MEC 525 - ESE 542
Product Design, Concept Development and Optimization
COURSE OUTLINE
Fall 2007

Instructor:  J. Rastegar
Office: H.E. 214 C (2-8314)
Office Hours: M 3:30-6:30 pm or appointment
Lectures: M 6:50-9:40 pm – Harrmn 115

Text:  *Engineering Optimization - Methods and Applications*, By


The following topics will be covered:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Text</th>
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<tbody>
<tr>
<td>1 Introduction (1 week)</td>
<td>Chap. 1-11 (reference)</td>
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<tr>
<td>2 The Total Design Approach (4 week)</td>
<td>Chap. 1</td>
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<td>3 Introduction to Optimization (1/2 week)</td>
<td>Chap. 2</td>
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<td>4 Functions of a Single Variable (1 1/2 weeks)</td>
<td>Chap. 3</td>
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1st Midterm

5 Functions of Several Variables (1 weeks) | Chap. 4 |
| 6 Introduction to Linear Programming (1 weeks) |

2nd Midterm

7 Constrained Optimality Criteria (1 weeks) | Chap. 5 |
| 8 Transformation Methods (1/2 week) | Chap. 6 |
| 9 Constrained Direct Search (1 weeks) | Chap. 7 |
| 10 Direction-Generation Methods Based on Linearization (1/2 week) | Chap. 9 |

The remaining 2 weeks of the course consists of lectures on mathematical modeling and simulation techniques and discussion and presentation of the student projects.

If you do not already have a computer account, make sure to get one as soon as possible and prepare yourself to write programs for numerical methods and optimization using one of the programming languages.
During the semester, each student will select a design project. A short proposal, detailing the work to be done and the expected results is due in the third class. The topic of the proposal has to be approved by the instructor. A final report is due on the last day of classes. During the semester, several students will be asked to present their project and the progress that has been made as examples of "design reviews". A final and formal oral presentation will be scheduled during the last week of classes.

**GRADING**

1. Homework (20 points).

2. Two midterms (15 points each).

3. Final exam (40 points).

4. Project (proposal, presentation and final report) - (10 points).
   (project proposal will be counted as a HW)