**COURSE NUMBER:** IE 5111, 4 credits  
**COURSE TITLE:** Systems Engineering I

**TERMS OFFERED:** Fall  
**PREREQUISITES:** IT upper division or graduate student

**PREPARED BY:** Saif Benjaafar  
**DATE OF PREPARATION:** May 23, 2007

**COURSE LEADER(S):**  
Robert Monson, Ph.D.  
Lockheed Martin  
Adjunct Professor  
**CLASS/LABORATORY SCHEDULE:**  
2 hour lecture once per week  
**CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES:**  
100 % Engineering Topics

**CATALOG DESCRIPTION:**  
Overview of systems-level thinking/techniques in context of an integrated, design-oriented framework. Elements of systems engineering process, including lifecycle, concurrent, and global engineering. Framework for engineering large-scale, complex systems. How specific techniques fit into framework.

**COURSE TOPICS:**  
1. Elements of Systems Engineering  
2. Systems Thinking  
3. Concurrent Engineering  
4. Project Management  
5. Total Quality Management  
6. Products / Life Cycles  
7. Acquisition Models  
8. Requirements Development / Strategy  
10. Design Synthesis / Systems Architecture  
11. Risk Management  
12. Integration and Verification  
13. Reliability, Maintainability and Availability  
14. Usability / Human Factors  
15. Coherence in Systems Engineering

**COURSE OBJECTIVES**  
By the end of the course, students will be able to demonstrate a general knowledge of Systems Engineering methodologies and skills, and exhibit a heightened awareness of the challenges facing a Systems Engineer.
<table>
<thead>
<tr>
<th>COURSE OUTCOMES</th>
<th>(Letters shown in brackets are linked to program outcomes a-k)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Understand Systems Thinking [c, d, j, k]</td>
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<td>2.</td>
<td>Define and formulate the underlying requirements of a project [c, e, g]</td>
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<td>3.</td>
<td>Plan and document a project or program, including (1) performance specification, (2) project schedule, and (3) project budget [c, d, f, g]</td>
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<td>4.</td>
<td>Understand acquisition models and life cycle cost [a, e]</td>
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<td>5.</td>
<td>Understand functional analysis and systems architecture [c, e]</td>
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<tr>
<td>6.</td>
<td>Understand reliability, maintainability and availability [a]</td>
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<td>7.</td>
<td>Recognizing the value of coherence in systems engineering [c, d, e, k]</td>
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<tr>
<th>ASSESSMENT TOOLS:</th>
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<tbody>
<tr>
<td>1) Panel Presentation</td>
<td>20%</td>
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<tr>
<td>2) Exam - Midterm</td>
<td>20%</td>
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<tr>
<td>3) Term Paper</td>
<td>25%</td>
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<tr>
<td>4) Exam - Final</td>
<td>25%</td>
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<tr>
<td>5) Class Participation</td>
<td>10%</td>
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IE 5111

Nature of Changes
This syllabus is an entirely new document, no previous versions exist.