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April 5, 2011

To: W. Randy Smith, Vice Provost, Office of Academic Affairs  
From: Terry L. Gustafson, Special Assistant to the Executive Dean for Semester Conversion

Re: Arts and Sciences Program Proposals from the Natural and Mathematical Sciences Division

Arts and Sciences is pleased to submit the following programs from the Natural and Mathematical Sciences Division to the Office of Academic Affairs for conversion from quarters to semesters. The programs have been approved by the faculty members and chair of the originating unit, and reviewed and approved by the divisional advisory panel, a subcommittee of the ASC Committee on Curriculum and Instruction (CCI), and the full CCI. The vote for approval of all programs at the full CCI was unanimous.

Program Name	Academic Plan Code	Conversion Designation	CCI Approval	Last Revision
Astronomy and Astrophysics BS	ASTRON-BS	Converted	4/2/2011	6/12/2009
Astronomy and Astrophysics Minor	ASTRON_MN	Converted	2/28/2011	Prior to 2006
Evolution and Ecology Minor	EVOLECO-MN	Re-envisioned	3/6/2011	Prior to 2006
Microbiology BA	MICRBIO-BA	Re-envisioned	3/15/2011	3/6/2009
Microbiology BS	MICRBIO-BS	Re-envisioned	3/15/2011	3/6/2009
Microbiology Minor	MICROBIO-MN	Re-envisioned	3/11/2011	Prior to 2006
Physics BS	PHYSICS-BS	Converted	4/2/2011	Prior to 2006
Physics Minor	PHYSICS-MN	Converted	3/6/2011	Prior to 2006
Statistics Minor	STAT-MN	Converted	2/21/2011	Prior to 2006
Zoology BA	ZOOLOGY-BA	Re-envisioned	1/31/2011	Prior to 2006
Zoology BS	ZOOLOGY-BS	Re-envisioned	1/31/2011	Prior to 2006
Zoology Minor	ZOOLOGY-MN	Re-envisioned	3/6/2011	Prior to 2006

**Arts and Sciences General Education (GE) Program:** The GE program for untagged B.A. and B.S. degrees in Arts and Sciences was approved by the Council on Academic Affairs on May 26, 2010, after receiving approval from the Arts and Sciences Faculty Senate. All the programs presented here follow the approved GE program.

**College of Arts and Sciences Transition Policy:** The College of Arts and Sciences is committed to the principles outlined in the university's Pledge to Undergraduate Students. Each unit has a plan on how best to assist its majors and minors through the transition. And the Arts and Sciences Academic Advising Services will advise students on how to transition their GE program. Dual advising is the existing process used in Arts and Sciences and will continue under semesters.

Status: PENDING

**PROGRAM REQUEST**  
Zoology - BA

Last Updated: Gustafson, Terry Lee  
04/05/2011

**Fiscal Unit/Academic Org** Evolution, Ecology & Org Bio - D0390  
**Administering College/Academic Group** Arts And Sciences  
**Co-administering College/Academic Group** Biological Sciences  
 Arts And Sciences  
**Semester Conversion Designation** 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)  
**Current Program/Plan Name** Zoology  
**Proposed Program/Plan Name** Zoology - BA  
**Program/Plan Code Abbreviation** ZOOLOGY-BA  
**Current Degree Title** Bachelor of Arts

**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	39	26.0	27	1.0
	Maximum	40	26.7	27	0.3
Required credit hours offered outside of the unit	Minimum	5	3.3	3	0.3
	Maximum	6	4.0	3	1.0
Required prerequisite credit hours not included above	Minimum	43	28.7	39	10.3
	Maximum	43	28.7	39	10.3

**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**

Prerequisite credits increased in other units in the semester system. Under quarters, two courses in Physics were required for a total of 10 credit hours; under semesters, two courses are required for a total of 10 semester units: increase of 3.4 semester units. Biology: 10 credit hours required in quarters system, 8 semester units required in semester system: increase of 1.4 semester units. Chemistry: 3 credit hours of organic chemistry required in quarters system; 4 semester units required in semesters: increase of 2 semester units. Statistics: not required in quarters system, although all students had to take it as a prerequisite to other courses; 3 semester units required in semester system. Increase of 3 semester units.

