

<b>Fiscal Unit/Academic Org</b>	Evolution, Ecology & Org Bio - D0390
<b>Administering College/Academic Group</b>	Arts And Sciences
<b>Co-administering College/Academic Group</b>	Biological Sciences Arts And Sciences
<b>Semester Conversion Designation</b>	Re-envisioned with significant changes to program goals and/or curricular requirements (e.g., degree/major name changes, changes in program goals, changes in core requirements, structural changes to tracks/options/courses)
<b>Current Program/Plan Name</b>	Evolution & Ecology
<b>Proposed Program/Plan Name</b>	Evolution & Ecology Bachelor of Science Degree
<b>Program/Plan Code Abbreviation</b>	EVOLECO-BS
<b>Current Degree Title</b>	Bachelor of Science

### Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		45	30.0	30	0.0
Required credit hours offered by the unit	Minimum	35	23.3	23	0.3
	Maximum	35	23.3	23	0.3
Required credit hours offered outside of the unit	Minimum	9	6.0	7	1.0
	Maximum	11	7.3	7	0.3
Required prerequisite credit hours not included above	Minimum	51	34.0	40	6.0
	Maximum	51	34.0	40	6.0

**Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table**

BIO 1113 and 1114 went from 10 quarter credit hours to 8 semester hours (incr 1.4 hr); reduced 10 quarter credit hours for Math to 5 semester hours (1.6 hr difference); Physics: 10 quarter credits transitions to 10 semester credits (incr 3.4 hr); Organic chem changes from 6 quarter credits to 5 semester credits ( incr 1 hr); no statistics required in quarters, 3 hr required in semesters (incr 3 hr).

### Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

**Program Learning Goals**

- Students are able to describe the processes that underlie evolution and their manifestation in the natural world.
- Students are able to explain ecological concepts, methods of study, and the interactions among organisms and between organisms and their environment
- Students are able to understand organismal diversity and functioning at all levels, from the molecular and cellular to the whole organism, as well as the interplay between organismal functioning and ecological and evolutionary processes.
- Students participate in the process of discovery by conducting experimental and observational studies, synthesizing results with the primary literature, and communicating their questions, hypotheses, observations, and experiences to others.
- Students demonstrate proficiency in mathematics, statistics, computer modeling, and the use of computers, as these topics relate to biology.
- Students know the theoretical framework of evolution, ecology and organismal biology and understand science as a process, including the history of science as it relates to these three disciplines within biology.
- Students are aware of current issues in biology, especially those that have significant ethical and societal implications, and will be able to communicate scientific concepts and processes.

**Assessment**

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

**Is this a degree program (undergraduate, graduate, or professional) or major proposal?** Yes

**Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs?** Yes

**Summarize how the program's current quarter-based assessment practices will be modified, if necessary, to fit the semester calendar.**

No modifications are needed at this time.

**Program Specializations/Sub-Plans**

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

**Pre-Major**

**Does this Program have a Pre-Major?** No

**Attachments**

- EE proposal docs.pdf  
*(Program Proposal. Owner: Wolfe, Andrea Dayle)*
- Ecology and Evolution minor cover letter.doc: NMS Division of Arts and Sciences cover letter  
*(Letter from the College to OAA. Owner: Andereck, Claude David)*

**Comments**

- Feedback will be provided by Chuck Daniels. *(by Vankeerbergen, Bernadette Chantal on 12/16/2010 09:52 AM)*

## Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Wolfe, Andrea Dayle	11/01/2010 11:01 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	11/01/2010 11:03 AM	Unit Approval
Revision Requested	Andereck, Claude David	11/10/2010 01:24 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/02/2010 10:51 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/02/2010 11:07 AM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 10:46 AM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 11:29 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 11:29 AM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 02:02 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 03:13 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 03:26 PM	Unit Approval
Approved	Andereck, Claude David	12/07/2010 03:51 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	12/16/2010 09:52 AM	ASCCAO Approval
Submitted	Wolfe, Andrea Dayle	01/14/2011 03:30 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	01/14/2011 03:31 PM	Unit Approval
Revision Requested	Andereck, Claude David	01/17/2011 02:00 PM	College Approval
Submitted	Wolfe, Andrea Dayle	02/15/2011 09:45 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	02/15/2011 09:45 AM	Unit Approval
Revision Requested	Andereck, Claude David	02/23/2011 03:00 PM	College Approval
Submitted	Wolfe, Andrea Dayle	03/16/2011 02:52 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	03/16/2011 02:52 PM	Unit Approval
Revision Requested	Andereck, Claude David	03/16/2011 05:20 PM	College Approval
Submitted	Wolfe, Andrea Dayle	03/17/2011 11:06 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	03/17/2011 11:07 AM	Unit Approval
Approved	Andereck, Claude David	03/17/2011 11:15 AM	College Approval
Pending Approval	Hanlin, Deborah Kay Vankeerbergen, Bernadette Chantal Meyers, Catherine Anne Jenkins, Mary Ellen Bigler Nolen, Dawn	03/17/2011 11:15 AM	ASCCAO Approval

186 University Hall  
230 North Oval Mall  
Columbus, OH 43210

Phone (614) 292-8908  
Fax (614) 247-7498

February 14, 2011

Larry Krissek  
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the undergraduate minor in Evolution and Ecology under semesters. The minor has been modified from its present quarter version through a significant re-structuring of courses, as well as by decreasing the prerequisite requirements.

