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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 - BS

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 - BS
Program/Plan Code Abbreviation	ZOOLOGY-BS
Current Degree Title	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	40	26.7	27	0.3
	Maximum	40	26.7	27	0.3
Required credit hours offered outside of the unit	Minimum	5	3.3	3	0.3
	Maximum	5	3.3	3	0.3
Required prerequisite credit hours not included above	Minimum	61	40.7	40	0.7
	Maximum	61	40.7	40	0.7

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 bs docs.pdf
(Program Proposal. Owner: Wolfe, Andrea Dayle)
- Zoology BS 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 - BS

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

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Wolfe, Andrea Dayle	11/02/2010 04:30 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	11/02/2010 04:31 PM	Unit Approval
Revision Requested	Andereck, Claude David	11/17/2010 12:51 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/02/2010 11:05 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/02/2010 11:07 AM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 10:35 AM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 11:00 AM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 11:01 AM	Unit Approval
Revision Requested	Andereck, Claude David	12/06/2010 02:01 PM	College Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 02:38 PM	Submitted for Approval
Revision Requested	Wolfe, Andrea Dayle	12/06/2010 02:39 PM	Unit Approval
Submitted	Wolfe, Andrea Dayle	12/06/2010 02:41 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	12/06/2010 03:25 PM	Unit Approval
Approved	Andereck, Claude David	12/06/2010 05:40 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	12/16/2010 09:52 AM	ASCCAO Approval
Submitted	Wolfe, Andrea Dayle	01/10/2011 01:44 PM	Submitted for Approval
Approved	Wolfe, Andrea Dayle	01/10/2011 01:44 PM	Unit Approval
Approved	Andereck, Claude David	01/13/2011 11:02 AM	College Approval
Approved	Vankeerbergen, Bernadette Chantal	01/31/2011 10:39 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 13, 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 Science 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 this discussion (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 - BS

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 BS major are summarized below.

Under semesters, the BS requirements will remain largely the same as they were under quarters, except that we have slightly reduced the mathematics and organic chemistry requirements from two quarters to one semester. For students on a pre-professional track (e.g., planning to enter medical school), a two-semester organic chemistry sequence (with lab) will be recommended as well as a semester of biochemistry, but we will not require this of all students. In addition to these changes, we have added a one-semester requirement in statistics. Summarizing, the required supportive courses for the BS in Zoology are as follows: two semesters of introductory biology (BIOL 1113 and 1114), one course in calculus (MATH 1151 or 1156), two semesters of introductory chemistry (CHEM 1210, 1220), one course in organic chemistry (CHEM 2310), two semesters of physics (PHYSICS 1250 and 1251), and one course in introductory statistics (STAT 2450 or 2480).

Zoology Major – BS

The Department of Evolution, Ecology, and Organismal Biology (EEOB) currently offers a BS undergraduate major program in Zoology. The Zoology major is appropriate for students in the natural sciences whose main interests lie in animals, for students desiring a pre-professional program, and for students planning to enter a graduate program 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 from 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 – BS

Students who have declared the BS 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. The only potential difficulty is the new requirement for a statistics course among the required supportive courses for the Zoology major. If a student who started under the old system wants to fulfill the new degree requirements but finds it too 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 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 BS 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
Biology	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
Math	MATH 1151	Calculus 1	5	MATH 151,152	10	MATH 1156 also accepted	5
				MATH 148,150	10		
General Chem	CHEM 1210,1220	General Chem	10	CHEM 121,122,123	15	2 semesters of general chemistry required for program	4
Organic Chem	CHEM 2310 or CHEM 2510	Organic Chem	4	CHEM 251,252	6	1 semester organic chem required for majors; pre-professional track advised to take 2 semesters plus one semester of biochemistry	4
Physics	PHYSICS 1250 & 1251	General Physics	10	PHYSICS 111, 112 or 131, 132	10	1250H & 1251H also accepted	4
Statistics	STAT 2480	Statistics for Life Sciences	3			STAT 2450 also accepted	5

Required core courses

	EEOB 3310 or 3310H	Evolution	4	EEOB 400 or 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, 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			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	1*,2*,3*,4*
	EEOB 4220	E&E Mammals	2-4		EEOB 625	5	Similar or enhanced content	1*,2*,3*,4*
	EEOB 4230	E&E Invertebrates	2-4				New course	1*,2*,3*,4*
	EEOB 4240	E&E Plants People	2-4		EEOB 502	4	Similar or enhanced content	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	1-2				New course	2*,3*,5
	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 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 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	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, as well as 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 Science

Name _____
Semester of Graduation _____

Required Supporting Courses

- | | |
|--|---|
| <p>Biology (2 courses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Biology 1113 or 1113H (4 hr) <input type="checkbox"/> Biology 1114 or 1114H (4 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived <p>Mathematics (1 course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Math 1151 or 1156 (5 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived <p>Physics (2 courses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Physics 1250 or 1250H (5 hr) <input type="checkbox"/> Physics 1251 or 1251H (5 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived | <p>Chemistry (2 courses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Chemistry 1210 (5hr) <input type="checkbox"/> Chemistry 1220 (5 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived <p>Organic Chemistry (1 course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Chemistry 2310 (4 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived <p>Statistics (1 course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Statistics 2480 or 2450 (3 hr) <input type="checkbox"/> _____ Substitution <input type="checkbox"/> Waived |
|--|---|

Core Courses

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

Electives

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

Advisor (Printed) _____
Advisor (Signature) _____
Date _____

Zoology Major Program (BS)

