New Course Request

Indiana University

South Bend Campus

Check Appropriate Boxes: Undergraduate credit □ Graduate credit ☐ Professional credit □

1. School/Division School of Education

2. Academic Subject Code ____________

3. Course Number E521 (must be cleared with University Enrollment Services)

4. Instructor C. Sprague

5. Course Title Topics in Environmental Science Education

Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Summer Session 1, 2007

7. Credit Hours: Fixed at 3, or Variable from _____ to _____

8. Is this course to be graded S-F (only)? Yes ____ No X

9. Is variable title approval being requested? Yes ____ No X

10. Course description (not to exceed 50 words) for Bulletin publication: Course goals: (1) help elementary teachers develop basic scientific literacy regarding environmental issues and principles, and (2) translate this basic literacy into elementary classrooms through hands-on activities. Course content: natural systems and cycles and how various kinds of pollution affect natural systems. Field trip required. For elementary majors only and for re-certification.

11. Lecture Contact Hours: Fixed at 3 or Variable from _____ to _____

12. Non-Lecture Contact Hours: Fixed at _____ or Variable from _____ to _____

13. Estimated enrollment: 20 of which 100 percent are expected to be graduate students.

14. Frequency of scheduling: 1 time/yr. Will this course be required for majors? No

15. Justification for new course: To promote an advanced level understanding of environmental science and methods of teaching environmental science. Yes

16. Are the necessary reading materials currently available in the appropriate library?

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be an overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

Amos W. Curo Date 11-15-06
Department Chairman/Division Director

Approved by:

Mark A. Brutten Date 12-5-06
Dean

Date

Chancellor/Vice-President

Date

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
SCHOOL OF EDUCATION
INDIANA UNIVERSITY SOUTH BEND

Course Title: Topics in Environmental Science
Course Number: E521
Section: 0100

School of Education Mission Statement:
Through our programs in the School of Education at Indiana University South Bend and our active engagement in the community, we prepare teachers and other school personnel to be competent, ethical, and reflective practitioners. Our candidates and faculty are professionals dedicated to continuous learning in order to address the needs of diverse individuals and prepare them for the complexities of a rapidly changing world. As part of a public comprehensive university and through our service to schools we strive to make a positive difference in the community within and beyond north central Indiana.

Instructor: Connie Sprague
Phone: 574-520-4129
Office: G201C
Office Hours: before and after class and by appointment
E-mail: csprague@iusb.edu

COURSE DESCRIPTION:
This course has two primary goals: (1) to help the elementary teacher develop a basic scientific literacy with respect to environmental issues, concepts and principles; and (2) to translate this basic literacy into the elementary classroom through hands-on activities. Course content includes such topics as natural systems and cycles and how various kinds of pollution affect these natural systems. Field trip required. For elementary majors only; outside of secondary education. S

COURSE TEXT: No textbook is required; handouts and other reading materials will be provided.
SPECIAL STATEMENTS:

IUSB Pedagogical Content Standards: Teachers of Early and Middle Childhood know, understand, and use the fundamental concepts in the subject matter of science including physical, life, and earth and space sciences as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry processes scientists use in discovery of new knowledge to build a base for scientific literacy.

Commitment to Professionalism:
All students in the School of Education are expected to maintain the highest professional and ethical standards. It is your responsibility to familiarize yourself with our Code of Ethics at http://campuslife.indiana.edu/Code.

Commitment to Diversity:
The School of Education at IUSB is committed to preparing pre-service and in-service teachers, school leaders, and school counselors to support learning for all students. Each class and learning experience helps teachers develop the knowledge, dispositions, and performances needed to meet the needs of students in today's diverse classrooms.

Commitment to Technology (required statement)
The School of Education at IUSB is committed to preparing pre-service and in-service teachers, school leaders, and school counselors who have the knowledge, dispositions, and performances needed to effectively use technology to help all students learn. Candidates are expected to incorporate technology throughout their course work and clinical experiences.