Beyond my own review of the documents, the proposal has been discussed by colleagues from other NMS units at a meeting on December 8, 2010. Feedback from the discussions and from the Sciences Subcommittee of CCI and CCI itself, has been incorporated in the proposal.

If you have any questions, I would be happy to address them.

Sincerely,



David Andereck  
Professor of Physics  
Associate Dean of Natural and Mathematical Sciences, College of Arts and Sciences



To: Office of Academic Affairs

From: Dr. Peter S. Curtis, Chair, Department of EEOB

A handwritten signature in black ink, appearing to be "P. S. Curtis", written over the "From:" line.

Date: 22 November 2010

Re: Semester Program Proposals for Evolution and Ecology and Zoology majors

The Department of EEOB has the following programs that will be converted from quarters to semesters:

- 1) Undergraduate Zoology Major (BS & BA)
- 2) Undergraduate Evolution & Ecology Major (BS)
- 3) Undergraduate Zoology Minor
- 4) Undergraduate Evolution & Ecology Minor
- 5) Evolution, Ecology and Organismal Biology MS
- 6) Evolution, Ecology and Organismal Biology PhD

We will be proposing semester programs for each of these six areas, beginning with the undergraduate majors and minors and then for each of the graduate programs.

The EEOB curriculum committee has been working on the semester conversion for the past academic year, involving both discussion by the faculty as a whole and more focused attention by three working groups of faculty and staff covering each of the major areas of research and teaching covered in our department: Evolution, Ecology, and Organismal Biology. We have revised the program goals from our previous major program change, which occurred when faculty from the Departments of Zoology and Plant Biology merged to form the Department of EEOB in 1998. One of the major differences between our previous program goals and the revised ones is addition of the goal that all of our students will be "knowledgeable in mathematics, statistics, computer modeling, and the use of computers, as these topics relate to biology." To meet this program goal we have added a requirement for statistics in all undergraduate majors and an additional course in quantitative analysis for the Evolution and Ecology major.

Our semester conversion efforts were launched with a faculty retreat in November 2009 specifically focused on curricular discussions. The curriculum committee took the lead in framing curricular revisions, first by mapping our existing courses onto our program goals, and second by noting overlaps of information across our curriculum that offered opportunities for combining courses with similar curricular content into courses that can fit

easily into a semester format. In January 2010, the three working groups mentioned above were formed to assess and revise the content of our curriculum in three major areas: evolution, ecology, and organismal biology. The proposed curricular changes were discussed during faculty meetings in Spring Quarter 2010 and approved by the entire faculty at the beginning of Autumn Quarter 2010.

Semester courses in which content was combined from our existing curriculum include:

EEOB 3410 Ecology – combines the lecture (503.01) and lab content (503.02) of our General Ecology course.

EEOB 3320 Organismal Diversity – combines the content of the lecture (405.01) and lab (405.02) content of our Organismal Diversity course.

EEOB 3420 Behavioral Ecology – combines the content of our Introductory Ethology course with three related courses that were taught less frequently into one comprehensive course.

EEOB 4430 Ecological Methods I– A new course that combines the methods instruction content of each of a number of our ecological courses with field components into a comprehensive course that will be offered each May term.

EEOB 5420 Aquatic Ecosystems – Ecology of Inland Waters – combines the content of two freshwater ecology courses (Plankton and Limnology) into a comprehensive course on the ecology of freshwater ecosystems.

EEOB 5430 Aquatic Ecosystems - Fish Ecology – combines the content of two related courses on fish biology into one comprehensive course.

EEOB 5460 Physiological Ecology – combines the content of our plant and animal physiological ecology courses into one comprehensive course.

EEOB 5470 Community Ecosystems and Ecology – combines the ecological content from our Biogeography course with our Community Ecology and Ecosystems course.

The decision to restructure the curriculum in this fashion came after a thorough examination of course content and curricular mapping of our quarters classes. The Department of EEOB is committed to excellence in teaching and has initiated professional development workshops (course development and pedagogy) through UCAT for all teaching faculty and staff. These workshops will take place in Winter and Spring quarters of 2011.

## **Rationale for Changes to the Undergraduate Evolution and Ecology Majors Programs**

The Department of Evolution, Ecology, and Organismal Biology (EEOB) currently offers a BS and BA in Evolution and Ecology (EE). Under semesters, the BA option for the EE major will be eliminated because we've increased the quantitative elements of the EE degree to the point that it would be unfeasible to reduce the course load for a BA degree. Other changes to this major are summarized below.

