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Office of the Registrar
FORM 40G REV. 12/09

PURDUE UNIVERSITY

REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

Print Form

EFD 13-10

DEPARTMENT Agricultural and Biological Engineering

EFFECTIVE SESSION ~~201110~~ SP 2011

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [X] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	ABE	Subject Abbreviation	
Course Number	52200	Course Number	
Long Title	Ecohydrology		
Short Title	ECOHYODROLOGY		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[ ] Summer [X] Fall [ ] Spring

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [X] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6. Registration Approval Type
Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Ecohydrology links hydrological and ecological processes at various spatiotemporal scales and is considered to be one of the most exciting frontiers of the future. Hydrological processes in individual ecosystems and the role of water in linking the myriad components of the landscape will be explored in this three-credit course. Interactions between hydrological and biological processes and factors that regulate and shape these interactions will be covered. The ecohydrology principles covered will include integration of water and biota at the catchment scale, nutrient transport and cycling, modeling ecohydrologic processes, and quantification of ecosystem services. Recommended: a prior course in hydrology.

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Undergrad Curriculum Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	Undergrad Curriculum Committee	Date
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate Council	
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date	Graduate Council Secretary	Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

5/24/2010 ENGR

R. Cipra 9-7-2010

2/8/10

2-18-10

OFFICE OF THE REGISTRAR

Engineering Faculty Document No. 73-10
04/09/2010

TO: The Faculty of the College of Engineering
FROM: Department of Agricultural and Biological Engineering
RE: New Graduate Course, ABE 52200 Ecohydrology

The faculty of the Department of Agricultural and Biological Engineering have approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ABE 52200 Ecohydrology
Term Offered: Fall, Lecture 3, Cr. 3
Requisites: ABE 32500 or AGRY 33700 or CE 54200 or Graduate Status

Description: Ecohydrology links hydrological and ecological processes at various spatiotemporal scales and is considered to be one of the most exciting frontiers of future. Hydrological processes in individual ecosystems and the role of water in linking the myriad components of the landscape will be explored in this three-credit hour course. Interactions between hydrological and biological processes and factors that regulate and shape these interactions will be covered. The ecohydrology principles covered will include integration of water and biota at a catchment scale, nutrient transport and cycling, modeling ecohydrologic processes, and quantification of ecosystem services.

Reason: No such course is currently available at Purdue. This course will be listed as one of the elective courses for the Ecological Sciences and Engineering graduate students. Development of such a course will potentially attract high quality graduate and undergraduate students who are interested in studying ecohydrology. It should be noted that a number of other U.S. and international universities (e.g., Cornell University, Indiana University, University of South Florida, University of Vienna-Austria) currently offer similar courses to their students.
The course was taught as ABE 590 in Spring 2008 (9 students enrolled) and Fall 2009 (10 students enrolled). It is anticipated that approximately 50% of the students will be from ABE and the remaining from other departments/programs, such as Forestry and Natural Resources, Civil Engineering, Earth and Atmospheric Sciences, Ecological Sciences and Engineering, and the Division of Environmental and Ecological Engineering.

Bernard A. Engel
Professor and Head
Agricultural and Biological Engineering Department

Date: April 5, 2010

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes #26
Date 5/13/10
Chairman ECC R. Cipra

Supporting Document for a New Graduate Course

TO: Purdue University Graduate Council

FROM: Indrajeet Chaubey
Agricultural & Biological Engineering
West Lafayette

DATE: April 5, 2010

SUBJECT: Proposal for New Graduate Course-Documentation
Required by the Graduate Council to Accompany
Registrar's Form 40G

Contact for information if questions arise:

Name: Indrajeet Chaubey
Phone Number: 45013
Email: ichaubey@purdue.edu
Campus address: ABE/ABE

Course Subject Abbreviation and Number: ABE 52200

Course Title: Ecohydrology

A. Justification for the Course:

- No such course is currently available at Purdue. This course will be listed as one of the elective courses for the Ecological Sciences and Engineering graduate students. Development of such a course will potentially attract high quality graduate and undergraduate students who are interested in studying ecohydrology. It should be noted that a number of other U.S. and international universities (e.g., Cornell University, Indiana University, University of South Florida, University of Vienna-Austria) currently offer similar courses to their students.
- The course was taught as ABE 590 in Spring 2008 (9 students enrolled) and Fall 2009 (10 students enrolled). It is anticipated that approximately 50% of the students will be from ABE and the remaining from other departments/programs, such as Forestry and Natural Resources, Civil Engineering, Earth and Atmospheric Sciences, Ecological Sciences and Engineering, and the Division of Environmental and Ecological Engineering.

