IE 3331 Systems Engineering
SE/EE 5341 Systems Engineering Fundamentals
SE/EE 4395 Special Topics-Electrical Engr.

Course Overview

This course covers all basic concepts of systems engineering. The objective is to provide the basic knowledge and tools for transforming an operational need into a well-defined system configuration, through an iterative design process of issue formulation, analysis, optimization, design synthesis, system integration, and testing.

Term projects should demonstrate systems engineering principles, concepts, tools and techniques through a realistic case study.

Textbook


Instructor Information

Instructor: Eric D. Smith
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Project

Design projects will employ Systems Engineering fundamentals.
Progress reports will take the form of a Need Statement, Conceptual Design Report, Preliminary Design Report, and Detailed Design Report.
Prior to the due date for each project report, a project reports and materials are due.
On the due date for each project report, a review will be conducted.
During the review, each group makes a PowerPoint presentation.
The instructor and class will ask questions and provide comments and suggestions which may be incorporated into the project report.
Projects will be submitted to student design competitions, and so the Detailed Design Report will take the form required for a particular design contest.
Design competitions for Fall 2009 are:
- PACE:
- NASA: Micro Gravity University
- HCI:
- EPA:
  (Other, as approved by instructor)
The alternative to a group project is an individual paper for the INCOSE conference, due Nov.
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<tr>
<th>Wk</th>
<th>Topics</th>
<th>Chapters*</th>
<th>DUE</th>
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<tbody>
<tr>
<td>1 Aug.27</td>
<td>Course Introduction System Definitions and Concepts</td>
<td>Chapter 1</td>
<td>Group formation</td>
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<tr>
<td>2 Sept.3</td>
<td>Bringing Systems Into Being</td>
<td>Chapter 2</td>
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<tr>
<td>3 Sept.10</td>
<td>Conceptual System Design Planning &amp; Organization, SEMP, PMP</td>
<td>Chapter 3</td>
<td>Need Statement</td>
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<td>4 Sept.17</td>
<td>Preliminary System Design</td>
<td>Chapter 4</td>
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<td>5 Sept.24</td>
<td>Detail Design and Development</td>
<td>Chapter 5</td>
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<td>6 Oct.1</td>
<td>Test and Evaluation</td>
<td>Chapter 6</td>
<td>Conceptual Design Report</td>
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<td>7 Oct.8</td>
<td>Alternatives and Models in Decision Making</td>
<td>Chapter 7</td>
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<tr>
<td>8 Oct.15</td>
<td>Optimization in Design and Operations Queuing Theory and Analysis Control Concept and Methods</td>
<td>Chapter 9</td>
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<td>Chapter 10</td>
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<td>Chapter 11</td>
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<tr>
<td>9 Oct.22</td>
<td>Design for Reliability Design for Maintainability</td>
<td>Chapter 12</td>
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<td>Chapter 13</td>
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<td>10 Oct. 29</td>
<td>Design for Usability Design for Supportability (Serviceability)</td>
<td>Chapter 14</td>
<td>Preliminary Design Report</td>
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<td>Chapter 15</td>
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<td>11 Nov.5</td>
<td>Design for Producibility and Disposable Design for Affordability (Life Cycle Cost)</td>
<td>Chapter 16</td>
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<td>Chapter 17</td>
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<td>12 Nov.12</td>
<td>System Engineering Planning and Organization Program Management and Control</td>
<td>Chapter 18</td>
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<td>Chapter 19</td>
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<tr>
<td>13 Nov.19</td>
<td>Review, Special Topics</td>
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<td>14 Dec.3</td>
<td>Final Project Presentation</td>
<td>Final Detailed Design Report</td>
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<td>15 Dec.10</td>
<td>Final Exam</td>
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* Systems Engineering and Analysis, B. S. Blanchard and W. J. Fabrycky, 4th edition, 2004
Exams

There will be two exams. Each exam will include material covered up to the exam date.

Homework

Chapter questions – found in Blackboard -- are due the week after the chapter is presented in class. Collaboration is allowed on homework.

Grading

Grades will be determined based on your exam scores and your project. Final grades will be based on overall class performance.

- **Exams**
  - Midterm 15%
  - Final 20%

- **Project**
  - Conceptual Design 5%
  - Preliminary Design 10%
  - Final 20%

- **Homework** 20%
- **Participation/Teamwork** 10%

Submission Requirements

Name your submitted documents this way: **Group1_3331_PDR_Presentation.ppt**

Gist of answers (about 5% of the whole answer) should be boldfaced, *italicized*, highlighted, tabularized, or otherwise denoted in importance.

Lengthy submissions should be accompanied by a **Summary**, in addition to work pages. All submissions are due before class on the day indicated.

Systems Engineering Magazines

Grading Scale
The grading scale is approximately.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>&gt;90%</td>
<td>A</td>
</tr>
<tr>
<td>&gt;80%</td>
<td>B</td>
</tr>
<tr>
<td>&gt;70%</td>
<td>C</td>
</tr>
<tr>
<td>&lt;70%</td>
<td>F</td>
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However, because of the need to differentiate student performance, the class will be graded “on a curve.” About half the students will receive an A, and about half will receive a B.

(Employers and schools need grade differentiation – not grade inflation.)

My goal is to get everyone to perform at an A or B level.

However, C and F performance will be assigned a C or F grade.

If you submit an assignment late, you are almost instantly classifying yourself as a C student.

**NO LATE HW, ASSIGNMENTS, OR TESTS WILL BE GRADED.**

Late submissions will be accepted for ‘check off” only.

Failure to submit any of the required assignments by the course end will qualify the student for no better than a C grade.

Late submissions must be accompanied by an independent research paper and class presentation.

Collaboration is allowed for the homework and group projects.

Collective work should be publicly acknowledged as such.

Material copied without proper reference will be considered incorrect.

Pictures must either be referenced or the original picture-generating file must be attached.

*Highlight the core of your answers*; failure to do so will result in a discount of credit.

Word documents are preferred to .pdf for markability.

Scanned pages can be difficult to read, clog email, and need printing.

**Academic Dishonesty**

Student Academic Handbook describes the student standard of conduct, and offers descriptions of academic dishonesty including cheating or plagiarism.

**CHEATING ON EXAMS WILL BE DEALT WITH SEVERELY.**

Cheating is a *strict liability* offense to the Department, the University and Society, and, as such, must be dealt with when detected. Cheating, when the objective assessment of an exam is required, is also an offense of dishonesty to oneself.

Cheating carries a mandatory sentence of a C grade, and worse consequences are available.

Past experiences show that cheating is unfortunate to all involved.