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College of Engineering & Computer Science

Spring 2013

CS 4830-01/6830-01: Systems Simulation

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Course Syllabus

I. College/School **College of Engineering and Computer Science**
Department **Department of Computer Science and Engineering**

II. Course Information **ERIC BUCK**

Course Title: **Systems Simulation**

Course Abbreviation and Number: **CS 4830-01**

Course Cross Listing(s) Abbreviation and Number: **CS 6830-01**

Check ("x") all applicable:

General Education Course _____ Writing Intensive Course _____ Service Learning Course _____
Laboratory Course _____ Ohio TAG (Transfer Assurance Guide) Course _____
Ohio Transfer Module Course _____ Others (specify) _____

III. Course Registration

Prerequisites: **CS 3100 and (ISE 221 or STT 3600 or STT 3630)**

Corequisites: **None**

Restrictions: **None**

IV. Student Learning Outcomes and Objectives

- **Outcomes:**
 - **Ability to characterize and model real systems**
 - **Ability to construct simulation programs given a formal model**
 - **Familiarity with a simulation programming language**
 - **Ability to analyze, interpret, and communicate simulation results**
- **Objectives:**
 - **Explain the benefits of modeling and simulation in a range of application areas**
 - **Apply modeling and simulation**
 - **Evaluate a simulation highlighting benefits, limitations, and drawbacks**
 - **Effectively document plans, requirements, designs, and results**
 - **Demonstrate the ability to communicate effectively in writing:**
 - **Demonstrate understanding of course content**
 - **Demonstrate mastery of technical writing conventions**
 - **Show competency in standard edited American English**

V. Suggested Course Materials (required and recommended)

Example Required Text:

Simulation Modeling & Analysis 4th Edition Averill M. Law McGraw Hill Higher Education
ISBN 0072988436

VI. Suggested Method of Instruction

Lecture

VII. Suggested Evaluation and Policy

45% Projects (3 large systems to be modeled)

Each student models one or more subsystems for each large system. Subsystems are combined in class to simulate the overall system.

55% Technical Writing Assignments

Includes participation in formal guided peer reviews, actions, and production of process artifacts including documented resolution of actions

All Assignments must be submitted via Pilot drop

VIII. Suggested Grading Policy

A: 100-90, B: 89-80, C: 79-70, D: 69-60, F: less than 60.

IX. Suggested Assignments and Course Outline

Week	Topics/Activity
1	Introduction to simulation concepts, writing, and Simpy
2	Simulation methodologies: continuous, discrete, mixed
3-4	In-class analysis and demonstrations using Python / Simpy
5	In-class writing and process exercises
6	Building valid simulations
7	Mathematical basis for simulation: probability, statistics
8	Random number generators
9	In-class writing and process exercises
10	Selecting input distributions
11	Analysis of simulation output
12	Variance reduction techniques
13	Alternative simulation languages and resources
14	In-class project presentations

X. Other Information

Programming and writing assignments will include additional, more complex objectives for students enrolled in CS 6830.