Instructor: Dr. Mehmet Bayram Yildirim  
E-mail: my Sabanci Email OR Bayram.yildirim@outlook.com

Office Hours: To be announced.

Catalog Description: Economic comparison of engineering alternatives considering the time value of money, taxes, and depreciation; accounting and its relationship to economic analysis; replacement decisions.

Course description: Economic evaluation of engineering alternatives and design, time value of money and economic impact of taxes, risk and depreciation. Topics will include time value of money, equivalence, economic decision-making, capital budgeting, replacement analysis, and depreciation, impact of taxes, sensitivity analysis, break-even analysis, and public work analysis. Assignments and problem solving will emphasize Aerospace engineering applications.

Course Objectives:  
1. Understand and apply fundamental engineering economy concepts and use the terminology of engineering economics  
2. Use engineering economy factors to account for the time value of money  
3. Use multiple factors to find equivalent amounts for cash flows that have nonstandard placement  
4. Make computations for interest rates and cash flows that are on a time basis other than a year  
5. Utilize present worth, annual worth, capitalized cost analysis to evaluate and select alternatives and applications in engineering  
6. Use the concept of rate of return and perform rate of return analysis of a single alternative and incremental analysis for multiple alternatives.
7. Understand public sector projects and select the best alternative on the basis of incremental benefit/cost analysis  
8. Perform a replacement/retention study between an in-place asset, process or system and one that could replace it  
9. Determine the breakeven for one or two alternatives and calculate the payback period with and without a rate of return  
10. Consider the effects of inflation when performing an engineering economy evaluation  
11. Use depreciation or depletion methods to reduce the book value of a capital investment in an asset and natural resource  
12. Perform an after tax economic evaluation considering the impact of pertinent tax regulations, income taxes, and depreciation


You must have your textbook and a calculator (scientific or financial) during every class.

Online Learning Center: http://www.mhhe.com/engcs/industrial/blank/. You should study the online quizzes available on this website.

PRE-REQUISITE: Calculus I or equivalent.

Homework quizzes: Homework assignments will be made but will not be collected and graded. You are strongly advised to study the homework problems to ensure that you understand the analysis procedures to be successful in the quiz which you will have in the last 15 minutes of the recitation. Note that there may be unannounced quizzes on Mondays or Tuesdays especially when the attendance level is low.

Tests: Two tests and a final will be administered.

Please note that: There will be no make-ups for the quizzes and exams. Any absences from the exams must be arranged with the instructor before the absences. Absences not so arranged will result in grades of zero.
Grading:

<table>
<thead>
<tr>
<th>Grading</th>
<th>Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Two exams</td>
<td>25% each</td>
</tr>
<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Request for reconsideration of grading on exams/quizzes: If you think your exam (or any quiz) was graded unfairly, then you must send me an email explicitly articulating your rationale for additional points. This is used to force you to do it in writing. **You must email me within one day of when exam/quiz is returned.** Then you must bring the exam to my office and I will render a decision. Do NOT expect to discuss it with me in my office.

Academic Honesty:

You are expected to abide by the following:

“Students who compromise the integrity of the classroom are subject to disciplinary action on the part of the University. Violations of classroom standard include:

1. Cheating in any form, whether in formal examinations or elsewhere
2. Plagiarism, using the work of others as your own without assigning proper credit to the source
3. Misrepresentation of any work done in the classroom or in preparation for class
4. Falsification, forgery, or alteration of any documents pertaining to academic records
5. Disruptive behavior in a course of study or abusiveness toward faculty or fellow students.”

**TOPIC OUTLINE**

I. How it all starts (Chapters 1-4)
   A. Foundations of Engineering Economy
   B. Factors: How Time and Interest Affect Money
   C. Combining Factors and Spreadsheet Functions
   D. Nominal and Effective Interest Rates

Exam I

II. TOOLS FOR EVALUATING ALTERNATIVES (Chapters 5, 6, 7, 8 and 9)
   A. Present/Future Worth Analysis
   B. Annual Worth Analysis
   C. Rate of Return Analysis (Single and Multiple Alternatives)
   D. Benefit/Cost Analysis and Public Sector Economics

Exam II

III. MAKING DECISIONS ON REAL WORLD PROJECTS (Chapter 11, 13, 14, 16, and 17)
   A. Depreciation Methods
   B. After-Tax Economic Analysis
   C. Effect of Inflation
   D. Replacement and Retention Analysis
   E. Breakeven Analysis

Exam III- FINAL