**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 required 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

- zoology BA docs.pdf  
*(Program Proposal. Owner: Wolfe, Andrea Dayle)*
- Zoology BA major cover letter.doc: NMS Division of Arts and Sciences cover letter  
*(Letter from the College to OAA. Owner: Andereck, Claude David)*
- Subcommittee Chair Letter ZooBSBA.docx: CCI Subcommittee Chair Letter  
*(Other Supporting Documentation. Owner: Vankeerbergen, Bernadette Chantal)*
- NMS Submission Memo.pdf: ASC Cover Letter  
*(Letter from the College to OAA. Owner: Gustafson, Terry Lee)*

Status: PENDING

**PROGRAM REQUEST**  
Zoology - BA

Last Updated: Gustafson, Terry Lee  
04/05/2011

**Comments**

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Wolfe, Andrea Dayle	11/04/2010 09:57 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	11/04/2010 09:58 AM	Unit Approval
Revision Requested	Andereck, Claude David	11/17/2010 12:51 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/02/2010 03:41 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/02/2010 03:43 PM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 10:43 AM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 11:11 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 11:11 AM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 02:01 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 02:50 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 03:25 PM	Unit Approval
Approved	Andereck, Claude David	12/06/2010 05:47 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	12/16/2010 09:51 AM	ASCCAO Approval
Submitted	Wolfe, Andrea Dayle	01/13/2011 01:04 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	01/14/2011 03:31 PM	Unit Approval
Approved	Andereck, Claude David	01/17/2011 01:08 PM	College Approval
Approved	Vankeerbergen, Bernadette Chantal	01/31/2011 10:38 AM	ASCCAO Approval
Approved	Gustafson, Terry Lee	04/05/2011 02:24 PM	ASC Approval
Pending Approval	Soave, Melissa A	04/05/2011 02:24 PM	CAA Approval

College of Arts and Sciences

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January 17, 2011

Larry Krissek  
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the undergraduate Bachelor of Arts major in Zoology under semesters. The major has been re-envisioned from its present quarter version through a significant restructuring of courses, as well as by modifying the goals of the program to include an emphasis on mathematics, statistics and computer modeling. The curriculum map shows that in addition to courses specifically in math and statistics, a significant number of EEOB courses themselves address this learning goal—it is becoming a point of emphasis for the program.

Beyond my own review of the documents, the proposal has been discussed by colleagues from other NMS units at a meeting on November 17, 2010. Feedback from the discussions (and from the CCI Sciences Subcommittee) 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



Department of Microbiology

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January 24, 2011

Professor Larry Krissek  
Chair, Arts and Sciences CCI  
Re: Zoology BS and BA

Dear Professor Krissek:

At the December 15, 2010 meeting of the Mathematics and Social, Behavioral, and Natural Sciences CCI Subcommittee the semester conversion plans for the Zoology BS and BA programs, submitted by the Department of Evolution, Ecology, Organismal Biology (EEOB), were reviewed.

In preparation for the transition to semesters, EEOB initiated reviews of all areas of research and teaching covered in the department. These reviews resulted in revised learning goals and course restructuring that impacted both undergraduate and graduate programs; consequently, the BS and BA programs in Zoology were presented as re-envisioned.

Under the semester schemes for these degrees, students will satisfy requirements in five core areas: evolution, ecology, genetics, biodiversity, and organismal biology; a sixth topic area, cellular and developmental physiology, was dropped from the semester core. The first three areas (evolution, ecology and genetics) are satisfied by a required core and students can choose from a wide range of courses to meet the requirements in the remaining two areas. The Zoology BS and BA degree programs have slightly reduced requirements for mathematics and organic chemistry under semesters; in both areas a two-quarter series required under quarters will be replaced by a one-semester course during semesters. Both semester programs will however, require one-semester of statistics. BS and BA programs are closely related, with the BA program differing only in its supportive mathematics requirement.

The committee felt that the proposals were carefully prepared and covered all of the essential topics. We requested a few minor text revisions for clarification, and we unanimously approved both proposals for the next step in the approval process.

Sincerely,

Charles J. Daniels, Ph.D.  
Professor  
Acting Subcommittee Chair for Dec. 15



Department of Evolution, Ecology, and Organismal Biology

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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 Zoology Major - BA**

The Department of Evolution, Ecology, and Organismal Biology (EEOB) currently offers a BS and BA in Zoology. Under semesters, EEOB will continue to offer both options for the Zoology major. Changes to the Zoology BA major are summarized below.

