The University of Georgia

University Council
Athens, Georgia 30602

February 6, 2015

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Dear Colleagues:

The attached proposal to offer the existing major in Ecology under the Bachelor of Arts (A.B.) degree will be an agenda item for the February 13, 2015, Full University Curriculum Committee meeting.

Sincerely,

William K. Vencill

William K. Vencill, Chair
University Curriculum Committee

cc: Provost Pamela S. Whitten
Dr. Laura D. Jolly

Proposal for an A.B. Degree in Ecology 27 January 2015

The Odum School of Ecology is seeking approval for a degree change to implement a Bachelor of Arts degree in Ecology. This degree will complement the existing Bachelor of Science program, and the two programs will share 21 hours of major-level courses.

The current Bachelor of Science program in Ecology provides excellent preparation for students who anticipate careers performing analytical and experimental work in Ecology. Our past students have been admitted to competitive graduate programs around the country and abroad or have pursued science-based careers with environmental NGOs and governmental agencies. But we have also been aware that some students with an interest in Ecology plan careers that focus more on the societal interface. Examples of these career tracks include environmental law, science journalism, sustainability officers for corporations, public affairs specialists in government agencies or NGOs, and environmental consulting firms and policy work in organizations such as the Environmental Protection Agency. These students need different academic preparation, which is why we are creating a Bachelor of Arts in Ecology degree.

The educational paradigm proposed here will be the first of its kind in the U.S., and its establishment provides an opportunity to attract new students to the University of Georgia. Unlike other applied ecology programs, which often treat environmental dilemmas as fragmented problems in isolation from other disciplines, or at least largely ignore their social context, our program will focus on the problem-solving process and will thus impart skills that can be used universally. We see our students as a new cadre of professionals who will help decision makers and stakeholders work more effectively with the scientific research community and vice versa. This role is as important to the applied research scientist who needs help in identifying the type of research that is most relevant and beneficial to the public as it is for the elected officials who need to understand the ecological impacts of various choices before them.

What are the hallmarks that distinguish the A.B. from the B.S. degree? The proposed A.B. has an emphasis on interdisciplinarity (especially between the natural and the social sciences), experiential learning, communication and group skills—in the context of understanding the environment to solve problems. Our program builds upon a strong core of Ecology courses that are shared with the existing B.S. degree and adds courses that allow students to consider human dimensions of ecological issues and become better equipped to synthesize and communicate challenges and solutions. Students are encouraged to develop problem solving and communication skills through experiential learning. One example of this is a new field course where students will travel through Georgia in order to be guided in their understanding of the human activities that impact the landscape. For example, a site visit in West Georgia could focus on the impact of the carpet industry on the local environment. There students can perform stream surveys of water quality and biodiversity and speak with local watershed protection groups as well as representatives from the carpet industry to gain multiple perspectives on the local economy and environmental concerns. Pioneers in green industry, such as the Interface Corporation, can give students firsthand experience with novel approaches to dealing with environmental

issues related to carpet manufacturing. These types of field experiences will provide the foundation for problem-solving activities that will be completed in the new Environmental Practicum course we will create for A.B. students.

We believe this new program will advance the goals of the university for experiential learning. Although study abroad is not a required part of the program, we support the university's efforts and would encourage A.B. students to gain international experience.

Approximately one third of the current Bachelor of Science students in Ecology are pursuing dual degree programs of study. In the Bachelor of Arts degree, we would continue to encourage students to seek dual degrees to help them meet their career objectives and have specifically designed our requirements with the flexibility to allow students to pursue dual degrees.

Structure of the A.B. in Ecology Program

Students seeking a Bachelor of Arts in Ecology must have a strong foundation in ecological science. This foundation comes from 21 hours of major-level as well as 12 hours of science and math courses taken in Core areas I-II. Courses in Area VI and in major electives are the major differences in degree requirements. A comparison of the two programs is found in Table 1. Courses that fulfill the Natural History requirement, Methods or Skills requirement, and Major Electives are listed in Table 2.

Enrollment Projections

We estimate the number of students seeking this degree at about 15-20 students per year, for a total of 60-80 students in the program.

Resources Needed

The Odum School is not requesting any additional university funds to implement the A.B. degree program.

Courses

We currently have the capacity or ability to expand enrollment in all of the ECOL courses that are required for this major. Funds needed to support additional GLAs for any required laboratories would be generated through increased credit hour enrollment. Two laboratories in the new Science Learning Center will be used for students in ECOL 1000L and ECOL 3500-3500L classes. Computer facilities in the Odum School as well as a mobile cart with tablet computers are available to support technological needs in the classroom.

