

CMPE 576 Advanced Systems Simulation (Spring 2018)

Instructor: Prof. Dr. Doğu Arifler
Office Hours: TBA. Please refer to the course Web site.
Course Web Site: <http://cmpe.emu.edu.tr/courses/cmpe576>

The primary goal is to present methods for constructing and analyzing simulations for performance evaluation of computer systems and communication networks. Probabilistic and statistical aspects of system simulation will be emphasized with accompanying assignments that may require writing programs in C/C++ and/or MATLAB.

Course Description: Models and methods for system simulation. Review of probability. Random numbers. Generation of random variates. Monte Carlo simulation. Discrete event simulation. Validation of simulation. Statistical analysis of simulation results.

Textbook: S. M. Ross, *Simulation*, 4th ed., Academic Press, 2006.

Important Dates: Midterm Exam: 10 April 2018 (in class), Final Exam: 22 May 2018 (in class).

Grading Policy: Midterm 40%, Final 40%, Homework 20%.

Make-Up Policy: Only one **comprehensive** make-up examination will be given to those who miss any of the exams. The make-up exam will be given to only those who provide a valid excuse in writing within the next three working days following the missed exam. This rule is a University by-law, and I **will** enforce it. Students who miss an exam due to a serious medical condition are required to provide official documentation (doctor's report approved by the Student Health Center). However, eligibility to take the make-up exam will still be **subject to my approval**.

Academic Dishonesty: Any conduct that attempts to gain unfair academic advantage is considered academic dishonesty. Copying labs and assignments, cheating during exams, substituting for another person are some examples of academic dishonesty. Cases of academic dishonesty **will not** be tolerated and will be punished according to EMU's disciplinary policies.

Tentative Outline: Below is a tentative outline for this course. I reserve the right to adjust the pace and topics of the class as the semester progresses.

Week 1	Introduction (Ch. 1)
Weeks 2 & 3	Elements of probability, random numbers (Ch. 2 & 3)
Week 4	Discrete random variable generation (Ch. 4)
Weeks 5 & 6	Continuous random variable generation (Ch. 5)
Week 7	Monte Carlo simulation and communication system simulation
Week 8	Discrete event simulations (Ch. 6)
Weeks 9 & 10	Midterms
Week 11	Queueing systems simulation and simulating a packet switch
Week 12	Statistical analysis of simulated data (Ch. 7)
Week 13	Statistical validation techniques (Ch. 9)
Week 14	Comparing systems
Week 15	Review and concluding remarks
