

## 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**
- **Course 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 Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	1, 2, 6
Computer Information Systems	N/A
Computer Science	N/A

### Topics covered

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