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 3420
   3. Effective Term: Spring 2016

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

5. Requested Action:
   - [ ] Renumber a Course
   - [ ] Add a Course
   - [ ] Revise a Course
     - Current Course Number: 
     - Proposed Course Number: 
     - Type of Revision: Pre-req

6. Course Credit:
   - Contact/Group (e.g.: Lab, Lecture, Practicum, Directed Study)
   - Maximum Hours (Repeatability): 3
   - Scheduling Type: Lecture, Weekly 2, 100
   - Lab, Weekly 1, 100
   - Total Credit Hours: 3

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

8. Prerequisites/Corequisites:
   P: STAT 3610, COMP 3010/3013 and a grade of C or better in INSY 3400.

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)
    Simulation procedures for solving complex systems analysis problems.
    Emphasis on random processes, model building and construction of computer simulation models.

11. May Count Either:
    (Indicate if this particular course cannot be counted for credit in addition to another)
    [ ] or

12. Affected Program(s):
    (Respond "N/A" if not included in any program; attach memorandum if more space is required)
    (e.g.: minor, major, etc.)
    Program Type: Major
    Program Title: Bachelor of Industrial & Systems Eng
    Requirement or Elective? Required

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:

INSY 3400 is a critical foundation course for success in this junior level course. Our assessment tells us that approximately 15% of students fail INSY 3420 which causes students' graduation dates to be delayed one year. A lack of preparation in the stochastic operations research course 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 INSY 3400 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:

Students should understand the basic concepts of simulation modeling and analysis and have experience developing simulation models in Excel and the simulation package Simio. In addition, students should have experience using simulation models to analyze complex systems. ABET outcomes assessed in this course are:

(e) an ability to identify, formulate, and solve engineering problems where students are given an assignment to analyze input data, fit statistical distribution and conduct experiments using simulation model.

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice where students are given an assignment using Simio (simulation package) to develop a simulation model to analyze systems.

(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:

Week, Subject, Assignments/Exams Due
1. Introduction to Simulation
2. Random Variables and Generating Random Variates, Lab 1. Generating Random Variates
3. Monte Carlo Simulation, Homework 1 Due & Lab 2. Monte Carlo Simulation
4. Monte Carlo Simulation Cont'd, Homework 2 Due & Lab 3. Monte Carlo Simulation (Newsvendor Problem)
5. Basics of Queueing Theory, Homework 3 Due & Lab 4. Queueing Networks
6. Fundamental Concepts of Discrete Event Simulation, Homework 4 Due & Lab 5. Introduction to Simio
7. Review of Exam 1 Material, Homework 5 Due & Written Exam 1 & Lab 6. Simulation with Simio
8. Building Simple Models in Simio, Homework 6 Due & Lab Exam 1
9. Intermediate Modeling with Simio & Project Description and Deliverables, Lab 7. Simio (User-defined Statistics)
10. Intermediate Modeling with Simio Cont'd, Homework 7 Due & Lab 8. Video Lab (Flexible Manufacturing System)
11. Input Analysis, Project Proposal Presentation
12. Input Analysis Cont'd, Homework 8 Due
13. Verification and Validation, Lab Exam 2
14. Output Analysis, Project Model Presentation
15. Review of Exam 2 Material, Written Exam 2 & Final Project Presentation & Project Report Due

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

18. Assignments / Projects:

Homework and lab work will be important parts of the class and you should work alone on these unless otherwise stated in the assignment. You can
discuss certain aspects of the labs/assignments with your classmates, but you should complete these by yourself and turn in only your own work. Late homework/labs will be penalized by 50% per day. 

Format/Expectations for labs and other assigned work: Homework and lab submissions will be made on the course Canvas site. Submissions should be a single zip file containing all pertinent files. For the Simio files, make sure that you reset the experiment to reduce the file size before zippering. All assignments/labs should be accompanied by a Word file including a list of all files included in the zip archive along with any written material. The course project will be done in groups of 3 or 4 and will include a proposal, a model presentation/demonstration, and a formal project presentation on 4/25. Late projects will not be accepted.

(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)

| Course Requirements/Evaluation: Students will be evaluated based on the following: |
| Description | Date | Weight |
| Class Exam 1 | TBD | 20% |
| Class Exam 2 | TBD | 20% |
| Lab Exam 1 | TBD | 15% |
| Lab Exam 2 | TBD | 15% |
| Course Project Due | 4/25 | 15% |
| Labs/Homework | Miscellaneous | 15% |

You must average 60% or above on the four exams in order to pass the class.

(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 eHandbook, 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 my 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 Halsey Center, 844-2095 (VT).
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<tr>
<td>Department Chair / Head</td>
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<td>College / School Curriculum Committee</td>
<td>10/8/13</td>
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<td>College / School Dean</td>
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<td>Dean of the Graduate School (for Graduate Courses)</td>
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<td>Assoc. Provost for Undergraduate Studies (for Undergraduate Courses)</td>
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**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)  
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http://www.auburn.edu/~tamtiny

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