Hall 130
Museum of Biological Diversity (MBD) - 1315 Kinnear Rd
Aquatic Ecology Laboratory (AEL) – 1314 Kinnear Rd.
Various field sites off-campus (see schedule for details)
*IMPORTANT: Be sure to check the schedule before each class to confirm the location and time. Missing an activity because you went to the wrong location or did not remember we were meeting earlier is not a valid excuse.

Transportation: For field trips outside of Columbus, we will arrange OSU transportation for the class. If you would prefer to drive separately, please let us know as soon as possible. We will use CABS for field trips on campus.

Office hours: By appointment

Textbook: (K&H) Karban & Huntzinger. 2006. *How to Do Ecology – A Concise Handbook*. Princeton University Press.

Other resources: You must be able to access this course via Carmen (<https://carmen.osu.edu/>), as we will be sharing materials and assignments, as well as important notifications, through this site. You will also need to download the following statistical software: JMP (available through OCIO and free to students) and R Studio (freeware available at <https://www.rstudio.com/> NOTE: that you will also need to install R in order to use the Studio interface. Directions are available at the link above). Both of these products run on Mac and Windows platforms.

Course Learning Objectives: Students who successfully completes this course should be able to:

Understand how ecology is done:

- Understand how ecologists use the scientific method.
- Understand the difference between using observational and experimental approaches to understanding nature.
- Appreciate how models are used to understand nature.
- Learn the need for, meaning of, and use of statistics as a tool to understand nature.

Have knowledge of ecological concepts and connections:

- Have a basic understanding of what factors and processes affect population size, structure, and growth rate.
- Understand how interactions among species and among species and the environment affect community structure & function.
- Appreciate the role of global processes in ecology.

Appreciate linkages between human actions and the environment:

- Understand and value the difference between appraisals based upon the scientific method and values-based appraisals.

These goals will be accomplished through in-class discussions, workshops and lectures; assigned readings and reading assessments; hands-on demonstrations and data collection in the field; and written and oral presentations of project results.

Attire & Equipment: We will be outdoors for some classes. Outside activities will take place rain or shine, so please plan accordingly and dress appropriately (i.e. long pants, hat, sunblock, raincoat, umbrella, sneakers or hiking boots). Please bring sufficient water and snacks (or lunch, on longer days).

You will need a notebook in which to take field notes. Make sure you get something sturdy that will stand up through a variety of weather conditions. We will provide all field guides, but feel free to bring your own if you have any.

Grading: The course grade will be out of a total of 1000 points, which will be divided into three main categories:

Comprehensive Research Project. – 425 points total. We will do one ecology experiment from start to finish, beginning with developing hypotheses, and working through setting up the experiment, collecting data, analyzing results, and writing a final report. These points will add up over the course of the term as you complete separate pieces of the project.

Readings Assessments – 200 points total

Reading assignments will include chapters from the textbook (K&H), background reading for in-class activities, and articles from scientific journals. For each reading, there will be a short reading assessment or related assignment.

In-class Activities – 375 points total

The following grading scale will be used to determine the final grade you have earned:

≥93%=A; 90-92%=A-; 87-89%=B+; 83-86%=B; 80-82%=B-; 77-79%=C+; 73-76%=C; 70-72%=C-; 60-69%=D; ≤59%=E

Attendance and Late Policy: Learning in this course will be achieved mainly through hands-on activities in class, and a large portion of the grade will be based on in-class activities, therefore attendance is mandatory. If you miss a class for a valid reason (i.e. an “excused absence” as defined by OSU), please provide documentation and let us know as soon as possible so that we can work with you on how to make up the work. *A missed, excused, class must be made up within 5 days (includes weekends) from when it was missed.*

Anyone missing three classes for reasons other than those deemed appropriate by university rules will be assigned a grade of E for the entire course, regardless of points accumulated.

Unexcused Late Assignment Penalty: There is a 10% per day penalty for late assignments up to 5 days (*includes weekends*) and after 5 days the grade for the assignment will be an automatic zero.

Cooperative Learning Expectations: We will conduct some components of this course with cooperative learning groups. Group formation is not haphazard; we consider whole-semester, whole-course goals in making group assignments. We value the opportunity such groups provide to present and to consider

alternative viewpoints. While such groups generally facilitate learning, they do depend upon basic communication and social skills of participants. Please discuss any questions or concerns you may have with us about these issues.

