CSCE 317 - Computer Systems Engineering

- **Credit Hours:** 3 hours
- **Contact Hours:** 3 lecture hours
- **Instructor:** Dr. Valtorta
- **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**

<table>
<thead>
<tr>
<th>Program</th>
<th>Student Outcomes Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Engineering</td>
<td>1, 2, 6</td>
</tr>
<tr>
<td>Computer Information Systems</td>
<td>N/A</td>
</tr>
<tr>
<td>Computer Science</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**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