

## Term Information

Effective Term Spring 2021

## 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 Graduate, Undergraduate  
Course Number/Catalog 5350  
Course Title Evolutionary Ecology  
Transcript Abbreviation Evol Ecol  
Course Description This course explores the interactions among evolutionary and ecological patterns and processes, including evolutionary approaches to understanding life histories, reproductive and social behavior, host-pathogen, predator-prey and other interspecific interactions, evolutionary conservation biology and eco-evolutionary dynamics.  
Semester Credit Hours/Units Fixed: 3

## 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 Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Columbus

## Prerequisites and Exclusions

Prerequisites/Corequisites One of: EEOB 3310, EEOB 3310.01, EEOB 3310.02, EEOB 3420, EEOB 3420H or EEOB 3420E, or by permission of the instructor.  
Exclusions  
Electronically Enforced Yes

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code 26.1303  
Subsidy Level Doctoral Course  
Intended Rank Senior, Masters, Doctoral

## 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 understand the diversity of life history patterns, behaviors and intra- and interspecific interactions, and how these can be the result of natural, sexual and social selection
- Students will be able to develop and test hypotheses about the evolutionary causes and consequences of variation in life history, behavior and intra- and interspecific interactions.
- Students will be able to use mathematical and computational models to understand and predict the evolution of ecologically relevant traits
- Students will understand how evolutionary perspectives are used to understand how individuals, populations and species respond to anthropogenic change.

### Content Topic List

- Adaptation and selection
- Individual variation
- Life history theory
- Evolution and sexual reproduction
- Evolution and social behavior
- Interspecific interactions: microbial symbioses
- Interspecific interactions: mutualisms
- Interspecific interactions: pathogens and predators
- Evolutionary conservation biology
- Eco-evolutionary dynamics

### Sought Concurrence

Yes

## Attachments

- EEOB Curriculum Maps Feb 2020.xlsx: Curriculum maps  
*(Other Supporting Documentation. Owner: Hamilton, Ian M)*
- Evolutionary Ecology Syllabus 2021.docx  
*(Syllabus. Owner: Hamilton, Ian M)*
- Concurrence\_Form\_EEOB\_5350\_JB.pdf: Concurrence SENR  
*(Concurrence. Owner: Hamilton, Ian M)*

## Comments

- Concurrence requested from SENR *(by Hamilton, Ian M on 02/18/2020 01:50 PM)*

**COURSE REQUEST**  
5350 - Status: PENDING

Last Updated: Haddad,Deborah Moore  
02/18/2020

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Hamilton,Ian M	02/10/2020 12:58 PM	Submitted for Approval
Approved	Hamilton,Ian M	02/18/2020 01:50 PM	Unit Approval
Approved	Haddad,Deborah Moore	02/18/2020 02:48 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	02/18/2020 02:48 PM	ASCCAO Approval

**EEOB 5350: Evolutionary Ecology**

**Evolutionary Ecology  
EEOB 5350  
Spring 2021**

3 credit hours

Time: 9:35 to 10:55 AM, Tues and Thurs

Location: Campbell Hall 119

**Course overview**

This course explores the interactions among evolutionary and ecological patterns and processes, including evolutionary approaches to understanding life histories, reproductive and social behavior, host-pathogen, predator-prey and other interspecific interactions, evolutionary conservation biology and eco-evolutionary dynamics.

**Course Objectives**

- Students will understand the diversity of life history patterns, behaviors and intra- and interspecific interactions, and how these can be the result of natural, sexual and social selection
- Students will be able to develop and test hypotheses about the evolutionary causes and consequences of variation in life history, behavior and intra- and interspecific interactions.
- Students will be able to use mathematical and computational models to understand and predict the evolution of ecologically relevant traits
- Students will understand how evolutionary perspectives are used to understand how individuals, populations and species respond to anthropogenic change.

**Instructor**

Dr. Ian M Hamilton

390 Aronoff Lab

[hamilton.598@osu.edu](mailto:hamilton.598@osu.edu)

Dr. Gerald Carter

482 Aronoff Lab

[carter.1640@osu.edu](mailto:carter.1640@osu.edu)

**Meeting Times (Lecture)**

9:35 to 10:55 AM, Tues and Thurs

Office hours: 11 AM to 12 PM

**Prerequisites**

Students are required to have successfully completed one of EEOB 3310, EEOB 3310.01 or EEOB 3310.02 or to have completed EEOB 3420, 3420H or 3420E.

Exceptions to this will be granted at the discretion of the instructors.

**Required Text**

Assigned readings (available as PDFs posted to Carmen)

## **EEOB 5350: Evolutionary Ecology**

**Grading:** The total grade has the following components:

- 1 midterm exam consisting of short answer / multiple choice questions (20%)
- 1 final exam consisting of short answer / multiple choice questions (20%)
- Review – students will develop a proposal to test a hypothesis in the field of evolutionary ecology (total 25%)
  - Hypothesis development – 5%
  - Draft and peer review – 5 %
  - Final paper – 15%
- In class and take home exercises (5 assignments at 5% each. Total = 25%)
- Class preparation and participation (10%)

Grades will be assigned based on percentage of points earned: A (93-100); A- (90-92.9); B+ (87-89.9); B (83-86.9); B- (80-82.9); C+ (77-79.9); C (73-76.9); C- (70-72.9); D+ (67-69.9); D (60-66.9); E (59.9-0).

