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Proposal to Senate Committee on Educational Policy

Request for a Program in Ecology, Evolution and Conservation Biology

College of Liberal Arts and Sciences and
College of Agricultural, Consumer and Environmental Sciences

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DESCRIPTION:

To provide a disciplinary home for graduate training in ecology, evolution and conservation biology and to further elevate our national stature in this fields, we propose to convert the Program in Ecology and Evolutionary Biology (PEEB, currently a concentration in the biology degree) into a new interdepartmental (and multi-college) degree-granting Program in Ecology, Evolution and Conservation Biology (PEEC). The objective of the proposed program is to provide graduate students with advanced conceptual, technical and practical knowledge in the areas of ecology, evolution and conservation biology, and to prepare them for careers in academia, government and private sectors. In addition to developing a high degree of proficiency in modern analytical and quantitative methods, students will become thoroughly conversant with modes of inquiry and content of these disciplines. Recognizing the interdisciplinary nature of many issues in ecology, evolution and conservation biology, graduate training will be flexible and designed to promote broad interdisciplinary interaction.

As stipulated in the current graduate regulations for the M.S. or Ph.D. degree option of PEEB (see attached), the academic progress of students in the proposed program will be evaluated by two to four criteria, for the M.S. and Ph.D., respectively: (1) evaluation of course work; (2) an oral preliminary examination for doctoral students; (3) a thesis defense, including a public lecture for doctoral students and some masters students; and (4) ongoing evaluation of research progress.

Students in the program (M.S. and Ph.D.) will be required to take at least one course for graduate credit from an approved list of choices in each of three core course areas: ecology, evolution and conservation biology. Other course requirements are an orientation seminar (IB 546 Section A) to be taken by new students in their first semester of residence and a weekly graduate seminar on current topics in ecology, evolution and conservation biology (IB 546 Section B) for all students. To accommodate diverse student backgrounds and the breadth of disciplines in the program, an individual program of study will be designed for each incoming student. For example, a student interested in molecular evolution would receive training in molecular laboratory techniques, evolutionary theory and quantitative analyses. Alternatively, a person interested in field ecology would receive training in population and community ecology and statistics.

An Entrance Committee, in consultation with the student and the thesis advisor, will suggest courses appropriate to the student's goals after considering prior courses, experience and prospective areas of research. The student will choose an appropriate advisor and course of study upon entering the program.

JUSTIFICATION:

In anticipation of the campus-wide program, a graduate option known as the Program Ecology and Evolutionary Biology[1] (PEEB) was created as part of the biology degree in 1999 in the School of Integrative Biology (SIB) and the College of Liberal Arts and Sciences (LAS). Prior to this, a graduate advising option in Natural Resource Ecology and Conservation Biology (NRECB) was established and sponsored in the College of Agricultural, Consumer and Environmental Sciences (ACES) and its Department of Natural Resources and Environmental Sciences (NRES). In 2000, agreement was reached to merge NRECB and its resources into PEEB with the intention of broadening the scope of the program and, eventually, seeking the establishment of M.S. and Ph.D. degrees in ecology, evolution and conservation biology. To date, PEEB has enjoyed broad support and success and has drawn nearly 60 faculty from across campus together to share in the recruitment and training of graduate students. In its first 5 years, PEEB has recruited over 40 students of outstanding quality into the program.

Increased awareness of the significance of environmental issues continues to strengthen the demand in both public and private sectors for students with advanced degrees in ecology, evolution and conservation biology. The University of Illinois at Urbana-Champaign (UIUC) has a long tradition of excellence in graduate training in ecology and related fields, and many of the major contributors to ecological research during the twentieth century have served on the faculty or received graduate degrees in departments of the School of Integrative Biology (SIB), the College of Agriculture and Consumer Sciences (ACES), or their ancestral units.

Currently, graduate training in ecology, evolution and conservation biology is provided as a concentration within the biology degree and within other degree programs across campus. To take maximum advantage of the breadth of faculty expertise and student interest, and recognizing that there is a seamless progression from ecology and evolution to contemporary issues in conservation biology, we propose a new degree-granting program that integrates graduate education in these disciplines. The proposed program will provide a visible interdisciplinary and conceptual home for graduate training in fields where expertise is otherwise dispersed across campus. By means of a weekly seminar series, workshops, annual student symposia and faculty meetings, a diverse and interdisciplinary faculty will be integrated with the common objective of training graduate students in applied and basic aspects of ecology, evolution and conservation biology.