Two new courses are proposed as part of the A.B. degree. Both are under development and will be submitted through CAPA once the degree approval is obtained. These courses are an important part of the program and enhance the experiential learning of students seeking this degree.

a. Field course: The new field course would be offered as a Maymester program. There would be travel costs (bus, lodging, and meals) associated with the course

and we would seek funding from foundations to defray some of the expenses. There would be a course fee to cover course expenses not provided through grants. Any students enrolling in the degree program would be made aware of the cost and encouraged to plan for it.

b. Environmental Practicum- Modest travel and project costs would be associated with this course and supported through Odum School funds.

Faculty time commitments

1. A.B. Faculty Coordinator- This new program requires a faculty member to develop contacts for internships and other experiential learning activities. This person would also be involved in teaching a course within the program such as ECOL 1000 or ECOL 3500-3500L. A senior lecturer position in our unit has long been tasked with coordination of the undergraduate B.S. degree program. Our plan is to have this position be primarily responsible for overseeing the A.B. degree program and to shift responsibility for the B.S. degree program to another faculty member in our unit starting in fall 2015.
2. Field course instructor- The field course will take a significant amount of effort to organize and teach. During fall 2015, we will review teaching responsibilities in our unit and expect to assign this field course as part of the instructional effort for one of our recent hires.
3. Practicum course instructor- Dr. Laurie Fowler currently teaches a graduate-level Environmental Practicum course. She has agreed to teach the A.B. practicum course with content area support from other Ecology faculty.

Comparison of the B.S. and A.B. degree programs in Ecology

The following table shows the key required courses in the A.B. in Ecology and the B.S. degree requirements. Courses shown in **BOLD** are required for the Bachelor of Arts degree but not for the Bachelor of Science degree.

Requirement	B.S. Degree (Existing)	A.B. Degree (Proposed)
Core Area I	ENGL 1101 – English Composition I	ENGL 1101 – English Composition I
	ENGL 1102 – English Composition II	ENGL 1102 – English Composition II
	MATH 1113 – Precalculus	MATH 1113 – Precalculus
Core Area II	CHEM 1211, CHEM 1211L – Freshman Chemistry I and Lab	CHEM 1211, CHEM 1211L – Freshman Chemistry I and Lab
	BIOL 1107, BIOL 1107L – Principles of Biology I and Lab	BIOL 1107, BIOL 1107L – Principles of Biology I and Lab
Core Area III	MATH 2250 – Calculus I for Science and Engineering	MATH 2250 – Calculus I for Science and Engineering (Preferred)
Core Area IV	World Languages and Culture (Foreign Language), 9 hours	World Languages and Culture (Foreign Language), 9 hours
	Humanities and the Arts, 3 hours	Humanities and the Arts, 3 hours
Core Area V	Social Sciences, 9 hours	Social Sciences, 9 hours
Core Area VI	BIOL 1108, BIOL 1108L– Principles of Biology II and Lab	BIOL 1108, BIOL 1108L– Principles of Biology II and Lab
	CHEM 1212, CHEM1212L – Freshman Chemistry II and Lab	**ECOL 1000, ECOL 1000L – Ecological Basis of Environmental Issues and Lab**
	CHEM 2211, CHEM 2211L – Modern Organic Chemistry I and Lab	**ECOL 2100 – Global Climate Change: Past, Present, and Future**
	PHYS 1111-1111L – Introductory Physics-Mechanics, Waves, and Thermodynamics	**AAEC 2580 – Applied Microeconomics Principles <u>or</u> ECON 2106 – Principles of Microeconomics**
	BCMB(BIOL)(CHEM) 3100 – Introductory Biochemistry and Molecular Biology <u>or</u> CHEM 2211/2211L – Modern Organic Chemistry II and Lab <u>or</u> MATH 2260 –Calculus II for Science and Engineering	**COMM 1100 – Introduction to Public Speaking**
		ANTH 1102 – Introduction to Anthropology <u>or</u> GEOG 1103 – Cultural Geography of the United States

Major Courses		
	STAT 2000 – Introductory Statistics	STAT 2000 – Introductory Statistics
	ECOL 3400 – Professional Development for Careers in Ecology	ECOL 3400 – Professional Development for Careers in Ecology
	ECOL(BIOL) 3500-3500L – Ecology	ECOL(BIOL) 3500-3500L – Ecology
		ECOL 3530 – Conservation Biology (Currently a major elective option for Ecology (BS) majors)
	ECOL 4950 – Senior Seminar	ECOL 4950 – Senior Seminar
	ECOL 4000/6000 Population and Community Ecology or ECOL(BIOL) 4150/6150-4150L/6150L – Population Biology of Infectious Diseases	**ECOL 3XXX Applied Ecology Field Program**
	ECOL 4010/6010 – Ecosystem Ecology or ECOL(FISH)(WASR) 4310/6310-4310L/6310L – Freshwater Ecosystems	**ECOL 4XXX- Environmental Practicum**
	ECOL 4240-4240L – Physiological Ecology or ECOL 4540/6540 – Behavioral Ecology	
	ECOL 4500/6500 – Evolutionary Ecology or GENE 3000 – Evolutionary Biology or GENE 3200 – Genetics	
Major Electives		
	Natural History Course	Natural History Course
	Methods/Skills Course	Methods/Skills Course
	Additional Major Electives (13-18 hours)	Additional Major electives (9-12 hours)
General Electives	(9-18 hours)	(20-23 hours)
Odum School Requirements		
	Foreign Language; Proficiency through the third semester	Foreign Language; Proficiency through the third semester
	Fine Arts/ Philosophy/ Religion/ Literature requirement	Fine Arts/ Philosophy/ Religion/ Literature requirement
	Social Sciences requirement	Social Sciences requirement

