

INDIANA UNIVERSITY

University Graduate School
2005-2006
Academic Bulletin

University Graduate School
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Environmental Programs

**School of Public and Environmental Affairs
Bloomington**

Departmental E-mail
spea@indiana.edu

Note: Be sure to specify which program you are interested in when sending mail.

Departmental URL
www.spea.indiana.edu

Graduate Faculty

Unless otherwise noted in parentheses, the faculty member's primary affiliation is with the School of Public and Environmental Affairs.

(An asterisk [*] denotes membership in the University Graduate School faculty with the endorsement to direct doctoral dissertations.)

Arthur E. Bentley Professors

Lynton Caldwell* (Emeritus), Elinor Ostrom* (Political Science)

Distinguished Professors

Gary Hieftje* (Chemistry), Ronald Hites* (Chemistry and Public and Environmental Affairs)

Professors

Randall Baker*, Simon Brassell* (Geological Sciences), Keith Clay* (Biology), Jeremy Dunning* (Geological Sciences), George Ewing* (Emeritus, Chemistry), Hendrik Haitjema*, Theodore Miller*, Emilio Moran* (Anthropology), Craig Nelson* (Biology), David Parkhurst*, Lisa Pratt* (Geological Sciences), J. C. Randolph*, Edwardo Rhodes*, Eugene Tempel* (Education), Donald Whitehead* (Emeritus, Biology), Jeffrey White*

Associate Professors

Debera Backhus*, Chris Craft, C. Susan B. Grimmond* (Geography), Diane Henshel*, Kerry Krutilla*, Vicki Meretsky, Flynn Picardal*, Sara Pryor* (Geography), Ingrid Ritchie (I), Scott Robeson* (Geography), Hans Peter Schmid* (Geography)

Assistant Professors

Matthew Auer, Philip Stevens

An (I) after a faculty member's name indicates that the person teaches at Indiana University-Purdue University Indianapolis

Academic Advisor

Professor Hendrik Haitjema*, SPEA 440, (812) 855-0563

Doctoral Student Advisor

Professor J. C. Randolph*, SPEA 447, (812) 855-4953

Program Information

The environmental programs described below are cooperative undertakings of the School of Public and Environmental Affairs (SPEA), the College of Arts and Sciences, and the University Graduate School. They are administered by SPEA or the University Graduate School or both and provide courses and degree programs for students, not only in SPEA, but across the university.

Degrees Offered

Dual master's degrees in environmental science (M.S.E.S.) and ecology/ evolutionary biology (M.A.), dual master's degrees in environmental science (M.S.E.S.) and geological sciences (M.S.), dual master's degrees in environmental science (M.S.E.S.) and geography (M.A.) (all three dual degrees are offered jointly with SPEA), and the Doctor of Philosophy in environmental science. In addition, SPEA offers the Master of Science in Environmental Science (M.S.E.S.), the Master of Public Affairs (M.P.A.) with a concentration in environmental policy and natural resources management, a combined M.S.E.S./M.P.A. degree, a combined M.S.E.S. and Doctor of Jurisprudence, and a combined M.P.A. and Doctor of Jurisprudence. The latter two combined degrees are offered jointly with the School of Law. For information regarding ecology and evolutionary biology, geography, and geological sciences, consult the respective department listings elsewhere in this bulletin; for information regarding the degrees offered exclusively or jointly by the School of Public and Environmental Affairs and the School of Law, see their respective bulletins or call (812) 855-2840.

Dual Master Degrees

The student must apply to and be accepted by both the School of Public and Environmental Affairs and either the program in ecology and evolutionary biology of the Department of Biology, the Department of Geography, or the Department of Geological Sciences. The student must select a supervisory committee of at least three faculty members, representing both the School of Public and Environmental Affairs and either ecology and evolutionary biology, geography, or geological sciences.

Requirements

A total of 60 credit hours that qualify the student for two master's degrees. For specific program requirements, see the departmental listings in this bulletin and the School of Public and Environmental Affairs Graduate Programs Bulletin..