### **Evolution and Ecology Major - BS**

The Department of Evolution, Ecology, and Organismal Biology (EEOB) currently offers a BS undergraduate major program in Evolution and Ecology. The EE major is appropriate for students interested in the evolution of species, or in the interactions of species at the population, community, and ecosystem levels. The EE major serves as an excellent foundation for students intending to pursue graduate study in organismal biology, evolution or ecology. It also provides the educational background for pursuing many career tracks in natural science.

Under the semester system, the basic structure of the EE major will be maintained while providing students greater flexibility. Required supportive courses include: BIOL 1113 and 1114, MATH 1151 or 1156, a two-semester sequence of general chemistry (CHEM 1210, 1220), a two-semester sequence of physics (PHYSICS 1250, 1251), and Statistics for Life Sciences (STAT 2480). The EE majors will be only be required to take one semester of organic chemistry (CHEM 2310 or 2510), rather than the two-semester sequence of organic chemistry required by EEOB Zoology majors, thus providing greater flexibility by increasing the options for other courses within the major. The five core courses/areas of the EE major are evolution, ecology, integrated biology, biodiversity, and advanced concepts in evolution/ecology. For each of the first three core areas only one course (or honors version thereof) will satisfy the requirement (Evolution: EEOB 3310; Ecology: EEOB 3410; and Integrated Biology: Biology 2401). However, for the remaining two areas, biodiversity and advanced evolution/ecology, students may choose from a variety of courses. Students must take two courses in biodiversity from among seven possibilities, and two courses in advanced evolution/ecology from among 11 possibilities. These requirements are quite similar to the corresponding requirements in the quarter system. The requirement for a statistics course was included in the major under the quarter system, and has been retained under the semester system. An additional course focused on advanced quantitative skills will also be required for the major. The minimum number of units (semester hours) in the major is 30, and, depending on which courses a student chooses to satisfy the core requirements, she/he will need between zero and 10 units of electives to achieve this minimum. Courses acceptable as electives include any course in EEOB at the 2000 level or higher, as well as courses in other departments, as long as these courses fulfill the goals of the EE major. Students will need to consult the EEOB EE advisor if they have are uncertain whether a particular course can count as an elective in the major.

As noted in our cover letter, several courses have been restructured to combine content of related courses into more comprehensive semester courses. These include: EEOB 3410 – Ecology; EEOB 3320 – Organismal Diversity; EEOB 3420 – Behavioral Ecology; EEOB 4430 –

Ecological Methods I; EEOB 5420 – Aquatic Ecosystems (Ecology of Inland Waters); EEOB 5430 – Aquatic Ecosystems (Fish Ecology); EEOB 5460 – Physiological Ecology; and EEOB 5470 – Community Ecosystems and Ecology. The decision to restructure the curriculum in this fashion came after a thorough examination of course content and curricular mapping of our quarters classes.

### **Transition Policy: Evolution and Ecology major – BS**

Students who have declared the BS Evolution and Ecology (EE) major within the three years prior to the switch to semesters can finish under the old requirements, or they can switch to the new ones. Since every core course or category under the old requirements has its equivalent (often with more options) under the new requirements, we do not foresee any great difficulties arising during the transition. Any course that fulfilled a requirement under the old rules will also do so under the new ones. The only potential difficulty is the requirement for a statistics course in the EE major. If a student who started under the old system wants to fulfill the new degree requirements but finds it difficult to fit in one of the required statistics courses, we will waive this requirement.

Potential problems in transition can arise in fulfilling the BS requirements if a student is partway through a two- or three-quarter sequence (e.g., in chemistry or physics). For such cases, we are relying on the relevant departments to create needed transitional courses.

Fortunately, because EEOB does not offer any two-course sequences, we will not need to develop any bridge courses. The only problem that might arise concerns courses that currently have separate lecture and laboratory components, in which the lab can be taken subsequent to the lecture. Only two such courses currently exist, Ecology (EEOB 503.01 is the lecture and 503.02 the lab) and Organismal Diversity (EEOB 405.01 is the lecture, 405.02 is the lab). Under semesters, the laboratory in these courses (EEOB 4410 and 3320, respectively) will be a mandatory part of the course. This raises the possibility that a student will have had the lecture but not the lab when the transition to semesters occurs. We will strive through advising to make sure a student is not caught in this predicament, but, if it happens, we will insert the student into the appropriate lab using the individual studies option (EEOB 3193), or else waive the requirement. Adequate resources and personnel for advising students during the transition period currently exist in the Department of EEOB and so we foresee no difficulties in easing our students into the semester conversion.