Ecology Major Requirements for Bachelor of Arts Degree

Required courses (20 hours)
STAT 2000 Intro to Statistics
ECOL 3400 Professional Development for Ecological Careers
ECOL 3500-3500L Ecology
ECOL 3530 Conservation Biology
ECOL 3XXX Applied Ecology Field Program
ECOL 4XXX Environmental Practicum
ECOL 4950 Senior Seminar

Organismal/ Natural History Requirement (4 hours)

Choose 1 from the following list:

ECOL 4050/6050-4050L/6050L Ichthyology
ECOL 4070/6070-4070L/6070L Invertebrate Zoology
ENTO 3140-3140L Insect Natural History
ENTO 4000/6000-4000L/6000L General Entomology
PATH(PBIO) 4200/6200-4200L/6200L Mycology
PBIO 4650/6650-4650L/6650L Plant Taxonomy
WILD(ECOL) 3580, WILD(ECOL) 3580L Vertebrate Natural History
WILD(ECOL) 4040/6040-4040L/6040L Herpetology
WILD(BIOL) 4050/6050, WILD(BIOL) 4050L/6050L Mammalogy
WILD(ECOL) 4060/6060-4060L/6060L Ornithology

Methods or Skills Requirement (3-4 hours)

Choose 1 from the following list:

CRSS(FANR) 3060, CRSS(FANR) 3060L Soils and Hydrology and Laboratory
ECOL(BIOL) 3510 Ecology Laboratory
ECOL 4940** Internship in Ecology
ECOL 4960 or ECOL 4960H** Research
ECOL(MARS) 4225-4225L Methods in Marine Ecology
ECOL(FISH)(WASR) 4310/6310-4310L/6310L Freshwater Ecosystems
FANR 3800, FANR 3800L Spatial Analysis of Natural Resources and Laboratory
GEOG 4370/6370-4370L/6370L Geographic Information Science
STAT 4210 Statistical Methods

Major Electives (9-12 hours)

Choose one 3-4 hour course from the following list:

ECOL 3000-3000L Introduction to Field Methods
ECOL 3100-3100L Tropical Field Ecology
ECOL 3220 Biology and Conservation of Marine Mammals
ECOL 3480 Special Topics in Ecology
ECOL(BIOL) 3510 Ecology Laboratory
ECOL 3520 Ecological Applications
ECOL 3880H Ecosystems of the World (Honors)
ECOL 3900* or ECOL 3900H* Directed Reading
ECOL 4050/6050-4050L/6050L Ichthyology
ECOL 4070/6070-4070L/6070L Invertebrate Zoology
ECOL 4130L Ecological Methodology
ECOL(BIOL) 4150/6150-4150L/6150L Population Biology of Infectious Disease
ECOL 4160 Ecology of North America
ECOL(MARS) 4225-4225L Methods in Marine Ecology
ECOL 4240-4240L Physiological Ecology
ECOL(FISH)(WASR) 4310/6310-4310L/6310L Freshwater Ecosystems
ECOL(BIOL)(MARS) 4330/6330-4330L/6330L Tropical Marine Invertebrates

ECOL 4500/6500 Evolutionary Ecology
ECOL(PBIO) 4520/6520 Plant-Animal Interactions
ECOL 4540/6540 Behavioral Ecology
ECOL 4940 ** Internship
ECOL 4960** or ECOL 4960H** Research
ECOL 4990** or ECOL 4990H** Senior Thesis

* Maximum of 3 credit hours of ECOL 3900 or ECOL 3900H may count towards Major Requirements.
** Maximum of 7 credit hours of ECOL 4940, (ECOL 4960 or ECOL 4960H), (ECOL 4990 or ECOL 4990H) in any combination may count towards Major Requirements.

Choose two 3 or 4 hour courses from the following list*:

*Please note that this list of potential electives is quite diverse. This will accommodate the range of interests that we expect to see among students seeking the A.B. degree in Ecology.

