Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: Engineering, Agriculture  
   Department: Biosystems Engineering

2. Course Prefix and Number: BSEN 5520  
   3. Effective Term: Fall 2012

4. Course Title: Watershed Modeling
   Abbreviated Title (30 characters or less): Watershed Modeling

5. Requested Action:  
   - [ ] Re-number a course
   - [ ] Add a course
   - [ ] Re-visit a course
   - Current Course Number: BSEN 4520  
   - Proposed Course Number: BSEN 5520
   - Type of Revision:

6. Course Credit:  
   Contact/Group Hours  
   Scheduled Type (e.g.: Lab, Lecture, Practicum, Directed Study)  
   Weekly or Per Term?  
   Credit Hours  
   Anticipated Enrollment  
   Maximum Hours (Repeatability): 3  
   - Lecture  
   - Weekly 3  
   - 40  
   - Total Credit Hours: 3

7. Grading Type:  
   - [ ] Regular (ABCDF)  
   - [ ] Satisfactory/Unsatisfactory (S/U)  
   - [ ] Audit

8. Prerequisites/Corequisites:  
   Use “P,” to indicate a prerequisite, “C,” to indicate a corequisite, and “P/C,” to indicate a prerequisite with concurrency.
   P: Departmental approval

9. Restrictions: List specific restriction in space above.  
   - [ ] College  
   - [ ] Major  
   - [X] Standing  
   - [ ] Degree

10. Course Description:  
    (20 Words or Less: exactly as it should appear in the Bulletin)  
    Modeling of non-point source pollution at the watershed scale using Soil and Water Assessment Tool model including underlying processes that control movement of pollutants.

11. May Count Either  
    (Indicate if this particular course cannot be counted for credit in addition to another)
    - Program Type
    (e.g.: minor, major, etc.)
    - Program Title
    (e.g.: MS in Chemistry, Performance Option, Minor in Art)
    - Requirement or Elective:
    (required or optional?)

12. Affected Program(s):  
    (Respond “N/A” if not included in any program; attach memorandum if more space is required)
    - Major
    - BS Biosystems Engineering

13. Overlapping or Duplication of Other Units’ Offerings:  
    (If course is included in any other degree program, is used as an elective frequently by other unit(s), or is in an area similar to that covered by another college/school, attach correspondence with relevant unit)
    - [ ] Applicable  
    - [ ] Not Applicable
14. Justification:
Course is already being taught. Change is for the ABM program

(Include a concise, yet adequate rationale for the addition/revision of the course, citing accreditation, assessments (faculty, graduate, and/or external) where applicable)

15. Resources:
No additional resources

(Indicate whether existing resources such as library materials, classroom/laboratory space, and faculty appointments are adequate to support the proposed addition/revision; if additional resources are required, indicate how such needs will be met, referencing the appropriate level of authorization -- i.e.: Dean -- where necessary; if no additional resources or shifting of resources will be necessary, respond “Not Applicable”)

16. Student Learning Outcomes:
(1) Learn processes simulated in the watershed scale, nonpoint source pollution model SWAT;
(2) Understand the linkages among the processes and the importance of spatial and tabular input data and parameters;
(3) Estimate NPS pollution from agricultural, forestry, and urban activities in a watershed using the SWAT model and simulate the effect of best management practices (BMPs);
(4) Learn to perform sensitivity and uncertainty analyses of a nonpoint source pollution model.

(State in measurable terms (reflective of course level) what students should be able to do when they have completed this course)

17. Course Content Outline:
Instructor: Dr. Puneet Srivastava
Rm 206 Corley Building
Phone: (334) 844-7426; E-mail: srivapu@auburn.edu
1. Credit Hours: 3 credit hours /week for 15 weeks
Prerequisite: BSEN 5510 or departmental approval
Corequisite: None

2. Text/Major Resources
Textbook: A textbook is not required for this class. We will use journal articles for this course (see example list below).