UIUC has a rich tradition of research and education in ecology, evolution and conservation biology. Faculty representing these areas reside in a number of units across campus. For example, the participating units in PEEB, as of this writing, include 12 departments in five colleges and one state agency (Table 1) (also see list of individual faculty). Faculty may join the Program by making application to the Director, presenting a research seminar, and receiving the approval of the Program Steering Committee.

[1] http://www.life.uiuc.edu/programs/PEEB/

Table 1. Current Participating Units in PEEB:

Department / Agency	College / Agency
Anthropology	Liberal Arts and Sciences
Animal Biology	Liberal Arts and Sciences
Atmospheric Sciences	Liberal Arts and Sciences
Civil and Environmental Engineering.	Engineering
Crop Sciences	Agricultural, Consumer and Environmental Sciences
Entomology	Liberal Arts and Sciences
Geography	Liberal Arts and Sciences
Illinois Natural History Survey	Illinois Department of Natural Resources
Natural Resources and Env. Sciences	Agricultural, Consumer and Environmental Sciences
Plant Biology	Liberal Arts and Sciences
Urban and Regional Planning	Fine and Applied Arts
Veterinary Biosciences	Veterinary Medicine
Veterinary Pathobiology	Veterinary Medicine

To bring focus and build capacity to our graduate training by integrating across traditional campus boundaries, we propose a new interdepartmental program that will attract greater participation from diverse campus units. This degree-granting program will be jointly governed by an elected program Director and a Steering Committee chosen by the program faculty. The everyday activities and financial accounting of the program will be administered by the School of Integrative Biology (SIB); support and faculty involvement will come from units across campus. The services offered by SIB reflect the administrative origin of the program. Governance will be a function of the Steering Committee, a body with membership from units across campus.

UIUC has substantial national prominence in ecology—the National Research Council (NRC) ranked it among the top graduate programs in its last survey. The establishment of a cohesive and highly visible program that draws together prominent scientists will nurture the growth of ecology, evolution and conservation biology, draw national attention to UIUC and place a top-ten NRC ranking firmly within reach.

BUDGETARY AND STAFF IMPLICATIONS:

Additional Staff and Dollars Needed: The resources required for the proposed program are largely extant in support of the established Program in Ecology and Evolutionary Biology (Table 2); therefore, the budget and staff implications are modest. As a campus-wide program that draws faculty affiliation from diverse units, the Program does not anticipate attached faculty lines. The resources for a half-time administrative assistant will continue to be provided by the School of Integrative Biology. Resources for Teaching Assistants and Research Assistants and the operating budget have been secured on a recurring basis from participating units. No new staff needs are anticipated. Participating faculty are recruited from departments throughout campus. These faculty populate the various committees needed for the program functions.

Table 2. Proposed PEEC budget.

Budget item	Amount ($)	Source
RA support	48,000 [1]	ACES
TA support	160,000 [1]	SIB
Seminar	8,800 [1]	Environmental Council (EC) and participating units
Recruiting, student symposium and workshop	6,000 [1]	EC and participating units
Graduate research/travel grants & fellowships	45,000 [1]	EC and participating units
Office	1,500 [1]	EC and participating units
Secretary	20,000 [1]	SIB
Director salary (summer)	8,000 [1]	LAS
Total	297,300	
Present support	297,300	
Total new recurring funds requested	0	

[1]Resources already secured by the program on a recurring basis, see Table 3

Table 3. Breakdown by unit of commitments to Program.

Participating Unit	Annual Amount ($)
College of Liberal Arts and Sciences	38,000
College of Agricultural, Consumer and Environmental Sciences (through FY09)	48,000 to 51,000
School of Integrative Biology (teaching assistantships, secretary and office support)	181,500
The Environmental Council	18,000
Departments:	
Animal Biology	2,000
Anthropology	800
Entomology	2,000
Natural Resources and Environmental Sciences	5,000
Plant Biology	2,000

Internal Reallocations: None anticipated.

