MEMORANDUM

TO: Cheng-i Wei
Dean, College of Agriculture and Natural Resources

FROM: Elizabeth Beise
Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Curriculum of the Ph.D. in Environmental Science and Technology (PCC log no. 12012)

At its meeting on October 5, 2012, the Senate Committee on Programs, Curricula and Courses approved your proposal to modify the curriculum of the Ph.D. in Environmental Science and Technology. A copy of the approved proposal is attached.

The change is effective Spring 2013. Please ensure that the change is fully described in the Graduate Catalog and in all relevant descriptive materials, and that all advisors are informed.

MDC/
Enclosure

cc: William Idsardi, Chair, Senate PCC Committee
Sarah Bauder, Office of Student Financial Aid
Reka Montfort, University Senate
Erin Howard, Division of Information Technology
Donna Williams, Institutional Research, Planning & Assessment
Anne Turkos, University Archives
Linda Yokoi, Office of the Registrar
Mark Shayman, Graduate School
Leon Slaughter, College of Agriculture and Natural Resources
William Bowerman, Environmental, Science & Technology
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/CURRICULUM/UNIT PROPOSAL

Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.

Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

College/School:
Please also add College/School Unit Code-First 8 digits: 01202500
Unit Codes can be found at: https://hypprod.umd.edu/Html_Reports/units.htm

Department/Program:
Please also add Department/Program Unit Code-Last 7 digits: 1250901

Type of Action (choose one):

- X Curriculum change (including informal specializations)
- New academic degree/award program
- Renaming of program or formal Area of Concentration
- New Professional Studies award iteration
- Addition/deletion of formal Area of Concentration
- New Minor
- Suspend/delete program
- Other

Italics indicate that the proposed program action must be presented to the full University Senate for consideration.

Summary of Proposed Action: ENST proposes to add a fourth graduate specialization for their Ph.D. (and M.S.; see accompanying proposal) degrees: Ecosystem Health and Natural Resource Management. The specialization in Ecosystem Health and Natural Resource Management is intended to address the keen awareness among Environmental Science and Human Health communities concerning the increasing need to: 1) understand environmental factors and ecosystem functions that affect ecological communities; 2) understand effects of human activities on natural resources and the services we depend on; and 3) develop effective policy and management tools that utilize knowledge on the environment and society to promote sustainable growth and development. Almost all of the courses within this specialization are currently taught by ENST faculty or are under existing programs (BEES, CONS, MEES). This new specialization requires no new facilities and will use the existing ENST graduate program learning outcomes and assessments.

APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair
   
2. Department Chair
   
3. College/School PCC Chair
   
4. Dean
   
5. Dean of the Graduate School (if required)
   
6. Chair, Senate PCC
   
7. University Senate Chair (if required)
   
8. Senior Vice President and Provost
PROPOSAL FOR
ADDITION OF INFORMAL AREA OF SPECIALIZATION

SPECIALIZATION IN ECOSYSTEM HEALTH AND NATURAL RESOURCE MANAGEMENT IN
Ph.D. GRADUATE PROGRAM OF
ENVIRONMENTAL SCIENCE AND TECHNOLOGY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES
DEAN: CHENG-I WEI

PROPOSED INITIATION DATE: FALL 2012
1. SUMMARY/RATIONALE

The Department of Environmental Science and Technology (ENST) was formed July, 2006, bringing together faculty from two departments in the College of Agriculture and Natural Resources: the soil science faculty from the former Department of Natural Resource Sciences and Landscape Architecture (NRSL), and most of the faculty from the former Department of Biological Resources Engineering (BRE). Since Fall 2008, ENST has offered a graduate program leading to the Master of Sciences and Doctor of Philosophy degrees in which students work within one of three specializations: 1) Soil and Watershed Sciences; 2) Ecological Technology Design; or 3) Wetland Science, and an undergraduate program leading to the Bachelor of Science degree in which students work within four specializations: 1) Soil and Watershed Sciences; 2) Ecological Technology Design; 3) Natural Resources Management; or 4) Environmental Health. ENST proposes to add a fourth specialization for their M.S. and Ph.D. (see accompanying proposal) degrees: Ecosystem Health and Natural Resource Management.

The specialization in Ecosystem Health and Natural Resource Management is intended to address the keen awareness among Environmental Science and Human Health communities concerning the increasing need to: 1) understand environmental factors and ecosystem functions that affect ecological communities; 2) understand effects of human activities on natural resources and the services we depend on; and 3) develop effective policy and management tools that utilize knowledge on the environment and society to promote sustainable growth and development. The creation of this specialization will place the University of Maryland among the vanguard of public universities in offering a program that examines the complex interactions between ecosystem functioning, ecological health, and sustainability from a primarily ecological context. Programs similar to this exist at University of Wisconsin Madison and Arizona State University. Specific regional programs that focus on the Natural Resource Management aspects not in concert with Ecosystem Health and that are competitors for our potential graduate students are found at North Carolina State University, Virginia Tech University, West Virginia University, and The Penn State University.

