COURSE DESCRIPTION

Department and Course Number	**CS 481**	Course Coordinator	**Reilly**
Course Title	**Simulation Models and Animations**	Total Credits	**3**

Current Catalog Description
Model development using popular simulation languages, e.g., GPSS-H (with an introduction to SLX). Interfacing to statistical and graphical systems, (e.g., Excel or OpenOffice.org Calc Spreadsheet) and (interfacing) to an animation system such as Proof Animation (or Open_GL).

Textbook
Getting Started with GPSS-H, 2nd ed., by J. Banks, J. S. Carson, and J. N. Sy, Wolverine Software, 2003.
Using Proof Animation, by James O. Henriksen, 3rd ed., Wolverine Software, 2002.

References *None*

Course Goals
The main idea behind the course is to gain competence in a portion of modeling & simulation (aka model building and exercising), particularly, in relation to discrete stochastic models (quite useful in modeling computer systems and networks). We aim to cover all the examples in a text such as the Banks et al. book (in succession) as a launching device for modeling systems with parallel and sequential services and feedback. We outline Proof Animation features to get students started in animating such systems.

Prerequisites by Topic
Algorithms and Data Structures, basic probability and statistics, with software concepts (e.g. lifecycle basics)

Major Topics Covered in the Course
Varieties of simulation, rigorous specifications of queuing system models, statistical view on inputs and outputs, verification and validation, principles applied to achieving animations that represent systems well and artistically, if applicable.

Laboratory projects (specify number of weeks on each)
Lab work consists primarily in project work, with formal write-ups and oral presentations. Sometimes smaller homework problems are introduced to make specific points.

Estimate CSAB Category Content

	CORE	ADVANCED		CORE	ADVANCED
		3			7
Data Structures			Computer Organization and Architecture		
		20			10
Algorithms Software Design			Concepts of Programming Languages		

Oral and Written Communications

Every student is required to submit at least 2 written reports (not including exams, tests, quizzes, or commented programs) of typically 5-10 pages and to make 1 oral presentation of typically 10-20 minutes duration. Material is graded primarily for technical content and relationship to course material, clarity of presentation (mainly a matter of organization), completeness, and accuracy.

Social and Ethical Issues

Honesty in collecting data and in model results interpretations. Following rules in team project work.

Theoretical Content

Probability and statistics – up to 35% of the course. Remarks on algorithms and complexity, programming language theory, software engineering add up to 15% or more.

Problem Analysis

Every problem approached requires analysis - i.e. problems must be analyzed in order to set goals beyond ones stated - i.e. "value added" is a requirement.

Solution Design

Almost all outside work goes through a complete life cycle of analysis, design, implementation and testing.