Doctor of Philosophy Degree

The doctoral program is administered by the School of Public and Environmental Affairs in cooperation with the biology, chemistry, geography, and geological sciences departments. The Ph.D. in environmental science is awarded by the University Graduate School.

The program provides a rigorous, comprehensive education in environmental science. The specific objectives of the program are: (1) to conduct advanced research and scientific analysis of environmental events, issues, and problems; (2) to further understanding of the nature and management of natural and human environments; and (3) to provide an opportunity for students and faculty members in several departments to engage in collaborative environmental research in an interdisciplinary mode.

Admission

A student must apply to the School of Public and Environmental Affairs for doctoral studies; those accepted will be recommended to the University Graduate School for formal admission into the Ph.D. program. Applicants to this program must have completed at least a bachelor's degree in science, mathematics, engineering, or a closely related field. Prospective students are required to submit (1) a statement of purpose, which should be as specific as possible and, preferably, should refer to potential research mentors by name; (2) official results of the Graduate Record Examinations (GRE); (3) official transcripts of all undergraduate and graduate course work completed; and (4) three letters of recommendation. Applicants whose native language is not English must also submit results of the Test of English as a Foreign Language (TOEFL).

Degree Requirements

The degree requires: (1) substantial knowledge in a primary environmental science concentration; (2) breadth in related environmental science and policy; (3) an understanding of research methods; (4) an in-depth knowledge of the dissertation topic; and (5) a dissertation that demonstrates the student's ability to analyze, explain, and interpret research clearly and effectively.

Advisory Committee

During the first semester of enrollment, each student must organize an advisory committee. Normally this committee consists of at least four faculty members; at least two should be from the School of Public and Environmental Affairs; the others may be from other departments. Membership of the advisory committee is approved by the director of the Doctoral Program in Environmental Science and the dean of the University Graduate School. At least three members of the advisory committee must be members of the graduate faculty.

Fields of Study

Each student defines a principal field of study and describes it in a narrative statement. This statement should discuss the student's previous educational experiences, outline a program of course work that lies within the student's proposed field of study, and state the student's career objectives. The principal field may be interdisciplinary. The student should prepare a proposal outlining a program of course work that the student believes lies within that field.

Each student is also required to prepare a program of course work that fulfills the requirements for breadth in environmental science and policy. The breadth requirement may be fulfilled by using a wide spectrum of environmentally related courses, including areas such as economics, law, and management, in addition to other science courses.

Each student is also required to prepare a statement of activities for meeting the research methods requirement. Normally these include subjects such as computer science, geographic information systems, remote sensing, statistics, and mathematical modeling, although other technical skill areas such as electronics and analytical chemical techniques may be appropriate for some students.

The research undertaken by the student will be interdisciplinary. Because a knowledge of the basic sciences is necessary to understanding environmental problems, and the application of that knowledge is necessary for the development of solutions to those problems, the research may be primarily basic, primarily applied, or some mixture of both.

Course Requirements

The exact nature and amount of course work in each of the three areas—principal field of study, breadth in environmental science and policy, and research methods is determined by the advisory committee after review and approval of the student's plan of study in each of these areas. Selection of specific courses is based on obtaining (1) adequate knowledge for qualifying examinations, (2) appropriate preparation for a research project, and (3) a mixture of courses that meet the individual professional goals of the student.

The Ph.D. requires the completion of at least 90 credit hours in advanced study and research beyond the bachelor's degree. A student must complete a minimum of 30 credit hours of advanced course work in environmental science and policy. Students must also complete a minimum of 30 credit hours of research, normally taken as SPEA E625 or SPEA E890. The student, with approval of the advisory committee, should complete some combination of additional course work and research sufficient to meet the 90 credit hour requirement. Students are required to enroll in SPEA E680 Seminar in Environmental Science and Policy (1 credit hour/semester) for six semesters during the course of their degree program. Students enrolled in SPEA E680 may either make a formal presentation or write a brief synopsis and critique of four presentations attended during the semester. Six (6) credit hours of SPEA E680 may be used to fulfill a portion of the breadth requirement. Students are also required to enroll at least once in SPEA E710 Advanced Topics in Environmental Science during the course of their degree program. SPEA E710 may be taken multiple times, as the topics vary. Advanced topics courses may be used to meet requirements in either the principal field of study or breadth in environmental science and policy, depending upon the topic and the student's area of interest.