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 151, 152	10
<input type="checkbox"/> Chemistry 121, 122, 123	15
<input type="checkbox"/> Chemistry 231	4
<input type="checkbox"/> Physics 111 (131), 112 (132)	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	4
<input type="checkbox"/> Molecular Genetics Molecular Genetics 500	5

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 or call 614-292-4602

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

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

EEOB Zoology 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
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
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	GE 3
Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	Chem 122 (chemistry 2) 5	<u>Biology 1114 (intro bio 2) 4 17</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>	
			Total quarter hours 46	
			Equivalent semester units 31	
Chem 123 (chemistry 3) 5	Chem 123 (chemistry 3) 5	Chem 123 (chemistry 3) 5		Math 1151 (calculus 1) 5
Math 151 (calculus 1) 5	Math 151 (calculus 1) 5	Math 151 (calculus 1) 5	Math 1151 (calculus 1) 5	EEOB 3310 (intro evolution) 4
<u>EEOB 400 (intro evolution) 5 15</u>	<u>EEOB 400 (intro evolution) 5 15</u>	<u>EEOB 400 (intro evolution) 5 15</u>	Chem 123T (transition course) 3	<u>Physics 1250 (physics 1) 5 14</u>
Math 152 (calculus 2) 5	Math 152 (calculus 2) 5	Math 152 (calculus 2) 5	Physics 1250 (physics 1) 5	EEOB 3410 (intro ecology) 4
Chem 251 (organic chem 1) 4	Chem 251 (organic chem 1) 4	Chem 251 (organic chem 1) 4	<u>Unrestricted elective 2 15</u>	Mol Gen 4500 (intro genetics) 3
<u>Physics 111 (physics 1) 5 14</u>	<u>Physics 111 (physics 1) 5 14</u>	<u>Physics 111 (physics 1) 5 14</u>	EEOB 3410 (intro ecology) 4	Chem 2310 (organic chem) 4
EEOB 405.01 (intro biodiversity lec) 4	EEOB 405.01 (intro biodiversity lec) 4	EEOB 405.01 (intro biodiversity lec) 4	EEOB 3310 (intro evolution) 4	<u>Physics 1251 (physics 2) 5 16</u>
EEOB 405.02 (intro biodiversity lab) 2	EEOB 405.02 (intro biodiversity lab) 2	EEOB 405.02 (intro biodiversity lab) 2	Chem 2310 (organic chem) 4	
Physics 112 (physics 2) 5	Physics 112 (physics 2) 5	Physics 112 (physics 2) 5	<u>Physics 1251 (physics 2) 5 17</u>	
<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>		
		Total quarter hours 90		
		Equivalent semester units 60		
MolGen 500 (intro genetics) 5	MolGen 500 (intro genetics) 5		GE 5	GE 3
EEOB 410 (comparative physiology) 4	EEOB 410 (comparative physiology) 4	Mol Gen 4500 (intro genetics) 3	Statistics 2480 3	Statistics 2480 3
GEC 5	GEC 5	GE 5	GE 3	GE 3
<u>Unrestricted elective 1 15</u>	<u>Unrestricted elective 1 15</u>	Statistics 2480 3	<u>Mol Gen 4500 (intro genetics) 3 14</u>	GE 3
GEC 5	GEC 5	GE 3	GE 4	<u>EEOB biodiversity course 1 2 14</u>
EEOB 415 (cell physiology & devel) 4	EEOB 415 (cell physiology & devel) 4	<u>EEOB biodiversity course 1 2 16</u>	EEOB comparative physiology 1 3	GE 4
EEOB elective 2	EEOB elective 2	GE 4	GE 3	EEOB comparative physiology 1 3
<u>GEC 5 16</u>	<u>GEC 5 16</u>	EEOB comparative physiology 1 3	<u>EEOB biodiversity course 1 2 15</u>	GE 3
GEC 5	GEC 5	GE 3	EEOB biodiversity course 2 2 15	<u>EEOB biodiversity course 2 2 15</u>
GEC 5	GEC 5	GE 3		
<u>GEC 5 15</u>	<u>GEC 5 15</u>	<u>EEOB biodiversity course 2 2 15</u>		
	Total quarter hours 136			
	Equivalent semester units 91			
EEOB 503.01 (intro ecology lecture) 4	EEOB elective(s) 4	EEOB comparative physiology 2 3	EEOB biodiversity course 2 2	GE 3
EEOB elective(s) 5	GE 3	EEOB elective(s) 4	EEOB elective(s) 4	EEOB elective(s) 4
GEC 5	GE 3	GE 3	GE 3	GE 4
<u>Unrestricted elective 1 15</u>	<u>Unrestricted elective 1 15</u>	GE 3	GE 3	<u>EEOB comparative physiology 2 3 14</u>
EEOB elective(s) 5	EEOB comparative physiology 2 3	<u>Unrestricted elective(s) 2 15</u>	<u>GE 3 15</u>	EEOB elective(s) 3
GEC 5	EEOB elective(s) 5	EEOB elective(s) 5	EEOB comparative physiology 2 3	GE 3
<u>GEC 5 15</u>	GE 3	GE 3	EEOB elective(s) 5	GE 3
EEOB elective(s) 5	GE 3	GE 3	GE 3	GE 3
GEC 5	<u>Unrestricted elective 1 15</u>	<u>Unrestricted elective(s) 4 15</u>	<u>GE 3 14</u>	<u>Unrestricted elective(s) 2 14</u>
<u>GEC 5 15</u>				
Total hours/units 181	121	121	121	121