Effects on Course Enrollments in Other Units: Other than the aforementioned seminar courses, the Program will have no set course requirements beyond what is recommended by the Program's Entrance Committee. To date, students have taken courses offered by SIB, ACES (especially Animal Sciences, Crop Sciences and NRES), College of Veterinary Medicine, and several departments within LAS. Therefore, the students

recruited into the program have enhanced enrollments in several courses that offer graduate credit.

Impact on library, computer use, laboratory use, and equipment: The impact on library resources will be minimal as the Program anticipates a cap of approximately 60 students. Moreover, the periodicals and other information resources that will be used by students in the program are already available. No dedicated computer labs or associated resources are requested. No dedicated space, facilities, or equipment are requested.

Guidelines for Undergraduate Education: NA

Clearances: See attached documents.

Effective Date:

Statements for Programs of Study Catalog

Program in Ecology, Evolution and Conservation Biology

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GRADUATE DEGREE PROGRAMS

The Program in Ecology, Evolution and Conservation Biology (PEEC) is an interdepartmental program designed to provide individualized training in preparation for careers in these disciplines. All students are required to take at least one course for graduate credit from an approved list of choices in each of three core course areas: ecology, evolution and conservation biology. Because of the breadth of fields covered by this program, there are no other fixed course requirements other than attendance at the program's seminar series. Courses taken by a student come from multiple departments. The goal of the program's regulations is to allow maximum flexibility while providing close supervision, with the outcome of producing scientists who are broadly educated and technically competent in ecology, evolution and conservation biology and associated disciplines. The program offers M.S. and Ph.D. degrees.

ADMISSION

Prospective candidates must meet the requirements for admission set by the Graduate College of the University of Illinois at Urbana-Champaign. Only applicants who have graduated from an accredited college or university and who hold or will be granted a baccalaureate degree (or its equivalent) comparable in content and completed credit hours to that granted by the University of Illinois will be considered. Applicants must have a minimum grade-point average of 3.0 (A = 4.0) computed from the last 60 hours of undergraduate (and any graduate) work completed. The program will give preference to candidates who hold a degree in biology or a closely related discipline and show promise of excellence in research and teaching. Typically, only students with strong letters of recommendation, high scores on the Graduate Record Examinations, and a GPA well above the minimum stated above will be admitted, although demonstration of academic excellence by other means (e.g., extensive field or laboratory research experience) will be considered. The Graduate Committee will make decisions concerning admission. For students whose native language is not English, the Program requires a minimum paper-based TOEFL score of 600 (250 on the computer-based test).

GRADUATE TEACHING EXPERIENCE

Students working towards the Ph.D. degree must complete at least two semesters of favorably evaluated teaching before receiving their degree. Students may petition to have this requirement waived.

SELECTION OF COURSE OF STUDY

Before their first semester in the Program each student will be assigned a major advisor, and the student and advisor will meet with an Entrance Committee to identify an appropriate course of study. Typically, the advisor will have been selected by the student before admission to the Program, but this can be changed with approval by the Program Director. The Entrance Committee will be appointed by the chairperson of the Graduate Committee. In consultation with their advisor and the committee, the student will select three areas of training emphasis: (1) the general area of ecology, evolution or conservation biology; (2) a complementary general area (such as behavior, systematics, physiology, genetics); and (3) a specific area related to their research (such as speciation, sexual selection, bioenergetics, population dynamics, or organismal biology of primary interest). The student's advisory committee (formed during the student's first year in residence) can modify the recommendations of the Entrance Committee. All students will be required to take at least one course for graduate credit from an approved list of choices in each of three core course areas: ecology, evolution and conservation biology. Beyond these requirements, the particular courses recommended by the Entrance Committee will depend on the individual student's previous training, experience and knowledge of the subject matter. All students will be required to develop strong quantitative skills, which may require advanced course work in statistics or other analytical methods.

