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

Graduate Council Doc. No. 10-11b
EFD 14-10

DEPARTMENT Agricultural and Biological Engineering

EFFECTIVE SESSION 2011/10 ~~SP 2011~~ Spring 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	52900	Course Number	
Long Title	Nonpoint Source Pollution Engineering		
Short Title	NONPOINT SOURCE POLLUTION ENGR		

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

TERMS OFFERED
Check All That Apply:
[ ] Summer [ ] Fall [X] 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 [X]
4. Thesis Credit: Yes [ ] No [X]

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):

Prerequisite: ABE 32500 or AGRY 33700 or CE 54200 or Graduate Status. Engineering principles involved in assessment and management of nonpoint source (NPS) pollution. Effect of NPS pollution on ecosystem integrity. Use of GIS/mathematical models to quantify extent of pollution. Design/implementation of best management practices to reduce nonpoint source pollution and improve water quality. Discussion of total maximum daily load (TMDL) principles and processes.

Professor Chaubey.

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
			9/24/2010	R. Capia	9-7-2010
Indianapolis Department Head	Date	Indianapolis School Dean ENGR	Date	Undergrad Curriculum Committee	Date
				APPROVED 11/18/10	
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate Council	
	2/8/10		2.18.10	Susan L. Rayne	11/18/10
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date	Graduate Council Secretary	Date
T.A. Wenstrom	11/18/10				
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

12/7/10

12/27/10

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Course Number	52900	Course Number	

Long Title: Nonpoint Source Pollution Engineering

Short Title: NONPOINT SOURCE POLLUTION ENGR

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Maximum Cr. Hrs. ____
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4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
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2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
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Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

ENGR 2/4/2010 — R. Capia 9-7-2010 — 2/8/10 — 2.18.10

OFFICE OF THE REGISTRAR

Engineering Faculty Document No. 74-10
04/05/2010

TO: The Faculty of the College of Engineering
FROM: Department of Agricultural and Biological Engineering
RE: New Graduate Course, ABE 52900 Nonpoint Source Pollution Engineering

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 52900 Nonpoint Source Pollution Engineering
Term Offered: Spring, Lecture 3, Cr. *3*
Prerequisites; ABE 32500 or AGRY 33700 or CE 54200

Description: Engineering principles involved in assessment and management of nonpoint source (NPS) pollution. Effect of NPS pollution on ecosystem integrity. Use of GIS/mathematical models to quantify extent of pollution. Design/implementation of best management practices to reduce nonpoint source pollution and improve water quality. Discussion of Total Maximum Daily Load (TMDL) principles and processes.

Reason: No such course is currently available at Purdue. This course will form one of the technical or design electives in ABE. In addition, the course will also be listed as one of the courses for DEEE, ESE, and ENRE students. Development of such a course will potentially attract high quality graduate and undergraduate students who are interested in a career in natural resources engineering, watershed management, and water quality. The skill sets developed in this course are currently in high demand by a number of state, federal, and local agencies, and private consulting firms. It should be noted that a number of other U.S. universities currently offer a similar course to their students.

The course was taught twice (Spring 2003 and Spring 2005) by the same instructor at the University of Arkansas. The average enrollment was 10 students. It is anticipated that approximately 50% of the students will be from ABE and 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 52900

Course Title: Nonpoint Source Pollution Engineering

A. Justification for the Course:

- No such course is currently available at Purdue. This course will be one of the technical or design electives in ABE. In addition, the course will also be listed as one of the courses that can be taken by DEEE, ESE, and ENRE students. Development of such a course will potentially attract high quality graduate and undergraduate students who are interested in a career in natural resources engineering, watershed management, and water quality. The skill sets developed in this course are currently in high demand by a number of state, federal, and local agencies, and private consulting firms. It should be noted that a number of other U.S. universities currently offer similar courses to their students.
- The course was taught twice (Spring 2003 and Spring 2005) by the same instructor at the University of Arkansas. The average enrollment was 10 students. 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 sources and nature of NPS pollution originating from agricultural and urban land use.
  - Link nature of diffuse pollution with physical, chemical and biological integrity of ecosystems and water usage.

- Quantify amount of diffuse pollution from a watershed using state-of-the-art methods and models.
- Design best management practices to minimize nonpoint source pollution from agricultural and urban land use.
- Understand TMDL issues, and processes involved in the developing TMDL plans.
- Understand basic monitoring and modeling principles.
- Apply engineering principles in developing a pollution prevention plan.