COURSE GOALS:
This course is intended to help you, the in-service or pre-service teacher, to build a content knowledge-base in the area of environmental science. You will also acquire the knowledge and skills to integrate an environmental consciousness into your classroom. This course will help you develop:
1. an appreciation for the complexity and dynamic character of our natural environment,
2. a recognition of man's interdependence with natural and man-made components of the environment,
3. an understanding of essential environmental principles,
4. an awareness of resources available for teaching environmental science
5. the opportunity to identify, collect and organize resources for teaching and assessing environmental concepts in your classroom,
6. a sense of responsibility and teaching strategies for helping children become accountable for the role they play as members of a very sensitive ecosystem.
COURSE PERFORMANCE OBJECTIVES:

With words and drawings, you should be able to:

1. list and describe causes for environmental problems (ignorance, attitudes, technology, population, synergism)
2. describe **basic environmental principles** that govern man's interaction in ecosystems
3. provide examples and describe purposes of **adaptations**
4. provide examples of **natural cycles**, such as water, oxygen-carbon dioxide, nitrogen. Tell how they work.
5. describe the dynamic characteristics of **ecosystems** (e.g., succession, energy flow)
6. show examples of various **relationships among organisms** within the ecosystem, such as predator-prey, symbiosis, decomposers, etc.)
7. predict **probable effects** when an ecosystem is altered.
8. describe sources, causes and effects of **water pollution**.
9. describe factors affecting water quality tests.
10. perform **water quality tests**.
11. give examples of sources, causes and effects of **air pollution**.
12. give examples of sources, causes and effects of **soil pollution**.
13. describe soil formation processes and soil properties.
14. determine the appropriate use for a described parcel of land.
15. describe the **uses of natural resources** with respect to renewability, depletion and recyclability.
16. describe energy relationships in an ecosystem.
17. compare sources and uses of **energy**.
18. compare alternative sources of **future energy**.
19. describe **conservation of energy** practices.
20. compare the environmental effects of **population** and **distribution**.
21. describe criteria to be used in making a **quality of life decision**.
22. compare the uses of **natural resources** with respect to quality of life.
23. locate and examine **resources for teaching** environmental science.
24. construct an inquiry-based curriculum project integrating the study of basic environmental laws and principles into your existing curriculum. (Add a coversheet, explaining how your project is inquiry-based and how it is driven by an **Essential Question** such as, How does an organism survive in its environment? or How do the oceans shape our lives? The project must meet the criteria stated in the rubric provided in class.)
### COURSE LINKS TO IUSB STANDARDS:

