

CSCE 317 - Computer Systems Engineering

Credit Hours: 3 hours

Contact Hours: 3 lecture hours

Instructor: Dr. Valtorta

Required Textbooks: Mor Harchol-Balter. Performance Modeling and Design of Computer Systems: Queueing Theory in Action. Cambridge University Press, 2013 (ISBN 9781107027503).

Bulletin Description: System-level modeling and evaluation of computer systems: requirements elicitation and specification, architectural design, reliability and performance evaluation, Markov modeling, life-cycle cost analysis, project management.

Prerequisites: CSCE 212, MATH 242, STAT 509

Required Course in CE program

Learning Outcomes: Students will be able to:

1. Take an overall system and lifecycle view of the design and operation of a system.
2. Model and evaluate the reliability of system architectures.
3. Model and evaluate the performance and dynamic behavior of a system.
4. Model and evaluate the economics of cash flows in system design, development, and operation.

Student (Program) Outcomes addressed by course (Detailed mappings of these course outcomes to the Student Outcomes of the programs are in the detailed syllabus and the Assessment plan.)

Student Program Outcomes	SOs supported	SOs Moderately supported
Computer Engineering	a, b, j, k	
Computer Information Systems		
Computer Science		

Topics covered and approximate weight:

1. Probability
2. Generating random variables
3. Sample Paths, Convergence, and Averages
4. Operational Laws
5. Modification Analysis
6. Discrete-Time Markov Chains
7. Ergodicity Theory
8. Examples: Google, Aloha, and Harder Markov Chains
9. Exponential Distribution and the Poisson Process
10. Continuous-Time Markov Chains