- 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	40%
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)%

C. Prerequisite(s):

- Prerequisite courses: ABE 325 or AGRY 337 or CE 542

D. Course Instructor(s):

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

- Instructor is currently a member of the Graduate Faculty

E. Course Outline:

1	Introduction to N PS pollution, history, types, current state-of-the-knowledge
2	Water quality issues. Effect of NPS pollution on ecosystem integrity, hydrologic considerations
3	Pollutant interactions with soil, sediment and water.
4	Erosion and sediment yield modeling: USLE, RUSLE, and WEPP
5	Stream flow measurement and sampling techniques to determine pollutant load.
6	Nutrient, pesticides and water quality impacts in agricultural watersheds
7	Best management practices (BMPs): concept, design, and implementation for nutrient and sediment control
8	BMPs, cont. **EXAM 1**
9	Urban diffuse pollution
10	Design of BMPs to control urban NPS pollution
11	Design of detention-retention facilities and wetlands,
12	NPS pollution assessment – modeling
13	TMDL: concept, principle, and design
14	TMDL cont.
15	Use of GIS and NPS models to develop pollution prevention plan. Design of watershed monitoring plan to assess NPS pollution
16	**Final Exam.** Project written report due

F. Reading List (including course text):

- Novotny, Vladimir. 2002. Water Quality: Diffuse pollution and watershed management. 2nd edition. Wiley. ISBN-10: 0471396338; ISBN-13: 978-0471396337.
- 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
ABE591P
Nonpoint Source Pollution Engineering

Instructor: Dr. Indrajeet Chaubey

320 ABE

e-mail: ichaubey@purdue.edu

Phone: 494-5013

Homepage: http://engineering.purdue.edu/ecohydrology

Hours: Open Door Policy

Class time: Tuesday, Thursday 12:00 pm to 1:15 PM

Course Description:

Engineering principles involved in assessment and management of nonpoint source (NPS) pollution. Effect of NPS pollution on ecosystem integrity. Use of GIS/mathematical models to quantify extent of pollution. Design/implementation of best management practices to improve water quality. Discussion of Total Maximum Daily Load (TMDL) principles and processes. Prerequisite: ABE325 or CE542 or AGRY399W.

Textbook: Novotny, Vladimir. 2002. Water Quality: Diffuse pollution and watershed management. 2nd edition. Wiley. ISBN-10: 0471396338; ISBN-13: 978-0471396338.

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

1. Understand sources and nature of NPS pollution originating from agricultural and urban land use.
2. Link nature of diffuse pollution with physical, chemical and biological integrity of ecosystems and water usage.
3. Quantify amount of diffuse pollution from a watershed using state-of-the-art methods and models.
4. Design best management practices to minimize nonpoint source pollution from agricultural and urban land use.
5. Understand TMDL issues, and processes involved in developing TMDL plans
6. Understand basic monitoring and modeling principles
7. Apply engineering principles in developing pollution prevention plan

Class Procedures: Three lectures per week. Occasionally, there may be a field trip planned.

Homework:

1. Homework will be due at the beginning of the class period listed as the due date. A late homework will result in a score 0 (zero). 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.
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 Undergraduate Studies Catalog. Any academic dishonesty will automatically result in Grade F and will be reported to the Dean of Students.

Evaluation:

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

Homework and quizzes	40%
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. But it will affect your class participation and presentation component of the final grade. Excused absences such as illness, official trips as part of other courses and religious holidays will not count against class participation and deadlines. Please notify me of an expected absence or see me after an absence as soon as possible.

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.

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 Outline (tentative):

Week	Lecture
1	Introduction to NPS pollution, history, types, current state-of-the-knowledge
2	Water quality issues. Effect of NPS pollution on ecosystem integrity, hydrologic considerations
3	Pollutant interactions with soil, sediment and water.
4	Erosion and sediment yield modeling: USLE, RUSLE, and WEPP
5	Stream flow measurement and sampling techniques to determine pollutant load.
6	Nutrient, pesticides and water quality impacts in agricultural watersheds
7	Best management practices (BMPs): concept, design, and implementation for nutrient and sediment control
8	BMPs, cont. **EXAM 1**
9	Urban diffuse pollution
10	Design of BMPs to control urban NPS pollution
11	Design of detention-retention facilities and wetlands,
12	NPS pollution assessment – modeling
13	TMDL: concept, principle, and design
14	TMDL cont.
15	Use of GIS and NPS models to develop pollution prevention plan. Design of watershed monitoring plan to assess NPS pollution
16	**Final Exam.** Project written report due