Under semesters, the BA requirements will remain largely the same as they were under quarters, except that we have been obliged to increase slightly the requirements in biology, physics, and chemistry from two quarters each to two semesters each. These changes were necessitated by the fact that (a) the two-quarter biology sequence has been replaced by a two semester sequence, (b) physics does not plan to offer a semester equivalent to the combination of Physics 111 and 112, and (c) chemistry does not plan to offer a semester equivalent to the combination of Chem 121 and 122. The new BA requirements also make explicit the previously implicit requirement for a one-semester course in statistics. (Under the quarter system, the GEC requirements for a BA – but not the BS – included a data analysis course, which, for our students, was almost always satisfied by taking Stat 145.) Summarizing, the required supportive courses for the BA in Zoology are as follows: two semesters of introductory biology (BIOL 1113 and 1114), one course in college-level math (MATH 1148), two semesters of introductory chemistry (CHEM 1210, 1220), one course in organic chemistry (CHEM 2310), two semesters of physics (PHYSICS 1106 & 1107, or 1250 & 1251), and one course in introductory statistics (STAT 1450).

### **Zoology Major – BA**

The Department of Evolution, Ecology, and Organismal Biology (EEOB) currently offers a BA undergraduate major program in Zoology. The Zoology major is appropriate for students in the natural sciences whose main interests lie in animals and who wish to find employment working with animals, for students desiring to teach at the K-12 level, and for students planning to enter certain Masters-level graduate programs in organismal biology.

The structure of the Zoology major under semesters will be largely the same as under quarters, but under semesters students will have greater flexibility in satisfying the requirements in the different core areas in the major. The five core areas for the Zoology major are evolution, ecology, genetics, biodiversity, and organismal biology (previously called “form and function”). Under quarters there was a sixth area (cellular and developmental physiology), but we have dropped this from the core. For each of the first three core areas there is, as before, basically only one course (or honors version thereof) that will satisfy the requirement (Evolution: EEOB 3310; Ecology: EEOB 3410; and General Genetics: MOLGEN 4500). However, for the other two areas, biodiversity and organismal biology, students may now choose from a variety of courses. Students must take two courses in biodiversity from among seven possibilities and must take two in organismal biology from among six possibilities. Under quarters, these two requirements could be satisfied only by particular courses (Diversity and Systematics of Organisms: EEOB 405; and Animal Form and Function: EEOB 410); thus, student choice has been enhanced. 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 have a substantial biology component. Most courses in Biological Sciences (*sensu obsoletu*) are acceptable, as well as certain courses from other departments (e.g., Animal Science, Anthropology, Earth Sciences, Environment & Natural Resources, Human Nutrition, Physiology & Cell Biology, Psychology). Students will need to check with their EEOB Zoology advisor if they have any question about 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**

### **Zoology Major – BA**

Students who have declared the BA Zoology 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.

Potential problems in transition can arise in fulfilling the BA requirements if a student is partway through a two- or three-quarter sequence in supportive course requirements (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, 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 Zoology BA 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 1148	College Algebra	4	MATH 148	5	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	Organic Chem	4	CHEM 231	3	1 semester organic chem required for majors	4
<b>Physics</b>	PHYSICS 1106 & 1107 OR 1250 & 1251	Introductory or General Physics	10	PHYSICS 111, 112	10	1250H & 1251H also accepted	4
<b>Statistics</b>	STAT 1450	Intro Stats	3			Was not required in quarters system	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	3	MOLGEN 500	5		1*,2*,3*

**Elective courses in Biodiversity (choose two)**

	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	2-4		EEOB 470	5	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*
	EEOB 4220	E&E Mammals	2-4		EEOB 625	5	Similar or enhanced content (if taught as 14 week course)	1*,2*,3*,4*
	EEOB 4230	E&E Invertebrates	2-4				New course	1*,2*,3*,4*
	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*

**Elective courses in Organismal Biology (choose two)**

	EEOB 2510	Human Anatomy	3		EEOB 235	5	Similar content	3,4
	EEOB 3510	Cell Dev Biol	3		EEOB 415	4	Enhanced content	1,3*,7
	EEOB 4510	Comp Vert Anat	3		EEOB 512	2	Enhanced content	1*,3*,6*
	EEOB 4520	Comp Physiology	3		EEOB 410	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*

