Sam Houston State University

Department of Computer Science

COSC 4320: System Modeling and Simulation
Syllabus
Spring 2018

General Information

Instructor: Dr. Peter A. Cooper
Office: AB1 214
Phone: 294 1569
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Course Title: System Modeling and Simulation
Course Code: COSC 4320
Couse Day/Time MW 2:00 – 3:20

Course Description

This is an introduction to modeling and simulation for analysis of computer software and hardware. Application of simulation analysis to design and development of computer software and systems including modeling of computer and software components will be discussed. Design, coding and use of discrete event simulation software will be covered. Credit: 3 hrs.

Course Materials

Textbook:
Sayama, H. "Introduction to the Modeling and Analysis of Complex Systems". Open SUNY. Available as a free download at http://textbooks.opensuny.org/introduction-to-the-modeling-and-analysis-of-complex-systems/

Software:
Canopy. Available as a free download from https://www.enthought.com. Alternatively, a Python Integrated Development Environment of your choice. The Instructor is willing to troubleshoot technical problems in Canopy, but not in other IDE's.

Course goals

At the end of this course the ideal student should be able to

- Develop mathematical models for discrete-time and continuous-time nonlinear dynamical systems.
- Implement discrete-time and continuous-time nonlinear dynamical systems as Python programs.
- Interpret 2-dimensional and 3-dimensional graphical output to determine the behavior of complex systems

Teaching Strategy

This class has been designed as a seminar class. The class will meet each Monday and Wednesday as per the schedule. Students will be assigned readings each week and will prepare materials for presentation and discussion. Students will then be expected to implement specific models and systems.

Grading Criteria

The course will be graded using the following rubric

Grading Item	**Count**	**Points**	**Total**
In-class Presentation	4	50	200
Coding Assignment	10	50	500
Mid-term Examination	1	100	100
Final Examination	1	200	200
Total			**1000**

Grading Scale

900+	A
800-899	B
700-799	C
600-699	D
<600	F

There will be no late work accepted, no handwritten work accepted, no make-up exams conducted except as specifically required by university policy, or with advanced approval from the Instructor.

Course Topics

- Fundamentals of Modeling
- Basics of Dynamic Systems
- Discrete-Time Models
- Continuous-Time Models
- Bifurcation
- Chaos
- Cellular Automata
- Field Models
- Dynamic Network Modeling
- Agent-Based Models

Attendance Requirements

In accordance with University Policy, regular attendance is required. However, no points will be awarded or subtracted based on your attendance. You are responsible for all material covered in every class, regardless of whether you attended or not. It is your responsibility to obtain notes, assignments, etc., from fellow class members if you miss a class.

Academic Dishonesty

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

All student will be required to sign acknowledgement and understanding of the academic dishonesty expectations, and will be held, without question, to those standards.

Classroom Conduct

Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Please turn off or mute your cellular phone and/or pager before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking among each other at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a, minimally, a directive to leave class or being reported to the Dean of Students for disciplinary action in accordance with university policy.

Visitors in the Classroom
Occasion visiting of classes by responsible persons is allowed with prior arrangement with the instructor, as long as it does not interfere with the registered members of the class or the educational process.

Americans with Disabilities Act
Students with disabilities covered by the Americans with disabilities Act should go to the Counseling Center and Services for Students with Disabilities (SSD) in a timely manner to obtain the documentation required. Students are responsible for initiating the process of documenting the need for an accommodation under the ADA act.

Religious Observance
University policy allows for student to observe religious holy days without penalty. If you intend to miss class as a result of the observance of a religious holy day or as a result of the necessary traveling time required for religious observance, such an absence will not be penalized. As a courtesy, it would be appreciated if you notify the instructor in advance in writing, of the dates and times of class sessions that are to be missed. Students absent from class as a result of religious observance are required to submit any due assignments immediately on their return to the classroom. Makeup tests and quizzes will also be provided on return to the class.

Office Hours

- MW 10:30 – 11:30

The most effective way of contacting me is by email: **cooper@shsu.edu**