AAEC(ENVM) 3020 Analysis of Agribusiness and Natural Resources Issues
AAEC 3400 Introduction to Agricultural Policy
ALDR(AFST)(LACS) 4710/6710 International Agricultural Development
ANTH 3040 or ANTH 3045L Introduction to Biological Anthropology
ANTH 3090 Evolution of Human Ecosystems
ANTH 3100 Peoples of the World
ANTH 3200 How the World Works: Anthropology of Consumption & Globalization
ANTH 3235 Anthropology of Roots and Rooting
ANTH 3265 Introduction to Cultural Anthropology
ANTH 3541 Anthropology of Eating
ANTH 4010/6010 Historical Ecology
ANTH 4015/6015 Landscapes and Memories
ANTH 4070/6070 Cultural Ecology
ANTH 4100/6100 Evolution and Human Behavior
ANTH(BIOL)(ECOL)(EETH)(ENTO)(FANR)(GEOL)(PATH)(PBIO) 4261 Museum of Natural History Internship
ANTH(ECOL) 4290/6290 Environmental Archaeology
ANTH(PBIO) 4300/6300-4300L/6300L Ethnobotany
CMLT 3210 Ecocriticism
COMM 3200 Business and Professional Communication
COMM 3320 Environmental Communication
COMM 3600 Small Group Communication
CRSS(FANR) 3060, CRSS(FANR) 3060L Soils and Hydrology
CRSS 3540 Soil Morphology and Interpretation
CRSS 4010/6010 Principles of Sustainable Management
CRSS(HORT)(ANTH)(ECOL)(GEOG) 4930/6930 Agroecology of Tropical America
CRSS(HORT)(ANTH)(ECOL)(GEOG) 4931/6931 Agroecology of Tropical America Field Trip
EETH 4020/6020 Readings in Environmental Ethics
EETH(AESC) 4190/6190 Agricultural Ethics
EETH 4230/6230 Environmental Values and Policy
EHSC 4400/6400 Environmental Issues in the Developing World
EHSC 4610/6610 Water Pollution and Human Health
EHSC 4700/6700 Genetic Applications in Environmental Health Science
EHSC 4900 Global Environmental and Public Health
ENGL 4835 Environmental Literature
ENVM 3060 Principles of Resource Economics
ENVM(EHSC) 4250/6250 Environmental and Public Health Law
ENVM(ECOL)(FANR)(EHSC) 4770H Business of Environmental Law (Honors)
ENVM(AAEC) 4930/6930 Environmental Law and Governmental Regulation
FANR 3800, FANR 3800L Spatial Analysis of Natural Resources and Laboratory
FANR(ECOL) 4810/6810 Natural Resources Law
FISH(ECOL)(MARS)(WILD) 4550/6550-4550L/6550L Conservation Aquaculture
GENE 3000 Evolutionary Biology
GEOG 3110 Climatology

GEOG 3630 Introduction to Urban Geography
GEOG 4160/6160 Applied Climatology in the Urban Environment
GEOG(PBIO) 4220/6220 Ecological Biogeography
GEOG(PBIO) 4240/6240 Plant Geography
GEOG 4350/6350-4350L/6350L Remote Sensing of the Environment
GEOG 4370/6370-4370L/6370L Geographic Information Science
GEOG 4810/6810 Conservation Ecology and Resource Management
GEOL 3150 Coastal Processes and Conservation
GEOL 4010-4010L Life and Ecologies of the Past
GEOL 4520/6520 Paleoecology
HORT(CRSS)(ENTO)(PATH) 3125 Organic Agricultural Systems
HORT(CRSS)(ENTO)(PATH) 3126 Fertility and Pest Management in Organic Agriculture
HORT(ANTH)(PBIO) 3440 Herbs, Spices, and Medicinal Plants
IDIS(CBIO) 3100 People, Parasites, and Plagues
INTL 3200 International Relations
INTL 4210 International Law
INTL 4220 International Conflict
MARS 3450, MARS 3450L Marine Biology and Laboratory
MARS(MIBO) 4620/6620-4620L/6620L Microbial Ecology
MARS 4810/6810 Global Biogeochemical Cycles
PATH(ANTH)(PBIO) 3010 Fungi: Friends, and Foes
PBIO 3650-3650L Plant Ecology
PHIL(EETH) 4220/6220 Environmental Ethics
STAT 4210 Statistical Methods
STAT 4220 Applied Experimental Methods
STAT 4240/6240 Sampling and Survey Methods
WASR 4400-4400L Introduction to Wetlands
WASR(CRSS)(ECOL)(ENGR)(GEOG)(GEOL) 4700L/6700L Hydrology, Geology, and Soils of Georgia
WILD(ECOL) 4575/6575-4575L/6575L Conservation Medicine