## Course Listing and Curriculum Map for the Evolution and Ecology Major

### Required supportive courses (do not count towards hours in the major)

Requirements	Semester Course Number	Course Title	Semester Units	Quarter Equivalent Course Number	Quarter Credits	Notes	Relevant Program Goals
<b>Biology</b>	BIO 1113	Intro Bio	4	BIO 113	5	BIO 115H also accepted	1,2,3
	BIO 1114	Intro Bio	4	BIO 114	5	BIO 116H also accepted	1,2,3
<b>Math</b>	MATH 1151	Calculus 1	5	MATH 151,152	10	MATH 1156 also accepted	5
<b>General Chem</b>	CHEM 1210,1220	General Chem	10	CHEM 121,122,123	15	2 semesters of general chemistry required for program	4
<b>Organic Chem</b>	CHEM 2310 or CHEM 2510	Organic Chem	4	CHEM 231,232	6	1 semester organic chem required for majors; pre-professional track advised to take 2 semesters	4
<b>Physics</b>	PHYSICS 1250 & 1251	General Physics	10	PHYSICS 111, 112 or 131, 132	10		4
<b>Statistics</b>	STAT 2480	Statistics for Life Sciences	3			Required as core course under majors; STAT 2450 also accepted	5

### Required core courses

	EEOB 3310 or 3310H	Evolution	4	EEOB 400H	5	Enhanced content	1*, 3*, 5*, 6*, 7*
	EEOB 3410 or 3410H	Ecology	4	EEOB 503.01 and EEOB 503.02, or EEOB 503.03	4 2 6	Combines the content of the independent lecture and lab courses (6 hrs), or replaces the 6 hr EEOB 503.03 course	2*,3*,5*
	MOLGEN 4500	General Genetics	n/a	MOLGEN 500	5	Not required core in semesters	
	BIO 2401	Integrated Biology	4			Will replace MOLGEN 500 requirement for majors	1*, 2*, 3*
	MATH or STATS	Advanced quantitative analysis course (in development)	3			Majors will receive additional quantitative skills training in semester system	5*

### Elective courses in Biodiversity (choose at least two)

	EEOB 2210	Ohio Plants	2		EEOB 210	5	7-week course, similar content	1,2,3,4,6,7
	EEOB 2220	Ohio Birds	2		EEOB 322	5	7-week course, similar content	1,2,3,4,6,7
	EEOB 3320	Org Diversity	3		EEOB 405.01 EEOB 405.02	4 2	Merges contents of EEOB 405.01 and 405.02; combination of lab and lecture	1*,2*,3*,4*,7*
	EEOB 4210	E&E Vertebrates	2		EEOB 470	5	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*
	EEOB 4220	E&E Mammals	2		EEOB 625	5	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*
	EEOB 4230	E&E Invertebrates	2				New course	1*,2*,3*,4*
	EEOB 4240	E&E Plants People	2		EEOB 502	4	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*,7*

### Elective courses in Evolution and Ecology (choose at least two)

	EEOB 3420	Behavioral Ecol	4		EEOB 440 EEOB 620 EEOB 730 EEOB 740	4 4 3 5	Combines the content of four courses (Ethology, Animal Communication, Bioacoustics, and Behavioral Ecology) into one comprehensive course on Behavioral Ecology; eliminates curricular content duplication from existing quarters courses	2*,3*
	EEOB 4410	Conserv Biol	3		EEOB 661	5	Similar content	2*,5*,7*
	EEOB 4420	Trop Field Studies	2		EEOB 557H	3	Similar content	2*,5*
	EEOB 4430	Ecol Methods I	1				New course	2*,3*,5
	EEOB 5310	Adv Evolution	3		EEOB 673	5	New course title, similar content as previous course, plus addition of animal case studies	1**,2*,3**,4*,5*,6**,7**
	EEOB 5320	Creation & Evol	3		EEOB 710	5	Same content	1**,6**,7**
	EEOB 5410	Ocean Ecology	1.5		EEOB 505	5	New course title, same content as previous course	2**,3*,5*
	EEOB 5420	Ecol Inland Waters	1.5		EEOB 647 EEOB 655	5 5	Combines the content of two courses (Plankton and Limnology); eliminates curricular content duplication from existing quarters courses	2**,3*,5*
	EEOB 5430	Fish Ecology	1.5		EEOB 626 EEOB 621	5 5	Combines the content of two courses (Biology of Fishes and Ichthyology); eliminates curricular content duplication from existing quarters courses	2**,3*,5*
	EEOB 5450	Popul Ecology	3		EEOB 671	5	Same content	2**,5**
	EEOB 5460	Physio Ecology	3		EEOB 654.01	4	Combines the contents of two	2**,5**

					EEOB 674	5	course (Ecological Physiology of Animals and Physiological Ecology of Plants) ); eliminates curricular content duplication from existing quarters courses	
	EEOB 5470	Comm Ecosys Ecol	3		EEOB 700 EEOB 720	5 5	Combines content from two courses (Biogeography and Community Ecology and Ecosystems) ); eliminates curricular content duplication from existing quarters courses	2**,3**,4**,5**

