CSCE 317: Computer Systems Engineering

1. Course number and name: CSCE 317: Computer Systems Engineering

2. Credit: 3-hrs; Contact: 3 lectures of 50 minutes each or 2 lectures of 75 minutes each per week

3. Instructor: Spring 2011: John B. Bowles

4. Text book: None
   John B. Bowles "Introduction to reliability theory and practice", Annual Reliability and Maintainability Symposium Tutorial, 2001
   John B. Bowles, Class Notes: “Probability Review”, “Poisson Processes”, “Markovian Queing Systems”

5. Specific course information
   a. Catalog 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.
   b. Prerequisites: CSCE 212, MATH 242, STAT 509
   c. Required in CE curricula

6. Specific goals for the course
   a. Specific outcomes of instruction:
      • Take an overall system and lifecycle view of the design and operation of a system.
      • Model and evaluate the reliability of system architectures.
      • Model and evaluate the performance and dynamic behavior of a system.
      • Model and evaluate the economics of cash flows in system design, development, and operation.
   b. Relation of course outcomes to Student Outcomes: CE: see page 2; CS & CIS: see page 3

7. Topics covered and approximate weight (14 weeks, 3 hours/week, 42 hours total)
   1. Systems engineering overview
   2. Probability review
3. Engineering Economic models, life-Cycle cost analysis and comparison of alternatives
4. System Reliability models, design evaluation and comparison of alternatives
5. Markovian queueing system models
   c. System Performance models, bottleneck analysis and comparison of alternative architectures
## Computer Engineering

Relation of Course Outcomes to EAC Student Outcomes*

<table>
<thead>
<tr>
<th>Course Outcomes (CE)</th>
<th>Student Outcomes</th>
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</thead>
<tbody>
<tr>
<td>(a) <strong>d.</strong> Apply knowledge of mathematics, science, and engineering</td>
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</tr>
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<td></td>
<td>d. apply knowledge of mathematics, science, and engineering</td>
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</tbody>
</table>

### Criteria

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.

* 3 = major contributor, 2 = moderate contributor, 1 = minor contributor; blank if not related
### Computer Science & Computer Information Systems

Relation of Course Outcomes to CAC Student Outcomes*

<table>
<thead>
<tr>
<th>Course Outcomes (CS &amp; CIS)</th>
<th>Student Outcomes</th>
<th>All</th>
<th>CS</th>
<th>CIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Apply knowledge of computing and mathematics appropriate to the discipline</td>
<td>(b) Analyze a problem, and identify and define the computing requirements ...</td>
<td>(c) Design and implement a computer-based system, ...</td>
<td>(d) Function effectively on teams to accomplish a common goal</td>
<td>(e) An understanding of professional, ethical, legal, ... responsibilities</td>
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