MASTER OF SCIENCE DEGREE REQUIREMENTS

By the end of the second year, students must complete 32 hours of acceptable graduate course work in their three core areas and maintain at least a 3.0 GPA. At least 12 hours must be at the 500-level. In addition to the requirement of three core courses, all students must register for and attend the weekly PEEC seminar series (IB 546). Excuses because of conflicts must be approved by the Director of the Program. Graduation requires the completion of a thesis that is successfully defended. Student research will be guided and approved by an Advisory Committee of three faculty from at least two departments, including the Major Advisor who will serve as chair. The Director of the Program must approve membership of the Advisory Committee.

DOCTOR OF PHILOSOPHY

Before receiving their degree, students must complete at least 96 hours of 400- or 500-level courses (64 hours in addition to the M.S. requirements) and maintain at least a 3.0 GPA. Students may be admitted into the program without having first earned a Master of Science degree. In addition to the requirement of three core courses, all students must register for and attend the weekly PEEC seminar series (IB 546). The Director of the

Program must approve excuses because of conflicts. Those students entering the program with a M.S. degree may petition the Entrance Committee to consider completed graduate course work as fulfillment of one or more core course requirements.

All students must complete at least two semesters of favorably evaluated teaching before receiving their degree (or petition to have the requirement waived). No later than their second semester in the program, the student in consultation with their Major Advisor will select members of the student's Advisory Committee, which will meet annually with the student to plan course work and research and to review and facilitate progress toward the degree. Students will prepare a short written report of their activities during the previous year for consideration by the Advisory Committee. The Advisory Committee will thoroughly consider all aspects of the student's activities, after which the Major Advisor will provide a written report of progress to the program's Graduate Committee.

The faculty constituting a student's Advisory Committee must come from two or more departments, comprise a minimum of four members (including the Major Advisor), be familiar with the student's area of research interest, and be approved by the Director of the Program. The chair of the Advisory Committee is typically the Major Advisor, provided that this person is both a member of the University's Graduate Faculty and the Program in Ecology, Evolution and Conservation Biology. If this is not the case, the Director of the Program will appoint a chairperson who fulfills these requirements from among the committee membership. The Advisory Committee will be responsible for administering the necessary examinations. No later than their sixth semester in the program, and preferably in their fifth semester, doctoral students must take a Preliminary Examination. For this exam, a member of the Advisory Committee other than the Major Advisor will be appointed chair by the Director of the Program. The first part of the three-hour oral exam will be general and cover the student's three areas of training emphasis. The second part of the exam will be a defense of the research proposal. Two weeks prior to the exam, the student must present to the Advisory Committee a proposal prepared in the format of a proposal for an NSF Dissertation Improvement Grant. It should describe the objectives of the research project, the experimental plan and rationale, the results of pilot studies, a budget and a tentative timetable for its completion. The student will present evidence of feasibility and significance of the proposal, but the main research for the dissertation shall not have been performed prior to the Preliminary Examination. A detailed report of the exam and a copy of the research proposal shall be submitted to the Graduate Committee. A passing grade qualifies the student as a Ph.D. candidate. A failing grade will require the student to take a second preliminary examination no later than the following semester. A second failure will result in dismissal from the program.

Upon completion of a dissertation and the other requirements of the program, the student will complete a Final Examination, which shall consist of a defense of the dissertation. Copies of the completed dissertation, approved by the Major Advisor, should be submitted to the Advisory Committee at least two weeks prior to the Final Examination. The thesis will be judged in relation to published scholarly work in the field, and students will be encouraged to begin publishing their results before taking their Final

Examination. Passing this exam and presentation of the dissertation by the student at a public seminar sponsored by the program qualifies the student for the Ph.D. degree. Failure will require the student to conduct additional research and to repeat the Final Examination.

FINANCIAL AID

Students admitted to the Program are typically offered two years of support for the M.S. degree and five years of support for the Ph.D. degree. Support consists of fellowships, teaching assistantships or research assistantships. Such support typically comes with a waiver of tuition, service fees, or both. Continued offers of assistantships or fellowships each academic year will depend on an evaluation of satisfactory progress by the Director and the program's Graduate Committee. Students who require more than two years to complete the M.S. degree or five years to complete the Ph.D. degree must submit a written petition to the program's Graduate Committee, supported by their advisor, to be considered for an additional year of support.

* Available for review in the Senate Office.