Students should note that all 30 credit hours of advanced course work, if properly selected, and 6 credit hours of research, may be applied toward the Master of Science in Environmental Science (M.S.E.S.) degree. With an additional 12 credit hours of approved course work, a student may be awarded the M.S.E.S. degree while completing the requirements for the Ph.D. degree in environmental science. Completion of the M.S.E.S. degree as part of this doctoral program is not a requirement; however, this option may be appropriate for some students.

Qualifying Examinations

Before a student is admitted to candidacy, all requirements determined by the advisory committee must be met and the qualifying examinations passed. A student who fails qualifying examinations may retake them only once.

The decision to admit a student to doctoral candidacy is made by the advisory committee, which evaluates the student's performance in the written examination, research proposal, and oral examination.

Written Examination

This examination should be taken by the end of the student's fifth semester in the Ph.D. program. The exam focuses on topics covered by the student's course work and related to the student's research interests. The examination is written and graded by the student's advisory committee. The written examination is graded as "pass," "conditional pass," or "fail."

Research Proposal

No later than the end of the fifth semester, the student should submit a written research proposal for review by the advisory committee. The proposal should be documented, clearly stating a research objective, the approach to be taken, and the significance of the work.

Oral Examination

Each candidate is examined orally by the advisory committee. The oral examination will be comprehensive in nature and covers the student's research proposal.

Research Committee

Upon the student's successful completion of the qualifying examination, a research committee will be formed. Normally this committee consists of at least four faculty members. At least two should be from the School of Public and Environmental Affairs; the others may be from other departments. The director of the Doctoral Program in Environmental Science recommends the student's research committee to the dean of the University Graduate School. At least three members of the research committee must be full members of the graduate faculty.

Dissertation

A dissertation is required and must be of sufficient value to warrant publication. The dissertation must represent a substantial research effort, both in quality and quantity. The dissertation requirement may be met by preparing a traditional dissertation or by preparing a portfolio of research documents including publications, manuscripts in press, and a completed manuscript suitable for submission to a journal. These documents may have multiple authors, although the doctoral candidate must demonstrate that he or she made significant contributions to at least two of the publications or manuscripts submitted for review. The research portfolio must have introductory and concluding chapters to integrate across the topics, and sufficient transitional material between documents to meet the University Graduate School's requirements for dissertations. A public presentation of the dissertation research is required. The dissertation must be approved by the research committee.

Ph.D. Minor in Environmental Studies

(12 credit hours)

Students in Ph.D. programs at Indiana University may, with the consent of their advisory committee, choose environmental studies as an outside minor. The minor is flexible and is usually designed by students in accordance with their needs.

Requirements

1. The doctoral candidate must secure a faculty advisor in consultation with the director of the Doctoral Program in Environmental Science. The advisor may not be from the candidate's major department. The candidate's advisor serves as the representative in all examinations or other requirements of the candidate's Ph.D. program that relate to the minor. The advisor decides on the character of the examination, if any, in the minor field and certifies that the candidate has met the requirements of the minor.
2. The candidate must take at least 12 credit hours of graduate-level courses related to environmental studies. These courses must be from at least two different disciplines outside the candidate's major department. The choice of courses should be made in consultation with the candidate's advisor and must be approved by the director of the Doctoral Program in Environmental Science. Acceptance of the proposed minor is based on two criteria: (1) the courses must have a direct relationship to environmental studies, and (2) the courses must not normally be required as part of major or tool-skill options in the student's major department. Courses in the minor program should be selected according to the student's interest. Students majoring in areas other than the natural sciences, for example, may wish to consider course offerings in the natural sciences; similarly, natural science students might consider course offerings in the social and behavioral sciences.
3. A minimum cumulative grade point average of 3.0 (B) must be attained in all courses used for the minor.

Courses

For descriptions of courses offered by the School of Public and Environmental Affairs, see the School of Public and Environmental Affairs Graduate Programs Bulletin.