**Elective courses in EEOB that could count toward major (up to 10 semester units)**

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, same content	1,2,3,4,6,7
	EEOB 2220	Ohio Birds	2		EEOB 322	5	7-week course, same content	1,2,3,4,6,7
	EEOB 2250	Dyn Dinosaurs	1.5		EEOB 350	3	7-week course, same 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
	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
	EEOB 3510	Cell Dev Biol	3		EEOB 415	4	Enhanced content
	EEOB 3520	Micro Anatomy	1.5		EEOB 630	5	New course title (changed from Vertebrate Histology), similar content as previous course
	EEOB 3797	UG Foreign study			EEOB 697		
	EEOB 3798	UG Study Tour			EEOB 698		
	EEOB 3998	UG Research	1-12		EEOB 699		
	EEOB 3999	UG Thesis Res	1-5				
	EEOB 4210	E&E Vertebrates	2-4		EEOB 470	5	Similar or enhanced content (if taught as 14 week class)
	EEOB 4220	E&E Mammals	2-4		EEOB 625	5	Similar or enhanced content (if taught as 14 week class)
	EEOB 4230	E&E Invertebrates	2-4				New course
	EEOB 4240	E&E Plants People	2-4		EEOB 502	4	Similar or enhanced content (if taught as 14 week class)
	EEOB 4410	Conserv Biol	3		EEOB 661	5	Similar content
	EEOB 4420	Trop Field Studies	2		EEOB 557H	3	Similar content
	EEOB 4430	Ecol Methods I	1-2				New course
	EEOB 4510	Comp Vert Anat	3		EEOB 512	2	Enhanced content
	EEOB 4520	Comp Physiology	3		EEOB 410	4	New course title, enhanced content from previous course
	EEOB 4520-H	Comp Physio - H	3		EEOB 410H	4	New course title, enhanced content from previous course
	EEOB 4550	Neurobio Behavior	3		EEOB 632	3	New course title, enhanced content from previous course
	EEOB 4560	Endocrinology	2		EEOB 550	3	Same content
	EEOB 4910	Plants Tch SL	2		EEOB 511	3	Summer course at Stone Lab
	EEOB 4920	Birds Tch SL	2		EEOB 522	3	Summer course at Stone Lab

	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 5189	Field Work	1-4		EEOB 510 EEOB 513 EEOB 622 EEOB 651 EEOB 657	5 3 3 5 5	One course title to cover all of our field-oriented courses; topical emphasis to be announced with each offering	
	EEOB 5310	Adv Evolution	3		EEOB 673	5	New course title, same 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	1.5-3		EEOB 505	5	New course title, same content as previous course	2**,3*,5*
	EEOB 5420	Ecol Inland Waters	1.5-3		EEOB 647 EEOB 655	5 5	Combines the content of two courses (Plankton and Limnology), and eliminates curricular content duplication	2**,3*,5*
	EEOB 5430	Fish Ecology	1.5-3		EEOB 626 EEOB 621	5 5	Combines the content of two courses (Biology of Fishes and Ichthyology), and eliminates curricular content duplication	2**,3*,5*
	EEOB 5450	Popul Ecology	3		EEOB 671	5	Similar 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.

Zoology Major Program  
Bachelor of Arts

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

**Required Supporting Courses**

- |  |  |
|--|--|
| <p><b>Biology (2 courses)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Biology 1113 or 1113H (4 hr)</li> <li><input type="checkbox"/> Biology 1114 or 1114H (4 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> <p><b>Mathematics (1 course)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Math 1148 (4 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> <p><b>Physics (2 courses)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Physics 1106 and 1107 (5 hr)</li> <li><input type="checkbox"/> Physics 1250 and 1251 (5 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> | <p><b>Chemistry (2 courses)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Chemistry 1210 (5 hr)</li> <li><input type="checkbox"/> Chemistry 1220 (5 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> <p><b>Organic Chemistry (1 course)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Chemistry 2310 (4 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> <p><b>Statistics (1 course)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Statistics 1450 (3 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> <li><input type="checkbox"/> Waived</li> </ul> |
|--|--|

**Core Courses**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> EEOB 3310 (4 hr)</li> <li><input type="checkbox"/> EEOB 3410 (4 hr)</li> <li><input type="checkbox"/> MolGen 4500 (3 hr)</li> <li><input type="checkbox"/> _____ Substitution</li> </ul> | <p><b>Biodiversity (any 2)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> EEOB 2220 (2 hr)</li> <li><input type="checkbox"/> EEOB 3320 (3 hr)</li> <li><input type="checkbox"/> EEOB 4210 (2 hr)</li> <li><input type="checkbox"/> EEOB 4220 (2 hr)</li> <li><input type="checkbox"/> EEOB 4230 (2 hr)</li> <li><input type="checkbox"/> EEOB 4410 (3 hr)</li> <li><input type="checkbox"/> EEOB 4420 (2 hr)</li> </ul> <p><b>Organismal Biology (any 2)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> EEOB 2510 (3 hr)</li> <li><input type="checkbox"/> EEOB 3510 (3 hr)</li> <li><input type="checkbox"/> EEOB 4510 (3 hr)</li> <li><input type="checkbox"/> EEOB 4520 (3 hr)</li> <li><input type="checkbox"/> EEOB 4550 (3 hr)</li> <li><input type="checkbox"/> EEOB 4560 (2 hr)</li> </ul> |
|--|--|