The proposed specialization fulfills a logical graduate option for students working within both our Environmental Health and Natural Resources Management undergraduate specializations. The number of students in these two undergraduate specializations total 59 in Fall 2011, exceeding initial projections in ENST’s strategic plan by 169%. Further, Environmental Science and Policy’s Wildlife Ecology and Management program, administered through ENST, has a current enrollment of 65 undergraduates making the combined EHNRM and ENSP undergraduate enrollment at 124 students. More generally, this specialization fulfills a growing need to fuse systems ecology, resource management, and human health. Following the philosophy that underpinned the establishment of the ENST, we acknowledge that numerous departments and units on the campus and in the system are engaged in various aspects of Ecosystem Study and Resource Management. Our proposed new specialization will complement, and thus strengthen, existing efforts in ecosystem studies and resource management. We will be intentional in our collaboration, cooperation and support of these programs.

2. SPECIFIC CHANGES (as shown in relevant paragraphs in the graduate catalog)

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<tr>
<th>Current Ph.D. requirements</th>
<th>Proposed Ph.D. requirements (new specialization additions in bold)</th>
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<tr>
<td>ENST Departmental Core Requirements: All ENST Ph.D. students are expected to complete a minimum of 50 credits beyond the B.S. degree (in addition to research credits 898 and 899) and are</td>
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required to complete ENST 602, 702 and two graduate level statistics courses (these can be taken during either the M.S. or Ph.D. program), and two semesters of Graduate Seminar (ENST 798).

Specialization Requirements: ENST Ph.D. students are expected to have completed all of the M.S. requirements for the particular specialization chosen. In addition to having met the M.S. requirements, the Soil and Watershed Sciences specialization requires that Ph.D. students complete one semester of graduate level physical chemistry or biochemistry and one additional graduate level course in chemistry, biochemistry, physics, mathematics, engineering, or computer science; the Ecological Technology Design specialization requires that Ph.D. students complete one semester of graduate level systems modeling, and one additional graduate level course in ecology, ecological design or ecological engineering; the Wetland Science specialization requires that Ph.D. students complete one semester of graduate level systems modeling, and two additional graduate level courses from within the areas of Ecology, Soil Science, or Hydrology.

Almost all of the courses within this specialization are currently taught by ENST faculty or are under existing programs (BEES, CONS, MEES). However, we do propose the creation of 1 new course that all students will be required to take:

ENST 604 ADVANCED ECOSYSTEM HEALTH AND NATURAL RESOURCE MANAGEMENT (3 credits): Fundamental research principles, strategies and methods of investigation in Ecosystem Health and Natural Resource Management to include field, laboratory and computational methods.

3. IMPACTS

Impacts on Resources

- The current ENST graduate program has a total of 40 graduate students with about 35% of these being Ph.D. students. With the addition of the proposed new specialization, over the next five years we expect this total number to increase by 25% resulting in a total graduate enrollment of approximately 50 graduate students with approximately 50% of these being Ph.D. students. New courses will be mainly supported by existing faculty. Since 2008, ENST has added 5 new tenure
and tenure-track faculty (1 Full Professors, 1 Principal Agent, 3 Assistant Professors); and added 2 Research Scientists and 2 Adjunct Faculty. In addition, one new tenure-track faculty line is currently being advertised.

- The new specialization requires no new facilities.
- The new specialization will use the existing ENST graduate program learning outcomes and assessments.

Related Programs

- With the expected increase in graduate students, and the numbers of suggested courses, we expect only 2-3 additional students wanting to take any particular existing course at any given time, and thus minimal impacts on existing programs.

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1 ENST Master of Science (M.S.) Core Requirements: All ENST M.S. students are required to complete ENST 602 and 702, two semesters of Graduate Seminar (ENST 798), and one graduate level statistics course. Specialization Requirements: The Soil and Watershed Sciences specialization requires that M.S. students complete a total of twelve credits of graduate level soil science courses among any four of the following five areas: soil chemistry, soil physics, pedology, soil biology, soil fertility. The Ecological Technology Design specialization requires that M.S. students complete a total of twelve credits of graduate level courses that have been approved by the student's advisory committee. Six credits must be in ecology and six credits must be in ecological design or related engineering courses. The Wetland Science specialization requires that M.S. students complete a total of twelve credits from a list of approved graduate level courses. A minimum of three credits must be earned from each of these groups: Ecology, Soil Science, Hydrology.

2 The Soil and Watershed Sciences specialization requires that M.S. students complete a total of twelve credits of graduate level soil science courses among any four of the following five areas: soil chemistry, soil physics, pedology, soil biology, soil fertility. The Ecological Technology Design specialization requires that M.S. students complete a total of twelve credits of graduate level courses that have been approved by the student's advisory committee. Six credits must be in ecology and six credits must be in ecological design or related engineering courses. The Wetland Science specialization requires that M.S. students complete a total of twelve credits from a list of approved graduate level courses. A minimum of three credits must be earned from each of these groups: Ecology, Soil Science, Hydrology. The Ecosystem Health and Natural Resource Management specialization requires that students complete a total of twelve credits from graduate level courses approved by their advisory committee. Students are required to take ENST604 (3 credits) and 9 additional credits in Ecosystem Health and Natural Resource Management.