B. Learning Outcomes and Method of Evaluation or Assessment:

Course objectives:

- Understand emerging area of ecohydrology related to different ecosystems including linkages among biological and physical processes at river basin scale
- Quantify ecosystem services from various land use activities
- Understand nutrient processes in various ecosystems
- Understand modeling principles related to ecohydrologic processes

- Apply ecohydrologic models in developing sustainable ecosystems plans
- Critically analyze recent scientific literature related to ecohydrology and watershed management.

Student learning outcomes that address the objectives:

This course will prepare students (both undergraduate and graduate) to meet the following learning outcomes:

- Professional Preparation
- Technological literacy
- Scientific Principles
- Critical thinking and problem solving
- Communication (oral, written)

The grade for this course will be determined by the following activities:

Homework and quizzes	30%	
Paper presentations		10%
Exams (2)		40%
Term Project		20%
Total		100%

The following scale will be used to determine the final letter grade:

A+, A = (93-100)%, A-=(90-92.9)%, B+ = (87-89.9)%, B = (83-86.9)%, B- = (80-92.9)%, C+ = (77-79.9)%, C = (73-76.9)%, C- = (70=72.9)%, D+ = (67-69.9)%, D = (63-66.9)%, D- = (60-62.9)%, F = (59-0)%

C. Prerequisite(s):

- Requisites: ABE 32500 or AGRY 33700 or CE 54200 or Graduate Status

D. Course Instructor(s):

- Dr. Indrajeet Chaubey, Associate Professor
  Agricultural & Biological Engineering

- Instructor is currently a member of the Graduate Faculty

E. Course Outline:

Week	Topic
1	Introduction to Ecohydrology
2	Linking biological and physical processes a the river basin scale
3	Patterns and processes in the catchment
4	Nutrient processes in consequences
5	Nutrient processes and consequences
6	Lotic vegetation processes
7	Fluvial Geomorphology, sediment transport in streams and their impact on aquatic, Exam 1
8	Modeling Ecohydrologic Processes: model set up and sensitivity analysis.
9	Modeling Ecohydrologic Processes: model calibration, validation
10	Modeling Ecohydrologic Processes: model uncertainty analysis
11	Benefits and risks of ecohydroligic models to water resource management decisions, review of Exam 2
12	Nutrient budget modeling, Exam 2
13	Ecohydrological analysis to manage watersheds of contrasting climates
14	Ecosystem services, background
15	Quantification of ecosystem services

F. Reading List (including course text):

- Ecohydrology: Processes, Models and Case studies. D. Harper, M. Zalewski, and N. Pacini (editors). Cabi International.
- Various handouts distributed throughout the semester.

G. Library Resources:

Students are required to work on a semester long project. They avail library resources needed to successfully complete their semester projects.

H. Example of a Course Syllabus

Course Outline
ABE 591S: Ecohydrology
Agricultural and Biological Engineering Department
Purdue University

Instructor: Dr. Indrajeet Chaubey, Associate Professor
320 ABE
e-mail: ichaubey@purdue.edu
Phone: 494-5013 (work) 463-5063 (Home)
Homepage: https://engineering.purdue.edu/ABE/Fac_Staff/faculty_test.htm/faculty/Chaubey.htm

Hours: Open Door Policy

Teaching Assistant: Chetan Maringanti
Email: cmaringa@purdue.edu

Meeting time: 12:00 – 1:20 pm on Tuesday and Thursday

Meeting Place: ABE 212. Occasionally we will also meet in ABE computer lab where we will illustrate some of the ecohydrolgic concepts discussed in the class using AQUATOX model.