**Electives**

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

Advisor (Printed) \_\_\_\_\_  
Advisor (Signature) \_\_\_\_\_  
Date \_\_\_\_\_



## Zoology Major Program (BA)

The zoology major introduces students to the major areas of zoology (the core courses) and allows them to pursue their particular interests (elective courses).

### Part A. Required Supportive Courses (Do not count toward the 45 hour major)

Courses	Hours
<input type="checkbox"/> Biology 113 (H115), 114 (H116)	10
<input type="checkbox"/> Mathematics 148	5
<input type="checkbox"/> Chemistry 121, 122, 123	15
<input type="checkbox"/> Chemistry 231	3
<input type="checkbox"/> Physics 111, 112	10

### Part B. Core Requirements

Courses	Hours
<input type="checkbox"/> Evolution EEOB 400	5
<input type="checkbox"/> Diversity and Systematics EEOB 405.01 and 405.02	6
<input type="checkbox"/> Ecology EEOB 503.01	4
<input type="checkbox"/> Form and Function EEOB 410 or H410	4
<input type="checkbox"/> Cell and Development EEOB 415 or H415, or Molecular Genetics 606 and 607	04-06
<input type="checkbox"/> Molecular Genetics Molecular Genetics 500, or 605 and 606	05-06

### Part C. Electives

A **minimum** of 29 hours of zoology courses taught in EEOB, including core courses, is required. A list of acceptable courses is available in the EEOB office. These courses should be chosen in consultation with your zoology advisor. A **maximum** of 16 hours of courses outside EEOB that are relevant to zoology is permitted (including core requirements). These courses must be approved by your zoology advisor.

**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 (parts B and C)

A more detailed handout describing the zoology major is available from the EEOB office in Room 300 Aronoff. For more information about the zoology major, contact:

Prof. W. Mitchell Masters, Undergraduate  
Coordinating Advisor in Zoology  
286 Aronoff Lab  
318 West 12th Ave.  
to schedule an appointment, email  
[masters.2@osu.edu](mailto:masters.2@osu.edu) or call 614-292-4602

or

Prof. Meg Daly, Honors Advisor  
1552 Museum of Biological Diversity  
1315 Kinnear Road  
to schedule an appointment, email [daly.66@osu.edu](mailto:daly.66@osu.edu)  
or call 614-247-8412