### All elective courses in EEOB that could count toward major

Requirements	Semester Course Number	Course Title	Semester Units		Quarter Equivalent Course Number	Quarter Credits	Notes	Relevant Program Goals
	EEOB 2210	Ohio Plants	2		EEOB 210	5	7-week course, similar content	1,2,3,4,6,7
	EEOB 2220	Ohio Birds	2		EEOB 322	5	7-week course, similar content	1,2,3,4,6,7
	EEOB 2250	Dyn Dinosaurs	1.5		EEOB 350	3	7-week course, similar content	1,3
	EEOB 2510	Human Anatomy	3		EEOB 235	5	Similar content	3,4
	EEOB 2520	Human Physiol	3		EEOB 232	5	Similar content	1,3,6,7
	EEOB 3189	UG Field Work	1-3					
	EEOB 3191	UG Internship	1-3					
	EEOB 3193	UG Indiv Studies	1-3		EEOB 293	1-5		
	EEOB 3194	UG Group Studies	1-3		EEOB 294	1-5		
	EEOB 3320	Org Diversity	3		EEOB 405.01 EEOB 405.02	4 2	Merges contents of EEOB 405.01 and 405.02; combination of lab and lecture	1*,2*,3*,4*,7*
	EEOB 3420	Behavioral Ecol	4		EEOB 440 EEOB 620 EEOB 730 EEOB 740	4 4 3 5	Combines the content of four courses (Ethology, Animal Communication, Bioacoustics, and Behavioral Ecology) into one comprehensive course on Behavioral Ecology; eliminates curricular content duplication from existing quarters courses	2*,3*
	EEOB 3510	Cell Dev Biol	3		EEOB 415	4	Enhanced content	1,3*,7
	EEOB 3520	Micro Anatomy	1.5		EEOB 630	5	New course title (changed from Vertebrate Histology), similar content as previous course	3**,4*,5*,6*,7**
	EEOB 3797	UG Foreign study	1-12		EEOB 697			
	EEOB 3798	UG Study Tour	1-12		EEOB 698			
	EEOB 4210	E&E Vertebrates	2		EEOB 470	5	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*
	EEOB 4220	E&E Mammals	2		EEOB 625	5	Similar or enhanced content (if	1*,2*,3*,4*

						taught as 14 week course)		
	EEOB 4230	E&E Invertebrates	2			New course	1*,2*,3*,4*	
	EEOB 4240	E&E Plants People	2		EEOB 502	4	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*,7*
	EEOB 4410	Conserv Biol	3		EEOB 661	5	Similar content	2*,5*,7*
	EEOB 4420	Trop Field Studies	2		EEOB 557H	3	Similar content	2*,5*
	EEOB 4430	Ecol Methods I	2				New course	2*,3*,5
	EEOB 4510	Comp Vert Anat	3		EEOB 512	2	Similar content	1*,3*,6*
	EEOB 4520	Comp Physiology	3		EEOB 410	4	New course title, enhanced content from previous course	2*,3*,5*
	EEOB 4520-H	Comp Physio - H	3		EEOB 410H	4	New course title, enhanced content from previous course	2*,3*,5*
	EEOB 4550	Neurobio Behavior	3		EEOB 632	3	New course title, enhanced content from previous course	3**,5*,6*
	EEOB 4560	Endocrinology	2		EEOB 550	3	Similar content	1*,3**,4*
	EEOB 4910	Plants Tch SL	2		EEOB 511	3	Summer course at Stone Lab	1*,2*,3*
	EEOB 4920	Birds Tch SL	2		EEOB 522	3	Summer course at Stone Lab	1*,2*,3*
	EEOB 4930	Stream Eco Tch SL	2		EEOB 785	3	Summer course at Stone Lab	2*,3*
	EEOB 4950	Field Ecol SL	2		EEOB 513	3	Summer course at Stone Lab	2*,3*
	EEOB 4998	UG Research	1-3		EEOB 699			
	EEOB 4998H	UG Honors Research	1-3		EEOB 699H			
	EEOB 4999	UG Thesis Res	1-5					
	EEOB 4999H	UG Honors Thesis Res	1-5					
	EEOB 5189	Field Work	1-4		EEOB 510	5	One course title to cover all of our field-oriented courses; topical emphasis to be announced with each offering	
				EEOB 513	3			
				EEOB 622	3			
				EEOB 651	5			
				EEOB 657	5			
	EEOB 5310	Adv Evolution	3		EEOB 673	5	New course title, similar content as previous course, plus addition of animal case studies	1**,2*,3**,4*,5*,6**,7**
	EEOB 5320	Creation & Evol	3		EEOB 710	5	Same content	1**,6**,7**
	EEOB 5410	Ocean Ecology	1.5		EEOB 505	5	New course title, similar content as previous course	2**,3*,5*
	EEOB 5420	Ecol Inland Waters	1.5		EEOB 647	5	Combines the content of two courses (Plankton and Limnology), and eliminates curricular content duplication	2**,3*,5*
				EEOB 655	5			
	EEOB 5430	Fish Ecology	1.5		EEOB 626	5	Combines the content of two courses (Biology of Fishes and Ichthyology), and eliminates curricular content duplication	2**,3*,5*
				EEOB 621	5			
	EEOB 5450	Popul Ecology	3		EEOB 671	5	Same content	2**,5**

