Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: College of Engineering  
   Department: Industrial and Systems Engineering

2. Course Prefix and Number: INSY 3400  
   3. Effective Term: Fall 2014

4. Course Title: Stochastic Operations Research  
   Abbreviated Title (30 characters or less): Stochastic O.R.

5. Requested Action:  
   - ☐ Renumber a Course
   - ☐ Add a Course
   - ☑ Revise a Course

5.1. Current Course Number:  
   Proposed Course Number:  
   Type of Revision: Pre-req

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  
   | 3 | Lecture | Weekly | 3 | 100 |
   | | | | | 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: ENGR 1110 and MATH 2660 and a grade of C or better in STAT 3600.

9. Restrictions: List specific restriction in space above.  
   - ☐ College  
   - ☐ Major  
   - ☐ Standing  
   - ☐ Degree

10. Course Description:  
    (20 Words or Less; exactly as it should appear in the Bulletin)  
    Modeling and analysis of decision-making and operations subject to randomness including decision analysis, stochastic dynamic programming, Markov chains, and queuing theory.

11. May Count Either:  
   (Indicate if this particular course cannot be counted for credit in addition to another)
   Program Type or Program Title (e.g.: minor, major, etc.)
   (e.g.: MS in Chemistry, Performance Option, Minor in Art) (required or optional?)
   Major | Bachelor of Industrial & Systems Eng | Required
   Major |

12. Affected Program(s):  
    (Respond "N/A" if not included in any program; attach memorandum if more space is required)
    ☐ Applicable  
    ☑ Not Applicable

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)
14. Justification: STAT 3600 is a critical foundation for success in this junior level course. Our assessment tells us that 18% of students fail INSY 3400 which causes students' graduation dates to be delayed one year. A lack of preparation in probability and statistics is believed to be the cause of the high failure rate. It is believed that requiring students to earn a grade of C or better in STAT 3600 will motivate the students to focus more on learning the required material.

(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: Not Applicable

(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: This course covers the fundamentals of stochastic operations research, including Markov chains and Queueing Theory. Our goal is to understand how to build and use probabilistic models of simple production and service systems. This is an important prerequisite course to follow-on courses in manufacturing systems and simulation. This course relates to two of the department's stated ABET outcomes, a) an ability to apply knowledge of mathematics, science, and engineering; and b) an ability to design and conduct experiments, as well as analyze and interpret data. Students in this course build mathematical models of production and services systems and analyze the economic implications of decisions that are subject to uncertainty. Students also build a computer simulation model of a production system using a spreadsheet and compare the data generated by the computer model with the results provided by the analytical 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:

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<th>Topic</th>
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<tr>
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<td>Review of probability</td>
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<td>9/30/13</td>
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<td>Project 1</td>
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<tr>
<td>10/4/13</td>
<td>Markov chain applications</td>
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<td>10/7/13</td>
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11/18/13
11/20/13 Queueing Networks
11/22/13 Queueing Networks
12/2/13
12/4/13 Course Review
12/6/13
12/12/13 Final Exam (4:00–6:30PM)

(Provide a comprehensive, week-by-week breakdown of course content, including assignment due dates)

18. Assignments / Projects:

Doing the homework problems is critical to your success in the course. Unlike most textbooks, Ross uses homework problems to teach, not just to test whether you understood a particular section. Homework will not be collected, but feel free to have the TAs grade your homework if you like. There are programming assignments in the course. I will give details when we distribute the assignments. There will be three exams and a final. If you miss an exam with a valid, Tiger Cub excuse, you may take an oral make up exam, held in my office. Oral exams last about 30 minutes. If you do not have a valid excuse, you earned a zero on that exam.

(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:

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exams</td>
<td>60%</td>
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<tr>
<td>Programming</td>
<td>10%</td>
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<tr>
<td>Final exam</td>
<td>30%</td>
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</table>

Very Important! To earn a passing grade, the weighted average of your exams and final must be greater than 60%; that is,

\[
(0.3f + \text{sum of from i = 1 to 3 0.2ei})/0.9 >= 0.60 = \text{Passing Grade.}
\]

(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:

(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 Student Policy Handbook, 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 consult the Student Policy eHandbook 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 Student Policy eHandbook 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 accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with your office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/T/T).
Approvals

Department Chair / Head

College / School Curriculum Committee

College / School Dean

Dean of the Graduate School  (for Graduate Courses)

Assoc. Provost for Undergraduate Studies  (for Undergraduate Courses)

9-11-13
Date

10/8/13
Date

10/8/13
Date

Contact Person: LuAnn Sims
E-Mail Address: simslua@auburn.edu

Telephone: 334-844-1430
Fax: 334-844-1381
Dear Dr. Valenzuela,

Thank you for your email. I will let you know if I have questions.

Tin-Yau Tam  
Department Chair &  
Lloyd and Sandra Nix Professor  
Department of Mathematics and Statistics  
221 Parker Hall, Auburn University, AL 36849-5310, USA  
(334) 844-6572 (Office)  
(334) 844-6555 (Fax)  
e-mail: tamtiny@auburn.edu  
http://www.auburn.edu/~tamtiny

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From: Jorge Valenzuela <valenjo@auburn.edu>  
Date: Thu, 9 5, 13 10:48 AM  
To: Tin Yau Tam <tamtiny@auburn.edu>  
Cc: LuAnn Sims <simslua@auburn.edu>  
Subject: STAT 3600

Dear Dr. Tam,

Our department is proposing a change in our curriculum that requires our students to earn a grade of C or better in STAT 3600 in order to move on to our junior level class that has this course as a pre-requisite (specifically INSY 3400, Stochastic Operations Research). We have approximately an 18% failure rate in the course INSY 3400, and we believe that making this change will motivate our students to focus on learning the required material in STAT 3600 so they will be more successful in INSY 3400 and other related courses in our major.

Since your department teaches some of the sections of STAT 3600 to our students, we are informing you of this change. We are asking the curriculum committee to make this change effective for our course offering of INSY 3400 in Fall 2014.

Please let me know if you have any questions.

Best,

Jorge

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Jorge Valenzuela, Ph.D.  
Professor and Department Chair  
Industrial and Systems Engineering