Diversity Statement: The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Disability Services: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Mental Health: As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:614-292-5766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:614-292-5766) and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Sexual Misconduct/Relationship Violence: Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

SCHEDULE

Date/Time	Site	Topics	Methods and Activities	Work Due at end of class	Homework Due ¹ before this class
May 6 Wednesday 9:00-1:30	JE130 ²	Course introduction Data visualization and statistical methods Generating and testing ecological hypotheses	Hypothesis activity – community assembly Intro to using Excel, JMP, and R Regression/ANOVA	Final hypotheses submitted Completed graphs and statistical analysis	
May 8 Friday 9:00-1:30	AEL ³	Approaches to ecological research Community assembly in temporary ponds Using vertebrates in ecological research	Introduction to concepts Set up aquatic insect oviposition study Ecology in the News	Laboratory notebook inputs completed	K&H ⁴ Chapters 1, 2 assessment <i>Reading on community assembly in temporary ponds</i> (TBD)
May 11 Monday 9:00-1:30	ORWRP ⁵	Forest plant communities	Transects and sample plots Pawpaw effects in understory: field survey and analysis Ecology in the News	Complete pawpaw data and analysis	K&H Chapter 3, 4 assessment Baumer & Runkle ⁶ 2010 assessment
May 13 Wednesday 9:00-1:30	JE 130	River continuum concept Pollination ecology	Introduction to content Exploration of pollination ecology Pollinator field observations	Presentation of observation results and interpretation to class	Vannote et al. ⁷ 1980 assessment K&H Chapter 5 assessment

¹ All online submissions are due by 11:59 p.m. the day before class

² Jennings Hall 130

³ Aquatic Ecology Laboratory, 1314 Kinnear Rd.

⁴ Karban & Huntzinger. 2006. *How to Do Ecology – A Concise Handbook*. Princeton University Press

⁵ Schiermeier Olentangy River Wetland Research Park, direction at https://senr.osu.edu/Come_to_Schiermeier

⁶ Baumer & Runkle. 2010. Tree Seedling Establishment under the Native Shrub, *Asimina triloba*. *Castanea*, 75: 421-432.

⁷ Vannote et al. 1980. The river continuum concept. *Canadian journal of fisheries and aquatic sciences*, 37: 130-137.

Date/Time	Site	Topics	Methods and Activities	Work Due at end of class	Homework Due ¹ before this class
May 15 Friday <u>9:00 – 6:00</u>		Ordination River continuum concept	<u>OFF-CAMPUS, ALL-DAY FIELD TRIP</u> Plant community transect sampling Stream/river sampling Identification of stream invertebrates	Forest community data and photographs Preserved samples of aquatic invertebrates	Field trip intro article (TBA) assessment
May 18 Monday 9:00-1:30	AEL	Literature searches in ecological research Data collection and management	Using literature search engines and bibliographic software: oviposition experiment Sample oviposition experiment	List of ten articles from primary literature Laboratory notebook inputs	K&H Chapter 6 assessment
May 20 Wednesday 9:00-1:30	JE 130	Processing field samples in the laboratory Preparing data for statistical analysis Providing peer review	Stream invertebrate sample processing and data generation Analysis of stream invertebrate data Analysis of forest community data	Laboratory notebook inputs Figures and statistics from analyses	Five annotated literature sources Introduction to Oviposition Experiment research paper
May 22 Friday 9:00-1:30	MBD ⁸	Phenology & climate change Using natural history collections in ecology research	MBD tour Butterfly phenology using iDigBio Ecology in the News	Completed phenology exercise	Callinger et al. ⁹ 2013 assessment Kharouba & Veland ¹⁰ 2015 Assessment

⁸ Museum of Biological Diversity, 1315 Kinnear Rd.

⁹ Callinger, Queenborough, & Curtis. 2013. Herbarium specimens reveal the footprint of climate change on flowering trends across north-central North America. Ecology Letters 16:1037-44

¹⁰ Kharouba & Veland M. 2015. Flowering time of butterfly nectar food plants is more sensitive to temperature than the timing of butterfly adult flight. Journal of Animal Ecology 88:1311-1321.

Date/Time	Site	Topics	Methods and Activities	Work Due at end of class	Homework Due¹ before this class
May 25 Monday <i>Memorial Day</i>	NO CLASS				Peer review of paper introduction due by 9:00 p.m.
May 27 Wednesday 9:00-1:30	AEL	Presenting research results: research papers and research talks	Introduction to research presentations Sample and take down oviposition experiment Organize experimental data	All data from oviposition experiment	
May 29 Friday 9:00-1:30	AEL	Community assembly in temporary ponds	Presentation and discussion of draft oviposition experiment results Collaborative, student-led workshop on finalizing data analysis and interpretation	Final graphs, statistical results, and interpretation of oviposition experiment	Completed first-draft of graphs, statistical analysis, and interpretation of oviposition experiment
June 1 Monday 9:00–1:30	JE 130	Succession	Introduction and discussion of content Succession data analysis workshop	Completed succession analysis output and discussion	Teegalapalli & Datta 2016 Full research paper due

EEOB 4430 – Ecological Methods I

Instructors: Dr. Maria Miriti (miriti.1)
Ryan McCarthy (mccarthy.224)

Credits: 2 credits

Meeting time: May 11 – June 6 (no class May 26), MWF 9:00AM – 1:30PM*
*IMPORTANT: Some days we will meet earlier and/or go later (see schedule for details)

Locations*: Jennings Hall 130
Museum of Biological Diversity (MBD) - 1315 Kinnear Rd
Various field sites off-campus (see schedule for details)
*IMPORTANT: Be sure to check the schedule before each class to confirm the location and time. Missing an activity because you went to the wrong location or did not remember we were meeting earlier is not a valid excuse.