	EEOB 5460	Physio Ecology	3		EEOB 654.01 EEOB 674	4 5	Combines the contents of two course (Ecological Physiology of Animals and Physiological Ecology of Plants), and eliminates curricular content duplication	2**,5**
	EEOB 5470	Comm Ecosys Ecol	3		EEOB 700 EEOB 720	5 5	Combines content from two courses (Biogeography and Community Ecology and Ecosystems), and eliminates curricular content duplication	2**,3**,4**,5**
	EEOB 5910	Herpetology SL	2		EEOB 622	3	Summer course at Stone Lab	1*,2*,3*
	EEOB 5920	Aquatic Plants SL	3		EEOB 611	5	Summer course at Stone Lab	1*,2*,3*
	EEOB 5930	Fish Biology SL	3		EEOB 621	5	Summer course at Stone Lab	1*,2*,3*
	EEOB 5940	Field Zoology SL	3		EEOB 651	5	Summer course at Stone Lab	1*,2*,3*
	EEOB 5950	Algae ID SL	0.5		EEOB 692	1-6	Summer course at Stone Lab	3*
	EEOB 5960	Plankton ID SL	0.5		EEOB 692	1-6	Summer course at Stone Lab	3*
	EEOB 5970	Larval Fish ID SL	0.5		EEOB 692	1-6	Summer course at Stone Lab	3*

### Program learning goals:

1. Students are able to describe the processes that underlie evolution and their manifestation in the natural world.
2. Students are able to explain ecological concepts, methods of study, and the interactions among organisms and between organisms and their environment.
3. Students are able to understand organismal diversity and functioning at all levels, from the molecular and cellular to the whole organism, and will understand the interplay between organismal functioning and ecological and evolutionary processes.
4. Students participate in the process of discovery by conducting experimental and observational studies, synthesizing results with the primary literature, and communicating their questions, hypotheses, observations, and experiences to others.
5. Students demonstrate proficiency in mathematics, statistics, computer modeling, and the use of computers, as these topics relate to biology
6. Students know the theoretical framework of evolution, ecology and organismal biology and understand science as a process, including the history of science as it relates to these three disciplines within biology.
7. Students are aware of current issues in biology, especially those that have significant ethical and societal implications, and will be able to communicate scientific concepts and processes.

### Notes:

Program goal numbers that have no asterisk indicate a beginner's level; \* = intermediate level; \*\* = advanced level. Honors versions of courses may be substituted in all cases; no more than three units of S/U credit can count toward the major.

## Evolution and Ecology Major Program Bachelor of Science

Name \_\_\_\_\_

Semester of Graduation \_\_\_\_\_

### Required Supporting Courses

#### Biology (2 courses)

- Biology 1113 or 1113H (4 hr)
- Biology 1114 or 1114H (4 hr)
- \_\_\_\_\_ Substitution
- Waived

#### Mathematics (1 course)

- Math 1151 (5 hr)
- Math 1156 (5 hr)
- \_\_\_\_\_ Substitution
- Waived

#### Physics (2 courses)

- Physics 1250 or 1250H (5 hr)
- Physics 1251 or 1251H (5 hr)
- \_\_\_\_\_ Substitution
- Waived

#### Chemistry (2 courses)

- Chemistry 1210 (5 hr)
- Chemistry 1220 (5 hr)
- \_\_\_\_\_ Substitution
- Waived

#### Organic Chemistry (1 course)

- Chemistry 2310 or Chemistry 2510 (4 hr)
- \_\_\_\_\_ Substitution
- Waived

#### Statistics (1 course)

- Statistics 2480 (3 hr)
- Statistics 2450 (3 hr)
- \_\_\_\_\_ Substitution
- Waived

### Core Courses

- EEOB 3310 or 3310H (4 hr)
- EEOB 3410 or 3410H (4 hr)
- Biology 2401 (4 hr)
- Advanced course in math or stats (3 hr)
- \_\_\_\_\_ Substitution

#### Biodiversity (any 2)

- EEOB 2210 (2 hr)
- EEOB 2220 (2 hr)
- EEOB 3220 (3 hr)
- EEOB 4210 (2 hr)
- EEOB 4220 (2 hr)
- EEOB 4230 (2 hr)
- EEOB 4240 (2 hr)

#### Evolution and Ecology (any 2)

- EEOB 3420 (4 hr)
- EEOB 4410 (3 hr)
- EEOB 4420 (2 hr)
- EEOB 4430 (1 hr)
- EEOB 5310 (3 hr)
- EEOB 5320 (3 hr)
- EEOB 5410 (1.5 hr)
- EEOB 5420 (1.5 hr)
- EEOB 5430 (1.5 hr)
- EEOB 5450 (1.5 hr)
- EEOB 5460 (3 hr)
- EEOB 5470 (3 hr)

### Electives

\_\_\_\_\_

Core courses and electives must total at least 30 semester units.

Honors courses may be substituted for regular courses.

Advisor (Printed) \_\_\_\_\_

Advisor (Signature) \_\_\_\_\_

Date \_\_\_\_\_

## Evolution and Ecology Major Program (BS)

The Evolution and Ecology major includes coursework that focuses on evolutionary and ecological phenomena in plants, fungi, and microbes as well as animals.