<table>
<thead>
<tr>
<th>IUSB Objectives</th>
<th>Performance Objectives (formative)</th>
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<tbody>
<tr>
<td>#1 Content Knowledge</td>
<td>The teacher:</td>
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<tr>
<td></td>
<td>- Effectively uses multiple representations and explanations of disciplinary concepts that capture key ideas and link them to students' prior understandings and engages students in generating knowledge and testing hypotheses according to the methods of inquiry and standards of evidence used in the discipline. [task: content based drawings and explanations required in assessments 1 and 2]</td>
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<td></td>
<td>- The teacher engages in generating knowledge and testing hypotheses according to the methods of inquiry and standards of evidence used in the discipline. [task: participation in in-class hands-on and lab activities]</td>
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<td></td>
<td>- Develops, evaluates, and uses interdisciplinary curricula that encourage students to see, question, and interpret ideas from diverse perspectives. [task: construction of the Inquiry-based curriculum project]</td>
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<tr>
<th>#2 Child Growth and Development</th>
<th>The teacher:</th>
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<tr>
<td></td>
<td>- The teacher uses teaching approaches that are sensitive to the multiple experiences of learners and that addresses different learning and performance modes. [task: construction of the Inquiry-based curriculum project]</td>
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<td></td>
<td>- Assesses individual and group performance in order to design instruction that meets learners' current needs in each domain (cognitive, social, emotional, moral and physical) leading to the next level of development. [task: construction of the Inquiry-based curriculum project and its accompanying overview document]</td>
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<td></td>
<td>- Stimulates student reflection on prior knowledge and links new ideas to already familiar ideas, making connections to students' experiences, providing opportunities for active engagement, manipulation, and testing of ideas and materials, and encouraging students to assume responsibility for shaping their learning tasks. [task: construction of curriculum project]</td>
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<tr>
<th>#3 Diversity</th>
<th>The teacher:</th>
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<tr>
<td></td>
<td>- Identifies, designs, and implements instruction appropriate to the students' stages of development, learning styles, strengths, and needs. [task: construction of the Inquiry-based curriculum project]</td>
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<td></td>
<td>- Uses teaching approaches that are sensitive to the multiple experiences of learners and that address different learning and performance mode. [task: construction of the Inquiry-based curriculum project]</td>
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<th>#4 Instruction</th>
<th>The teacher:</th>
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<td></td>
<td>- Carefully evaluates how to achieve learning goals, choosing alternative teaching strategies and materials to achieve different instructional purposes and to meet students' needs. [task: construction of the Inquiry-based curriculum project]</td>
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<td></td>
<td>- Varies his or her role in the instructional process (e.g. instructor, facilitator, coach, audience) in relation to the instruction and the needs of students. [task: construction of the curriculum project]</td>
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</table>
|                | - Uses developmentally appropriate resources and instructional strategies to engage children in active learning opportunities that develop intellectual
| #5 Learning Environment | The teacher:  
- Applies the concepts of learning and inquiry to create learning experiences that inspire the excitement of learning and foster risk-taking and collaboration. [task: construction of the Inquiry-based curriculum project]  
- Engages students in individual and cooperative learning activities that help them develop the motivation to achieve, by, for example, relating lessons to students' personal interests, allowing students to have choices in their learning, and leading student to ask questions and pursue problems that are meaningful to them. [task: construction of the Inquiry-based curriculum project]  
- Helps the group develop shared values and expectations for student interactions, academic discussions, and individual and group responsibility that create a positive classroom climate of openness, mutual respect, support, and inquiry. [task: construction of the Inquiry-based curriculum project] |
|------------------------|---------------------------------------------------------------|
| #6 Communication       | The teacher:  
- Communicates in ways that demonstrate sensitivity to cultural and gender differences. [task: construction of the Inquiry-based curriculum project]  
- Uses a variety of media communication tools, including audio-visual aids and computers to enrich learning opportunities [task: construction of the Inquiry-based curriculum project] |
| #7 Instructional Planning | The teacher:  
- As an individual and a member of a team, selects and creates learning experiences that are appropriate for curriculum goals, relevant to learners, and based upon principles of effective instruction. [task: construction of the Inquiry-based curriculum project]  
- Creates short-range and long-term plans that are linked to student needs and performance, and adapts the plans to ensure and capitalize on student progress and motivation. [task: construction of the curriculum project] |
| #8 Assessment          | The teacher:  
- Appropriately uses and interprets a variety of formal and informal assessment techniques to enhance her or his knowledge of learners, evaluate students' progress and performances, and modify teaching and learning strategies. [task: construction of the Inquiry-based curriculum project which includes authentic assessments] |
| #9 Professionalism     | The teacher:  
- Pursues ongoing professional development and seeks out professional literature, colleagues, and other resources to support his/her own development as a learner and a teacher. [task: collaborative work done on the construction of the Inquiry-based curriculum project, participation in Project Wild workshop]  
- Draws upon professional colleagues within the school and other professional arenas as supports for reflection, problem-solving and new ideas, actively sharing experiences and seeking and giving feedback. [task: collaborative in-class work done on the construction of the Inquiry-based curriculum project] |
| #10 Collaboration      | The teacher:  
- Can identify and use community resources to foster student learning [task: participation in Project Wild Workshop] |
University and School of Education policies:

- Electronic mail (email) is the official means of communication with students at Indiana University South Bend. A student's failure to receive or read official university communications sent to the student's official email address does not absolve the student from knowing and complying with the content of the official communication. It is recommended that students check email messages at least once daily. The university provides a simple mechanism for students to forward email from the official university email address to another email address of the student's choice. However, students who choose to have email forwarded to another email address do so at their own risk.