see also: <http://www.biosci.ohio-state.edu/~eeob/>

## EEOB Zoology Major (BA)

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
BioSci 100 (biology survey) 1	BioSci 100 (biology survey) 1	BioSci 100 (biology survey) 1	BioSci 100 (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
GEC 5	GEC 5	GEC 5	Unrestricted elective(s) 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	Chem 1220 (chemistry 2) 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>	GE 3
GEC 5	GEC 5	GEC 5	GEC 5	Biology 1114 (intro bio 2) 4
Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	<u>Unrestricted elective 3 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>	<u>Biology 114 (intro bio 2) 5 15</u>	
			<b>Total quarter hours 46</b>	
			<b>Equivalent semester units 31</b>	
EEOB 400 (intro evolution) 5	EEOB 400 (intro evolution) 5	EEOB 400 (intro evolution) 5	EEOB 3310 (intro evolution) 4	EEOB 3310 (intro evolution) 4
GEC 5	GEC 5	GEC 5	Physics 1106 (intro physics 1) 5	Physics 1106 (intro physics 1) 5
<u>GEC 5 15</u>	<u>GEC 5 15</u>	<u>GEC 5 15</u>	Chem 2310 (organic chem) 4	Chem 2310 (organic chem) 4
MolGen 500 (intro genetics) 5	MolGen 500 (intro genetics) 5	MolGen 500 (intro genetics) 5	<u>Unrestricted elective 2 15</u>	<u>Unrestricted elective 2 14</u>
Physics 111 (physics 1) 5	Physics 111 (physics 1) 5	Physics 111 (physics 1) 5	EEOB 3410 (intro ecology) 4	EEOB 3410 (intro ecology) 4
<u>Unrestricted elective(s) 5 15</u>	<u>Unrestricted elective(s) 5 15</u>	<u>Unrestricted elective(s) 5 15</u>	Mol Gen 4500 (intro genetics) 3	Mol Gen 4500 (intro genetics) 3
EEOB 405.01 (intro biodiversity lec) 4	EEOB 405.01 (intro biodiversity lec) 4	EEOB 405.01 (intro biodiversity lec) 4	Physics 1107 (intro physics 2) 5	Physics 1107 (intro physics 2) 5
EEOB 405.02 (intro biodiversity lab) 2	EEOB 405.02 (intro biodiversity lab) 2	EEOB 405.02 (intro biodiversity lab) 2	<u>GE 3 15</u>	<u>GE 3 15</u>
Physics 112 (physics 2) 5	Physics 112 (physics 2) 5	Physics 112 (physics 2) 5		
<u>Chem 231 (intro organic chem) 3 14</u>	<u>Chem 231 (intro organic chem) 3 14</u>	<u>Chem 231 (intro organic chem) 3 14</u>		
		<b>Total quarter hours 90</b>		
		<b>Equivalent semester units 60</b>		
EEOB 410 (comparative physiology) 4	EEOB 410 (comparative physiology) 4	EEOB biodiversity course 2 2	GE foreign language 1102.05 5	GE 4
Statistics 145 5	Statistics 145 5	Statistics 1450 3	Statistics 1450 3	Statistics 1450 3
GEC 5	GEC 5	GE 3	GE 3	GE 3
<u>Unrestricted elective 2 16</u>	<u>Unrestricted elective 2 16</u>	GE 3	EEOB biodiversity course 1 2	EEOB biodiversity course 1 2
EEOB 415 (cell physiology & devel) 4	EEOB 415 (cell physiology & devel) 4	<u>Unrestricted elective(s) 4 15</u>	<u>Unrestricted elective 2 15</u>	<u>GE 3 15</u>
EEOB elective 2	EEOB elective 2	EEOB comp physiology course 1 3	EEOB biodiversity course 2 2	EEOB biodiversity course 2 2
GEC 5	GEC 5	EEOB elective 2	EEOB comp physiology course 1 3	EEOB comp physiology course 1 3
<u>Unrestricted elective(s) 4 15</u>	<u>Unrestricted elective(s) 4 15</u>	GE 3	GE 4	GE 4
EEOB 503.01 (intro ecology lecture) 4	EEOB 503.01 (intro ecology lecture) 4	GE 3	GE 3	GE 3
GEC 5	GEC 5	GE 3	<u>GE 3 15</u>	<u>GE 3 15</u>
<u>Unrestricted elective(s) 6 15</u>	<u>Unrestricted elective(s) 6 15</u>	<u>Unrestricted elective 1 15</u>		
	<b>Total quarter hours 138</b>			
	<b>Equivalent semester units 91</b>			
EEOB elective(s) 5	EEOB elective(s) 4	EEOB comp physiology course 2 3	EEOB comp physiology course 2 3	EEOB comp physiology course 2 3
GEC 5	GE 3	EEOB elective(s) 4	EEOB elective(s) 4	EEOB elective(s) 4
<u>GEC 5 15</u>	GE 3	GE 3	GE 3	GE 4
GEC 5	GE 4	GE 3	GE 3	GE 3
EEOB elective(s) 5	<u>Unrestricted elective 1 15</u>	<u>Unrestricted elective 3 16</u>	<u>Unrestricted elective(s) 2 15</u>	<u>Unrestricted elective 1 15</u>
<u>GEC 5 15</u>	EEOB comp physiology course 2 3	EEOB elective(s) 5	EEOB elective(s) 5	EEOB elective(s) 5
GEC 5	EEOB elective(s) 5	GE 3	GE 3	GE 3
EEOB elective(s) 5	GE 3	<u>Unrestricted elective(s) 7 15</u>	GE 3	GE 3
<u>GEC 5 15</u>	GE 3		GE 3	<u>Unrestricted elective(s) 4 15</u>
	<u>Unrestricted elective 1 15</u>		<u>Unrestricted elective 1 15</u>	
<b>Total hours/units 181</b>	<b>121</b>	<b>121</b>	<b>121</b>	<b>121</b>