3. Course Description:
The course covers modeling of non-point source (NPS) pollution at the watershed scale. The transport of nutrients, sediment, pesticides, and pathogens from agricultural, forestry, and urban activities will be simulated using the SWAT (Soil and Water Assessment Tool) model. Emphasis is placed on the underlying processes that control the movement of pollutants through soils and with overland flow. The course will focus on evaluation of best management practices for the management and prevention of non-point pollution of surface and groundwater. Topics include science and policy affecting NPS pollution; climate (energy, atmospheric water, weather generator), hydrology (surface runoff, evapotranspiration, soil water, groundwater), nutrients and pesticides (nitrogen, phosphorus, pesticide), erosion (sediment, nutrient transport, pesticide transport, water quality.
parameters), land cover/land (growth cycle, optimal growth, actual growth),
management practices (general management, water management, urban
areas), and main channel processes (water routing, sediment routing, in-
stream nutrient processes, pesticide).

4. Course Objectives:
The specific objectives of the course are to:
(1) Learn processes simulated in the watershed scale, nonpoint source
pollution model SWAT;
(2) Understand the linkages among the processes and the importance of
spatial and tabular input data and parameters;
(3) Estimate NPS pollution from agricultural, forestry, and urban activities in
a watershed using the SWAT model and simulate the effect of best
management practices (BMPs);
(4) Learn to perform sensitivity and uncertainty analyses of a nonpoint
source pollution model.

5. Course Content and Schedule:
Week 1: Introduction
Week 1-2: Laws, regulations, and Policies Affecting Water-Pollution
including TMDL
Week 3: Climate Simulation in the SWAT model
Week 4: Hydrologic Equations in SWAT
Week 5: Simulation of Streamflows using SWAT
Week 6: Nutrients/Pesticide Equations in SWAT
Week 7: Erosion
Week 8: Land Cover/Plant
Week 9: Management Practices
Week 10: Main Channel Processes
Week 12: SWAT modeling of NPS pollution from a Watershed Sensitivity
and Uncertainty Analyses
Week 13-14: SWAT modeling of NPS pollution from a Watershed
Week 14-15: Discussion and Project Report

6. Course Requirements/Evaluation
The grade for the course will be determined from the two in-class mid-term
exams, homework sets, and the project report. The exams, or portions of
them, may or may not be open book - open notes. The course grade will be
determined as follows:
First Mid-term Exam 25%
Second Mid-term Exam 25%
Homework 50%
TOTAL 100%
Grade Assignment
A = 90 - 100 %
B = 80 - 89.9 %
C = 70 - 79.9 %
D = 60 - 69.9 %
F = below 60 %

7. Course Policy Statements:
Class Policy Statements
(a) Class Attendance: It is critical that you attend class regularly to be
successful in the course. Class attendance and participation will be taken
into consideration in case of a borderline final grade. If you miss a class, it
is the student's responsibility to become informed of any material presented
or assignments announced during an absence.
(b) Electronic devices: Only calculators approved by the National Council of
Examiners for Engineering and Surveying (NCEES) are permitted for use
on exams, quizzes, etc. The following are currently the only calculators
permitted: (1) Hewlett Packard – HP 33S, (2) Casio – FX 115MS or FX
115MSPlus (may have SR designation), (3) Texas Instruments – TI 30X
IIIs, and (4) Texas Instruments – TI 36X SOLAR. Students may check with
the instructor to see if any other calculator may be permitted. Use of other electronic devices with communication capabilities are also prohibited during exam or quiz periods (e.g. computers, cell phones, cameras, PDAs, beepers, pagers, iPods, Zunes, cameras, etc.) If these types of electronic devices are seen in use during the quiz or exam, they may be confiscated and the student may face disciplinary action through the academic honesty policy.

(c) Cell phones: To provide the optimal learning environment for all students, all cellular phones must be turned OFF or otherwise inactivated during class, lab, quiz, and exam periods. Text messaging or emailing during class is prohibited.