### Part A. Required Prerequisites or Supplements to the Major (do not count toward 45 hour major)

Courses	Hours
<input type="checkbox"/> Biology 113-114 or H115-H116	10
<input type="checkbox"/> Chemistry 121, 122, 123; 231 and 232	21
<input type="checkbox"/> Mathematics 151-152	10
<input type="checkbox"/> Physics 111-112 or 131-132	10

### Part B. Core Requirements

<input type="checkbox"/> EEOB 400 or H400, 405.01, 503.01 or H503.01 and 503.02, 695	≥ 15
<input type="checkbox"/> Molecular Genetics 500 or 605 and 606	5-6
<input type="checkbox"/> Statistics 245 or Psychology 320 or Statistics 218 or Molecular Genetics 650	4-5

### Part C. Other Major Courses

1. Biodiversity Requirement. Two courses in organismal diversity are required. These courses must be from two of the following three categories: (a) vertebrates, (b) non-vertebrates, and (c) plants.
  - a. EEOB 322, 350, 621, 625, 626; Anthropology 300, 301, 304
  - b. EEOB 405.02, 647; Entomology 500, 612; Microbiology 521; Natural Resources 627
  - c. EEOB 210, 502, 611, 672; PCMB 300
2. Evolution and Ecology Requirement. One course in evolution or ecology must be taken from among the following possibilities: EEOB 370, 617, 651, 652, 653, 655, 656, 661, 671, 674, 700, 710, 720, 740; Entomology 621, 641; Molecular Genetics 640, 711; Natural Resources 322, 618, 710, 725; Anthropology 409, 411, 500, 610; Soil Science 682.
3. Additional courses in EEOB at the 200 level or higher (excluding EEOB 232 and 235) must be taken to achieve at least 40 credit hours (if this total is not already achieved). EEOB 699 (independent study) is especially encouraged.
4. An additional 5 credit hours at the 200 level or higher, for a total of 45 hours, can be taken either in EEOB or in another department (e.g., Geological Sciences, Natural Resources). If these last 5 hours come from outside EEOB, your advisor must approve the course

**With approval of your advisor, courses may be substituted for those listed as satisfying the diversity and evolution/ecology requirements.**

TOTAL: 45 OR MORE HOURS AT THE 200 LEVEL OR ABOVE (PARTS B and C)  
A minimum grade of C- in each course and a 2.0 overall GPA in the major is required.

For more information about the Evolution and Ecology major, contact:

Professor Dave Stetson, [stetson.1@osu.edu](mailto:stetson.1@osu.edu), 614-292-5307  
see also: <http://www.biosci.ohio-state.edu/~eeob/>