Transportation: For field trips outside of Columbus, we will arrange OSU transportation for the class. If you would prefer to drive separately, please let us know as soon as possible. We will use CABS for field trips on campus.

Office hours: By appointment

Textbook: (K&H) Karban & Huntzinger. 2006. *How to Do Ecology – A Concise Handbook*. Princeton University Press.

Other resources: You must be able to access this course via Carmen (<https://carmen.osu.edu/>), as we will be sharing materials and assignments, as well as important notifications, through this site. You will also need to download the following statistical software: JMP (available through OCIO and free to students) and R Studio (freeware available at <https://www.rstudio.com/> NOTE: that you will also need to install R in order to use the Studio interface. Directions are available at the link above). Both of these products run on Mac and Windows platforms.

Course goals: The course goals are for students to (1) be exposed to and understand general ecological theory and principles, (2) understand the scientific method and how it is employed in ecological research, and (3) become familiar with a sample of ecological methods used to collect data in the field, and the statistical approaches used to make inferences from these data. These goals will be accomplished through in-class discussions, workshops and lectures; assigned readings and reading assessments; hands-on demonstrations and data collection in the field; and written and oral presentations of project results.

Attire & Equipment: We will be outdoors for some classes. Outside activities will take place rain or shine, so please plan accordingly, and dress appropriately (i.e. long pants, hat, sunblock, raincoat, umbrella, sneakers or hiking boots). Please bring sufficient water and snacks (or lunch on longer days).

You will need a notebook in which to take field notes. Make sure you get something sturdy that will stand up through a variety of weather conditions. We will provide all field guides, but feel free to bring your own if you have any.

Grading: The course grade will be out of a total of 1000 points, which will be divided into three main categories:

Research projects – 600 points total. Your research grade will be determined from 1) written reports for two of the three data sets collected during the Hocking Hills field trip (Stream Invertebrates **Mandatory**, and your choice of Ordination or Succession), 2) a project summary and statistical analyses for **all three data sets**, and 3) an oral research presentation.

Project summary (3) – 25 points each

Data analysis (3) – 50 points each

Written report (2) – 150 points

Oral presentation (1) – 75 points

Readings Assessments – 200 points total

Reading assignments will include chapters from the textbook (K&H), background reading for in-class activities, and articles from scientific journals. For each reading, there will be a short reading assessment or related assignment.

In-class Activities – 200 points total

The following grading scale will be used to determine the final grade you have earned:

≥93%=A; 90-92%=A-; 87-89%=B+; 83-86%=B; 80-82%=B-; 77-79%=C+; 73-76%=C; 70-72%=C-; 60-69%=D; ≤59%=E

Attendance and Late Policy: Learning in this course will be achieved mainly through hands-on activities in class, and a large portion of the grade will be based on in-class activities, therefore attendance is mandatory. If you miss a class for a valid reason (i.e. an “excused absence” as defined by OSU), please provide documentation and let us know as soon as possible so that we can work with you on how to make up the work. *A missed, excused, class must be made up within 5 days (includes weekends) from when it was missed.*

Anyone missing three classes for reasons other than those deemed appropriate by university rules will be assigned a grade of E for the entire course, regardless of points accumulated.

Unexcused Late Assignment Penalty: There is a 10% per day penalty for late assignments up to 5 days (*includes weekends*) and after 5 days the grade for the assignment will be an automatic zero.

Diversity Statement: We are committed to promoting a welcoming climate for all students. We welcome suggestions, questions and comments about any element of this class, including issues relating to exchanges among students during course activities. Any conversations with us about diversity issues will be conducted with confidentiality, safety and respect and within university guidelines.

Cooperative Learning Expectations: We will conduct some components of this course with cooperative learning groups. Group formation is not haphazard; rather, we will aim to maximize heterogeneity (academic and demographic) in groups. We value the opportunity such groups provide to present and to consider alternative viewpoints. While such groups generally facilitate learning, they do depend upon

basic communication and social skills of participants. Please discuss any questions or concerns you may have with us about these issues.

Accommodation: Anyone who feels he/she may need an accommodation based on the impact of a disability or other special need should contact the instructors to arrange an appointment as soon as possible. At the appointment we can discuss the course format, anticipate your needs, and explore potential adaptations to meet your needs. We rely on the Office for Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the Office for Disability Services, we encourage you to do so.

Academic Misconduct: OSU has a strict code of academic misconduct that requires us to report any and all cases of suspected misconduct (e.g. cheating on an exam, plagiarism in written assignments, using an exam proxy, etc.) to the OSU Committee on Academic Misconduct for adjudication. We will adhere to this policy. For more information, go to <http://oaa.osu.edu/coam/faq.html>

Sexual Harassment: OSU considers sexual harassment offenses to be unacceptable behavior that destroys opportunities for learning. Please report any concern about questionable or unwanted behavior immediately to one of your instructors.