(d) Disputes over grades: All grade objections are to be submitted to the instructor in writing no later than one week after an assignment is returned to the class. Otherwise, grade objections will not be entertained. Grade objections should be very specific; i.e., objections that simply ask that a problem be re-graded without providing detailed explanation will not be considered. The original exam or assignment that corresponds with the objection must be submitted along with the written objection. All reviewed objections are final, and multiple objections for the same assignment by the same student are prohibited.

Auburn University Diversity Statement
Diversity at Auburn University encompasses the whole of human experience and includes such human qualities as race, gender, ethnicity, physical ability, nationality, age, religion, sexual orientation, economic status, and veteran status. These and other socially and historically important attributes reflect the complexity of our increasingly diverse student body, local community, and national population. Diversity is a core value at Auburn University. The Office for Diversity and Multicultural Affairs strives to offer a comprehensive range of exemplary educational programs that foster and sustain an environment that promotes academic excellence, respects differences, and accepts inclusiveness. Auburn University recognizes and values the considerable educational benefits emanating from diversity as we prepare our students for life and leadership in a multicultural world. Students who interact with and learn about people from a variety of backgrounds are more apt to understand, appreciate, and excel in the community they inhabit. In this context, diversity is aligned with Auburn University’s land grant mission of providing its students with a superior education in service to the needs of Alabama, the nation, and the world. More information can be found at www.auburn.edu/diversity/

Academic Honesty Statement:
Academic Honesty Policy: The Auburn University student academic honesty code can be found at https://sites.auburn.edu/admin/universitypolicies/Policies/AcademicHonestyCode.pdf. All academic honesty violations or alleged violations of code will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Students with Disabilities Statement:
Disability Accommodations: Students who need special accommodations in class, as provided for by the American Disabilities Act, should arrange a confidential meeting with the instructor during office hours the first week of classes - or as soon as possible if accommodations are needed immediately. You must bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have these forms but need accommodations, make an appointment with The Program for Students with Disabilities, 1244 Halley Center, 844.2096 or follow the steps on the website for the office to request for accommodation (https://fp.auburn.edu/disability/students/requestaccommodations.asp)

(Provide a comprehensive, week-by-week breakdown of course content, including assignment due dates)
18. Assignments / Projects:

First Mid-term Exam 25%
Second Mid-term Exam 25%
Homework 50%
TOTAL 100%

(List all quizzes, projects, reports, activities and other components of the course grade -- including a brief description of each assignment that clarifies its contribution to the course’s learning objectives)

19. Rubric and Grading Scale:

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<tr>
<th>Grade Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
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(List all components of the course grade -- including attendance and/or participation if relevant -- with point totals for each; indicate point totals and ranges or percentages for grading scale; for S/U grading, detail performance expectations for a passing grade)

20. Justification for Graduate Credit:

N/A

(Include a brief statement explaining how the course meets graduate educational standards (i.e.: rigorous standards for evaluation, development of critical thinking and analytical skills, etc.))

(Included below are standard statements regarding course policies. If necessary, a statement may be altered to reflect the academic policies of individual faculty members and/or the academic unit or department, provided that there is no conflict with the Tiger Cub, Faculty Handbook, or any existing university policy.)

POLICY STATEMENTS

Attendance: Although attendance is not required, students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence.

Excused Absences: Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please see the Tiger Cub for more information on excused absences.

Make-Up Policy: Arrangement to make up a missed major examination (e.g.: hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the advent of university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.

Academic Honesty Policy: All portions of the Auburn University student academic honesty code (Title XII) found in the Tiger Cub will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Disability Accommodations: Students who need special accommodations in class, as provided for by the Americans With Disabilities Act, should arrange for a confidential meeting with the instructor during office hours in the first week of classes (or as soon as possible if accommodations are needed immediately). The student must bring a copy of their Accommodation Letter and an Instructor Verification Form to the meeting. If the student does not have these forms, they should make an appointment with the Program for Students with Disabilities, 128B Haley Center, 844-2086 (V/TT).