# CS-558 Computer Simulation
# Course Syllabus
# Spring 2019

## Course Description

Methodology of simulation for discrete and continuous dynamic systems. State-of-the-art programming techniques and languages. Statistical aspects of simulation. Students will design, program, execute, and document a simulation of their choice.

## Prerequisites

Computer Science 310 and Statistics 550.

## Instructor

Dr. Raymond Madachy, rmadachy@sdsu.edu
Office: GMCS 536
Office hours: Tuesdays and Thursdays 4:30–5:30 PM

## Teaching Assistant

TBD

## Meetings

Tuesdays and Thursdays 5:30–6:45 PM, GMCS-333

## Textbook

R. Madachy and D. Houston, *What Every Engineer Should Know About Modeling and Simulation*, CRC Press, 2017

## Schedule

This is a tentative schedule that may be revised at the discretion of the Professor. Not shown are supplemental readings to be provided.

| Week | Date | Topics | Readings |
|---|---|---|---|
| 1 | 1/24/2019 | Course Overview and Introduction | |
| 2 | 1/29/2019 | M & S introduction | Ch. 1, Appendix A |
| | 1/31/2019 | M & S Introduction | |
| 3 | 2/5/2019 | Modeling Process | Ch. 2 |
| | 2/7/2019 | Modeling Process | |
| 4 | 2/12/2019 | Continuous Systems Modeling | Ch. 3.1 |
| | 2/14/2019 | Continuous systems Modeling | |
| 5 | 2/19/2019 | Continuous systems Modeling | |
| | 2/21/2019 | Exam 1 | |
| 6 | 2/26/2019 | Discrete Event Modeling | Ch. 3.2 |
| | 2/28/2019 | Discrete event Modeling | |

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| 7 | 3/5/2019 | Discrete event Modeling | |
| | 3/7/2019 | Discrete event Modeling | |
| 8 | 3/12/2019 | Agent-based Modeling | Ch. 3.3 |
| | 3/14/2019 | Agent-based Modeling | |
| 9 | 3/19/2019 | Exam 2 | |
| | 3/21/2019 | Randomness | Ch. 4.1 – 4.2 |
| 10 | 3/26/2019 | Randomness | |
| | 3/28/2019 | Monte Carlo Analysis | Ch. 4.4 |
| 11 | 4/2/2019 | Input Analysis | Ch. 5.1 – 5.3 |
| | 4/4/2019 | Estimating Parameters | Ch. 5.4 |
| 12 | 4/9/2019 | Exam 3 | |
| | 4/11/2019 | Model Execution | Ch. 6.1 – 6.4 |
| 13 | 4/16/2019 | Output Analysis | Ch. 6.5 |
| | 4/18/2019 | Output Analysis | |
| 14 | 4/23/2019 | Case Study | Ch. 7 |
| | 4/25/2019 | Student Presentations | |
| 15 | 4/30/2019 | Student Presentations | |
| | 5/2/2019 | Exam 4 | |

## Grading

Homework 40%
Exams 40%
Final Project 20%

## Syllabus Version

Updated January 23, 2019