# EEOB Evolution and Ecology Major (BS)

## Sample curricula for students at different stages of the transition

Graduating spring 2012 or earlier	Graduating spring 2013	Graduating spring 2014	Graduating spring 2015	Graduating spring 2016 or later
Biology Survey 1	Biology Survey 1	Biology Survey 1	Biology Survey 1	Biology Survey 1
Math 148 (algebra & trigonometry) 5	Math 148 (algebra & trigonometry) 5	Math 148 (algebra & trigonometry) 5	Math 148 (algebra & trigonometry) 5	Math 1148 (algebra & trigonometry) 4
GEC 5	GEC 5	GEC 5	GEC 5	Chem 1210 (chemistry 1) 5
<u>GEC 5 16</u>	<u>GEC 5 16</u>	<u>GEC 5 16</u>	<u>GEC 5 16</u>	GE 3
Math 150 (elementary functions) 5	Math 150 (elementary functions) 5	Math 150 (elementary functions) 5	Math 150 (elementary functions) 5	<u>Biology 1113 (intro bio 1) 4 17</u>
Chem 121 (chemistry 1) 5	Chem 121 (chemistry 1) 5	Chem 121 (chemistry 1) 5	Chem 121 (chemistry 1) 5	Math 1150 (pre-calculus) 5
<u>Biology 113 (intro bio 1) 5 15</u>	<u>Biology 113 (intro bio 1) 5 15</u>	<u>Biology 113 (intro bio 1) 5 15</u>	<u>Biology 113 (intro bio 1) 5 15</u>	Chem 1220 (chemistry 2) 5
GEC 5	GEC 5	GEC 5	GEC 5	<u>Biology 1114 (intro bio 2) 4 14</u>
Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	
<u>Biology 114 (intro bio 2) 5 15</u>	<u>Biology 114 (intro bio 2) 5 15</u>	<u>Biology 114 (intro bio 2) 5 15</u>	<u>Biology 114 (intro bio 2) 5 15</u>	
			<b>Total quarter hours 46</b>	
			<b>Equivalent semester units 30</b>	
Chem 123 (chemistry 3) 5	Chem 123 (chemistry 3) 5	Chem 123 (chemistry 3) 5	Math 1151 (calculus 1) 5	Math 1151 (calculus 1) 5
Math 151 (calculus 1) 5	Math 151 (calculus 1) 5	Math 151 (calculus 1) 5	Chem 123T (transition course) 3	GE 3
<u>EEOB 400 (intro evolution) 5 15</u>	<u>EEOB 400 (intro evolution) 5 15</u>	Unrestricted elective 2	Biology 2401 (integrated biology) 4	Biology 2401 (integrated biology) 4
Math 152 (calculus 2) 5	Math 152 (calculus 2) 5	<u>EEOB 400 (intro evolution) 5 17</u>	<u>Physics 1250 (physics 1) 5 17</u>	<u>Physics 1250 (physics 1) 5 17</u>
Chem 251 (organic chem 1) 4	Chem 251 (organic chem 1) 4	Math 152 (calculus 2) 5	EEOB 3410 (intro ecology) 4	EEOB 3410 (intro ecology) 4
Physics 111 (physics 1) 5	Physics 111 (physics 1) 5	Chem 251 (organic chem 1) 4	EEOB 3310 (intro evolution) 4	EEOB 3310 (intro evolution) 4
<u>Unrestricted elective(s) 1 15</u>	<u>Unrestricted elective 1 15</u>	<u>Physics 111 (physics 1) 5 14</u>	Chem 2310 (organic chem) 4	Chem 2310 (organic chem) 4
EEOB 503.01 (intro ecology lecture) 4	EEOB 503.01 (intro ecology lecture) 4	EEOB 503.01 (intro ecology lecture) 4	<u>Physics 1251 (physics 2) 5 17</u>	<u>Physics 1251 (physics 2) 5 17</u>
EEOB 503.02 (intro ecology lab) 2	EEOB 503.02 (intro ecology lab) 2	EEOB 503.02 (intro ecology lab) 2		
Physics 112 (physics 2) 5	Physics 112 (physics 2) 5	Physics 112 (physics 2) 5		
<u>Chem 252 (organic chem 2) 4 15</u>	<u>Chem 252 (organic chem 2) 4 15</u>	<u>Chem 252 (organic chem 2) 4 15</u>		
		<b>Total quarter hours 92</b>		
		<b>Equivalent semester units 61</b>		
MolGen 500 (intro genetics) 5	MolGen 500 (intro genetics) 5	GE 5	GE 5	GE 3
Statistics 245 5	Statistics 245 5	Statistics 2480 3	Statistics 2480 3	Statistics 2480 3
<u>GEC 5 15</u>	<u>GEC 5 15</u>	GE 3	GE 3	GE 3
GEC 5	EEOB 405.01 (intro biodiversity) 4	Unrestricted elective 2	Unrestricted elective 2	GE 3
EEOB 405.01 (intro biodiversity) 4	GEC 5	<u>EEOB biodiversity course 1 2 15</u>	<u>EEOB biodiversity course 1 2 15</u>	<u>EEOB biodiversity course 1 2 14</u>
Unrestricted elective 1	Unrestricted elective 1	GE 4	GE 4	GE 2
<u>GEC 5 15</u>	<u>GEC 5 15</u>	GE 3	GE 3	GE 3
GEC 5	GEC 5	GE 3	GE 3	Unrestricted elective 2
GEC 5	GEC 5	GE 3	GE 3	GE 3
<u>GEC 5 15</u>	<u>GEC 5 15</u>	<u>EEOB biodiversity course 2 2 15</u>	<u>EEOB biodiversity course 2 2 15</u>	<u>EEOB biodiversity course 2 2 14</u>
	<b>Total quarter hours 136</b>			
	<b>Equivalent semester units 91</b>			
EEOB evol/evo core course 5	EEOB biodiversity course 2 2	EEOB advanced evol/evo course 1 3	EEOB advanced evol/evo course 1 3	EEOB advanced evol/evo course 1 3
EEOB elective(s) 4	EEOB advanced evol/evo course 1 3	EEOB quantitative analysis 3	EEOB quantitative analysis 3	EEOB elective(s) 4
<u>GEC 5 14</u>	EEOB advanced evol/evo course 2 4	EEOB elective(s) 6	GE 3	GE 4
EEOB diversity core course 2 5	GE 3	<u>GE 3 15</u>	GE 3	<u>GE 3 14</u>
GEC 5	<u>GE 3 15</u>	EEOB advanced evol/evo course 2 4	<u>GE 3 15</u>	EEOB quantitative analysis 3
<u>GEC 5 15</u>	EEOB quantitative analysis 3	EEOB elective 2	EEOB advanced evol/evo course 2 4	GE 3
EEOB diversity core course 1 3	EEOB elective(s) 5	GE 3	EEOB elective(s) 5	GE 5
EEOB Senior Seminar 3	GE 3	GE 3	<u>GE 3 12</u>	<u>GE 3 14</u>
GEC 5	GE 3	<u>Unrestricted elective(s) 3 15</u>		
<u>GEC 5 16</u>	<u>Unrestricted elective 1 15</u>			
<b>Total hours/units 181</b>	<b>181</b>	<b>121</b>	<b>121</b>	<b>121</b>