Syllabus
CSC 840 – Modeling and Simulation Theory and Application
Fall 2018

Time & Place	Tue., Thur., 10:00-11:45am, Classroom South 326
Instructor	Dr. Xiaolin Hu (Email: xhu@gsu.edu)
Office Hours	Tue., Thur., 2:00-3:30pm, 25 Park Place 746
TA	Suganya Gunanathan (sgunanathan1@student.gsu.edu),
Office hour: Mon./Wed., 12-1:30 PM, 25 Park place, 6 floor, Cubicle 650 N
Web Page	http://www.cs.gsu.edu/xhu/CSC840/csc8840.htm
Textbook & Software
• Users-Guide for using DEVSJAVA modeling and simulation software tool (Available online)
• DEVSJAVA Modeling & Simulation Software including Source Code
• NetLogo: http://ccl.northwestern.edu/netlogo/

Course Description
The course teaches both theory and application of computer modeling and simulation. It covers fundamental concepts and in-depth discussions of modeling formalisms and simulation protocols. The course will discuss different modeling and simulation (M&S) paradigms, including discrete time M&S, discrete event M&S, agent-based M&S, and cellular automata M&S. Possible application domains of this course are abundant, including computer networks, manufacturing systems, social systems, biological systems, and business processes. Selected advanced topics will also be introduced based on students’ interests. The course will be conducted in a seminar format.

Objectives
To present concepts of computer M&S applicable to a wide variety of technological, natural, and social systems. To provide hands-on experience in computer M&S. Students are expected to complete the course with a sound foundation of computer M&S and a set of computer-based tools for constructing, simulating and analyzing dynamic models of complex systems.

Grading
The course will include three homework assignments and one term project (includes report and demonstration). The term project extends one of the homework assignments to a more complex level. All these are individual work. The total grade is broken down as follows (subject to change): homework 1 – 20%, homework 2 – 25%, homework 3 – 25%, term project – 25%, attendance – 5%.

Last Date for Withdrawal
Tuesday, October 9, 2018 (please double check with the registrar’s office)

Other
Disruptive classroom behavior will not be tolerated. Cell phones must be turned off during the class time. See the student catalog for more information. Class participation is strongly encouraged, please ask questions, and make comments.

Disclaimer
This syllabus represents a general plan for the course and deviations from this plan may be necessary during the duration of the course.
Lectures of this course roughly fall into two categories:

**Discrete event modeling and simulation as exemplified by DEVS**
- DEVS framework, DEVS models
- DEVSJAVA environment
- DEVS formalism
- DEVS simulator

**Topics in the general field of computer modeling and simulation**
- Systems concept, basics of modeling and simulation
- Discrete time model and discrete event model
- Agent-based modeling and simulation
- Cellular space modeling and simulation
- System dynamics models
- System Entity Structure
- Data assimilation
- Simulation performance, parallel and distributed simulation