Syllabus: IEMS 326
Economics and Finance for Engineers
Winter 2011

Time: Mondays, Wednesdays, and Fridays, 3:00-3:50.
Midterm Exams: Wednesdays 4/13 and 5/4, in class.
Final Exam: Wednesday, June 8, 12-2pm.
Place: Frances Searle 2-407 (for class meetings and exams)

Professor: Benjamin Armbruster
Office: Tech M237
Office Hours: Mondays, 4:00-5:00

Teaching Assistants: Dongjae Lim and Kibaek Kim
Email: dongjae@u.northwestern.edu and kibaek.kim@u.northwestern
     (please direct emails to the TAs)
Office Hours: Mondays and Tuesdays 5:00-6:00 in Tech C135 (computer lab)

Required Textbook: We will be using a custom textbook ordered through the University bookstore. It contains selections from two books published by Oxford University Press:
- *Investment Science* by David G. Luenberger.
- *Engineering Economic Analysis,* 10th ed., by Donald G. Newnan, Jerome P. Lavelle, and Ted G. Eschenbach.

Course Purposes:
- Train engineers to
    - be conversant with their corporate financial environment
    - participate in the design of engineering projects that are financially advantageous
    - justify project proposals to management
- Teach tools useful for internal or external consultants advising on
    - project selection
    - company valuation
- Prepare students to take Financial Engineering I (IEMS 373).
- Teach uses of IEMS tools in business.

Course Objectives: You should be able to
- Discuss the basics of bonds and stocks and their valuation.
- Compute net present value and other project valuation criteria, and use them in project valuation and selection.
- Use the capital asset pricing model and apply it to computing weighted average cost of capital in project valuation and selection.
- Use decision trees in project valuation and selection.

General Policies:
- Please check the course website daily for announcements and postings.
- All exams are closed-book, closed-notes. The exam paper will include an information sheet to reduce the need for memorization. All exams are cumulative but the midterms will emphasize the material not covered on any previous exam.
- Numerical course grades will be based on the following components:

Homework	20%
Midterm Exams	40% total
Final Exam	40%

Homework Policies:
- You may prepare joint homework submissions in groups of size one or two. If you work in a group, please work together on the entire assignment; do not split it up into parts that you do separately, as this will result in reduced learning and reduced exam scores.
- Students may discuss the homework with each other, but groups must prepare their submissions independently. If you need help with assignments, please come to office hours. Preparing submissions independently means:
  - Do not sit down with another group and work out the solution to a problem together.
  - Do not collaborate on the preparation of a spreadsheet used in more than one group's submission.
  - Do not copy or make use of another group's solutions or spreadsheets, and do not allow another group to copy or make use of yours.
- There will be eight homeworks: six regular homeworks and two case studies. Your lowest score out of the eight homeworks will be dropped. You need only do seven of the homeworks. Contact the instructor only if there are multiple homeworks you will not be able to submit on time.
- Submit homework at the beginning or end of class; pick up graded items from the TA in office hours.
- Bring late homeworks to me in my office; leave them under the office door if I am not there. Do *not* put homework in my mailbox or the TA's mailbox, because we might not find it before solutions are posted. Late homeworks can not be accepted after solutions have been posted, so please contact me if you are going to be slightly late with the homework.
- Regular homeworks will be graded by rating each question *check* (correct or nearly correct), *check-minus* (substantial errors or lack of clarity), or *no credit* (little work done, barely comprehensible, or other severe deficiency). Please read the solutions closely each week, even if your homework received a good score, to see if your answer matches the solution and what was the source of any error. This is an important part of the learning process. See the TA in office hours if you have trouble figuring out what went wrong.
- Regular homeworks should not be submitted electronically except for spreadsheets or with the instructor's prior permission (e.g., unavoidable travel).
- Show your work except when the assignment states otherwise.

- Spreadsheets should be submitted by email to the TA. The body of the email should be empty, the subject line should mention the assignment number, and the name of the attached Excel file should be *Lastname_Firstname*.
- Please make your <u>charts beautiful</u>. Text should be <u>legible</u>. Axes should be <u>labeled</u>. Appropriate <u>units</u> and precision should be used. A <u>caption</u> explaining the figure should be provided. See magazines such as *Science* for examples.
- Please make your <u>spreadsheets easy to understand</u>. Make the spreadsheet self-contained by labeling and explaining things. Use formatting to make things easier to understand and to highlight the conclusions. Please do not hide columns or rows because the point of the spreadsheets is to explain. Use appropriate precision and formatting for the data (e.g., avoid scientific notation for cells displaying millions of dollars).
- Think of your <u>response to the case</u> as a well-written lab report that counts as a full homework but you have more time to complete. I would like you to submit a hard copy of the response and separately submit via email a spreadsheet that explains your calculations. Our grading will focus on the written response, we might not look at the spreadsheet. The written response should be 2-3 pages total, which I suggest you break up into 1-1.5 pages of text followed by tables and/or charts. We suggest the following section headings: I. Problem & Objective, II. Methods and Assumptions, III. Results and Conclusions, and IV. Tables & Figures.