Course Description:

Ecohydrology links hydrological and ecological processes at various spatiotemporal scales and is considered to be one of the most exciting frontiers of future. Movement and storage of water are integral parts of landscape and ecosystem functioning. Hydrological processes in individual ecosystems and the role of water in linking the myriad components of the landscape will be explored in this three-credit hour course. Interactions between hydrological and biological processes and factors that regulate and shape these interactions will be coyered. The ecohydrology principles covered will include integration of water and biota at a catchment scale, evolutionarily established resilience and resistance of ecosystems to stress, and how ecosystem properties can be used as a management tool for biodiversity, water quality, and water quantity improvement. Prerequisite: a course in hydrology.

Required Textbook: Ecohydrology: Processes, Models, and Case Studies. Cabi International. ISBN 978-1-84593-002-8

Supplemental Materials: Throughout the semester several other hand outs including research papers from a number of journals will be provided.

Objectives: After the completion of this course, students should be able to:

1. Understand emerging area of ecohydrology related to different ecosystems including linkages among biological and physical processes at river basin scale
2. Quantify ecosystem services from various land use activities
3. Understand nutrient processes in various ecosystems
4. Apply ecohydrologic models in developing sustainable ecosystems plans
5. Critically analyze recent scientific literature related to ecohydrology and watershed management.

Class Procedures: Three lecture hours per week. Occasionally there will be guest lectures by experts from different areas related to the course.

Homework:

1. Homework will be due at the beginning of the class period listed as the due date. Late homework may be turned in for half credit up to the beginning of the next class. After such time no credit will be given. However, you must complete all the assignments to get a passing grade in the course.
2. Homework must be performed in standard engineering format. Because communication skills are extremely important for engineers, you should communicate your work effectively and clearly. All homework should be submitted on computer printouts. No handwritten homework will be accepted.

3. You are encouraged to work together with other students in the class. However, the work you turn in should reflect your own effort rather than a substantial copy of another student's work.
4. Students are expected to abide by academic honesty and ethics described in the Graduate Studies Catalog. Any academic dishonesty will automatically result in Grade F and will be reported to the Dean of Graduate School.

Evaluation:

The grade for this course will be determined by the following activities:

Homework and quizzes	30%
Paper presentations	10%
Exams (2)	40%
Term Project	20%
Total	100%

The following scale will be used to determine the final letter grade

A+, A = (93-100)%, A-=(90-92.9)%, B+ = (87-89.9)%, B = (83-86.9)%, B- = (80 – 82.9)%, C+ = (77-79.9)%, C = (73-76.9%), C- = (70-72.9%), D+ = (67-69.9)%, D = (63-66.9)%, D- = (60-62.9)%, F = (59-0)%

Attendance:

Attendance is optional. You must make sure that the homework is submitted on time. Also, your ability to do the homework and performance in the exams are dependent upon your attendance.

Announcements:

I will use both e-mail and a web-page designed for this class to post important announcements. Please visit the course web-page frequently. If you currently do not have an e-mail account, let me know and I will get one for you.

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. I will use email and web-pages to get information about changes in this course.

Students with disability: If you need an accommodation due to a disability, please make arrangements to discuss this with me during first two weeks of the semester.

Course Evaluation

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

Course Outline (tentative):

Week	Topic
1	Introduction to Ecohydrology
2	Linking biological and physical processes a the river basin scale
3	Patterns and processes in the catchment
4	Nutrient processes in consequences
5	Nutrient processes and consequences
6	Lotic vegetation processes, Review of Exam
7	Ecohydrologic modeling: introduction, Exam 1
8	Modeling Ecohydrologic Processes: model set up and sensitivity analysis.
9	Modeling Ecohydrologic Processes: model calibration, validation
10	Modeling Ecohydrologic Processes: model uncertainty analysis
11	Benefits and risks of ecohydroligic models to water resource management decisions, review of Exam 2
12	Nutrient budget modeling, Exam 2
13	Ecohydrological analysis to manage watersheds of contrasting climates
14	Ecosystem services
15	Synthesis of Topics/term project presentations