### ***Class organization***

Lecture material will be presented during class, via powerpoint and whiteboard. Classes will include time for student discussion and worked example problems.

### ***Statement on Disabilities and Accommodation***

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

### ***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 work of another student, possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an "excuse" for academic misconduct. If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct, the sanctions for the

## **EEOB 5350: *Evolutionary Ecology***

misconduct could include a failing grade in this course and/or suspension or dismissal from the University. For additional information, see the Code of Student Conduct ([http://studentaffairs.osu.edu/info\\_for\\_students/csc.asp](http://studentaffairs.osu.edu/info_for_students/csc.asp)).

### ***Grievances and Solving Problems***

According to University Policies (available from the Division of Student Affairs), if you have a problem with this class, you should seek to resolve a grievance concerning a grade or academic practice by speaking first with the professor. Then, if necessary, with the department chairperson, college dean, and provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23, which is available from the Office of Student Life, 208 Ohio Union.

### ***Statement on Diversity***

The Department of Evolution, Ecology, and Organismal Biology Ecology 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. Discrimination against any individual based on 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. If you experience or witness discrimination, you are encouraged to report it to the instructors so that they can address unacceptable behavior or remediate unacceptable situations.

### ***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](mailto:titleix@osu.edu)

EEOB 5350: Evolutionary Ecology

**Schedule of Topics & Readings**

	<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Assignments</b>
1	Jan 8	Introduction; Adaptation and selection: Price's equation	Gardner 2008 Curr Biol	
2	Jan 10	Adaptation and selection: indirect genetic effects and social evolution	Wolf et al. 1998 TREE Moore et al. 1997 Evolution	
3	Jan 15	Individual variation: plasticity and personality	Wolf and Weissing 2012 TREE Dingemanse et al., 2010 Phil Trans R. Soc Lond., B	
4	Jan 17	Case study: personality and fitness in songbirds	Dingemanse et al. 2004 Proc R Soc Lond., B Van Oers et al. 2008 Anim Behav	
5	Jan 22	Life history tradeoffs	Roff and Fairbairn 2007 J Evol Biol Roff 2006 J Evol Biol	<b>Assignment 1 (variation, adaptation and selection) due</b>
6	Jan 24	Case study: life history responses to fishing	Rijnsdorp 1993 Oecologia Kuparinen and Marila 2007 TREE	
7	Jan 29	Life history theory: quantity and quality	Olofsson et al. 2009 Proc R Soc Lond., B Muller-Landau et al. 2010 PNAS	<b>Proposal topic due</b>
8	Jan 31	Case study: tradeoffs in human reproduction	Gillespie et al. 2008 Proc R Soc Lond., B Lawson and Bergerhoff Mulder 2016 Phil Trans R Soc Lond., B	
9	Feb 5	Evolution of sex	Hartfield & Keightley 2012 Integr Zool Morran et al. 2011 Science	<b>Assignment 2 (Life history theory) due</b>
10	Feb 7	Case study: Snails	Jokela et al. 2009 Am Nat King et al. 2009 Current Biology	
11	Feb 12	Sexual selection and speciation	Maan and Seehausen 2011 Ecology Letters Verzijden et al. 2012 TREE	
12	Feb 14	Case study: Sexual selection and speciation in cichlid fishes	Maan et al. 2004 Proc R Soc Lond., B Maan et al. 2010 Biol J. Linnean Society	
13	Feb 19	Social evolution	Garner & West 2006 Curr Biol Diggle et al. 2007 Nature	<b>Assignment 3 (Sexual reproduction) due</b>
14	Feb 21	Social evolution	West et al. 2007 Current Biology Taborsky et al. 2016 Phil Trans	
15	Feb 26	<b>Midterm</b>	---	
16	Feb 28	Case study: mycorrhizal fungi	TBD	

EEOB 5350: Evolutionary Ecology

17	Mar 5	Biological markets	<a href="#">Hammerstein &amp; Noe 2016</a> ; Noe & Kiers 2018 TREE	
18	Mar 7	Case study: cleaner-client fish	Bshary et al. 2008 Nature Bshary & Grutter 2006 Nature	
19	Mar 12	<i>No class, Spring Break</i>	--	
20	Mar 14	<i>No class, Spring Break</i>	--	
21	Mar 19	Microbial symbioses	Foster et al. 2017 Nature	
22	Mar 21	Case study: leaf-cutter ants	Adams et al. 2013 PNAS	<b>Assignment 4 (Social evolution) due</b>
23	Mar 26	Mutualisms: pollination, seed dispersal	Bronstein et al. 2006 New Phytologist	
24	Mar 28	Pathogens and hosts	Johnson et al. 2015 Science	<b>Submit paper draft</b>
25	Apr 2	Case study: Wolbachia	Werren et al. 2008 Nature Rev Micr	
26	Apr 4	Predators and prey	Yoshia et al. 2003 Nature, Johnson & Agrawal 2003 TREE	<b>Submit peer review</b>
27	Apr 9	Case study: figs	<a href="#">Herre et al. 2008</a>	
28	Apr 11	Anthropogenic change	<a href="#">Kiers et al. 2010</a> , Merilä & Hendry 2014 Evol Appl	<b>Assignment 5 (interspecies interaction) due</b>
29	Apr 16	Evolutionary conservation biology	Carroll et al. 2014 Science	
30	Apr 18	Eco-evolutionary dynamics	Schoener et al. Science 2011	<b>Final paper due</b>

*Final Exam Week:* **Final Exam**