- If you need adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated please make an appointment with me as soon as possible. My office hours are just before and after class and afternoons by appointment.

### STUDENT EVALUATION

<table>
<thead>
<tr>
<th>E555 Course Criterion Areas</th>
<th>Points</th>
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<tbody>
<tr>
<td>Participation in in-class activities and discussions</td>
<td>120</td>
</tr>
<tr>
<td>Assessment 1</td>
<td>100</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>50</td>
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<tr>
<td>Inquiry-based Curriculum Project</td>
<td>150</td>
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<tr>
<td><strong>Total Points</strong></td>
<td><strong>420</strong></td>
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**A special note about attendance:**

Your attendance at each class session is important. If you must miss a day of class, please confer with your instructor. Missing two or more days may necessitate withdrawing from the course.

**A special note about assessment:**

The assessments are intended to measure your ability to apply basic environmental principles learned in this class to our real world setting. Poster drawings (artistic talent does not count!) and essay questions are the tools used to measure your understandings. Rubrics will be provided to communicate specific expectations for the assessments as well as for the inquiry-based curriculum project.
E521 Grading Standards

A = 92-100%
B = 84-91%
C = 76-83%
D = 68-75%

TENTATIVE CLASS SCHEDULE:

Session 1
  Overview of course and assignments
  The Curriculum Project requirements
  What is Environmental Science?
Session 2
  How does Earth really work?
  How is Earth affected by the universe around it?
Session 3
  What are the basic environmental cycles and principles operating on Earth?
Session 4
  What is the chemistry of water?
  What properties does water have?
  Where does our water come from?
  How can we protect the quality of our water?
Session 5
  How do we measure the quality of our water? (Water quality lab)
  How safe is our water?
Session 6
  Field trip to a county park: “Seeing” the basic environmental laws and cycles in action.
Session 7
  What are bacteria and viruses? How do they affect us?
  Are pandemics real?
Session 8
  Assessment 1
  Individual assistance with Curriculum Projects
Session 9
  What is air? Where does it come from? What’s in it? How can we protect its quality? How does our atmosphere protect us?
Session 10
  *Project Wild/Aquatics Workshop (a 6-hour off-campus workshop)
Session 11
What is soil? Where does it come from? What's in it?
How do we protect our soil's quality?
Session 12
How do we use our land? Who decides?
What issues are involved in land use?
Session 13
Where does hazardous waste come from?
How does hazardous waste affect us?
Session 14
Can we sustain ourselves into the future?
Session 15
Curriculum Project presentations
Assessment 2

*A special note about the calendar:
The Project Wild/Project Aquatics workshop is a 6 hour workshop. Please plan your schedule for this extended class time.

Some important resources:
*Science and Children*, is a professional journal for elementary teachers published by the National Science Teachers Association (NSTA). Copies are available in the campus library.

NATIONAL SCIENCE EDUCATION STANDARDS, National Research Council. This is the landmark resource written to provide a coherent vision of what it means to be scientifically literate. It describes exemplary teaching practices, key criteria for assessing and analyzing achievement in science as well as showing teachers how to develop the physical and support resources needed for developing high quality science programs. This is available online at:
http://www.nap.edu/readingroom/books/nses/html/

Some Web resources:
The National Science Education Standards (NSES):
http://www.nap.edu/readingroom/books/nses/html/
Indiana Academic Standards: www.doe.state.in.us/
National Science Teachers Association: www.NSTA.org
The Exploratorium Institute for Inquiry: www.exploratorium.com/IFI/
Project 2061: www.project2061.org
The National Science Resources Center: www.sci.edu/nsrc
The Eisenhower National Clearing Center: www.enc.org