Course Syllabus  
Southeast Missouri State University

Department: Industrial and Engineering Technology  
Course No.: IM692

Title of Course: Modeling and Simulation  
Revision: New

I. Catalog Description and Credit Hours of Course:
   This course emphasizes the development of modeling and simulation concepts and analysis skills necessary to design, program, implement, and use computers to solve and analyze problems of complex systems/products. (3 credit hours)

II. Prerequisites: IM 691 and IM 311 or MA 223 or equivalent or Consent of the instructor

III. Objectives of the Course:
   1. To introduce the development of computer simulation and modeling systems using commercially viable software to support and automate manufacturing, industrial, and technical decision making.
   2. To enable students to acquire an understanding of the basic concepts and skills associated with computer simulation and modeling, decision theory and modeling of manufacturing, industrial, and technical decisions.

IV. Students Learning Outcomes:
   Students will:
   1. Apply probabilistic models in modeling real world systems.
   2. Implement a simulation of a model based on real world systems using commercially viable software.
   3. Analyze probabilistic distribution of data generated from the simulation model and correlate it to real world data.

IV. Expectation of Students:
   1. Students are expected read assigned materials.
   2. Students are expected to complete all assignments. Assignments will ONLY be accepted on the due dates provided, unless previous arrangements are made or student provides a written medical doctor's excuse.
   3. Students are expected to participate in class and group discussions
   4. Student work will be completed in accordance with Code of Student Conduct (http://www6.semo.edu/judaffairs/code.html)
   5. Students are expected to ensure their work areas are clean before leaving, in accordance with professional standards.
   6. Students are expected to complete all laboratory work during the regularly scheduled lab time.
V. Course content:
1. Review of Probability and Statistics
2. Queuing Theory
3. Random Numbers and random number generation
4. Queuing models
5. Statistical Models
6. Input Modeling
7. Simulation Software
8. Verification and Validation of Simulation Models
9. Output Data Analysis
10. Optimization of Simulation Models
11. Manufacturing System Simulation
12. Finals

VI. Textbook and Other Required Materials or Equipment:
Supplemental materials will be provided by the instructor.

VII. Student Evaluation:  

Grading Policy:

- Homework: 20%  
  - 90-100 A
- Labs: 20%  
  - 80-89.9999 B
- Class participation:* 5%  
  - 65-79.9999 C
- Mid-term Exam: 25%  
  - <65 F
- Final Exam: 30%

The weight of evaluation criteria may vary at the discretion of the instructor and will be indicated at the beginning of each course.

*: Participation includes in-class discussions and completing labs, homework, and exams within the assigned time slots.