



**Subject: Engineering Economics**

**Number: 504**

**Course Title: Advanced Process Engineering Economics**

**Section: EBG504A**

**Semester/Year: Spring 2018**

**Instructor: Andrew H. Pederson**

**Contact Information:**

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**Office hours:**

Monday: 9:00-12:00 and 1:00-3:00  
Tuesday: 9:00-12:00  
Wednesday: 9:00-12:00 and 1:00-3:00  
Thursday: 9:00-12:00  
Friday: by appointment only

**Class meeting days/times:**

EBG504; Tuesday/Thursday 12:30 – 1:45 pm

**Class meeting location:**

504; Berthoud Hall 243

**Web Page/Canvas link:** <http://www.Canvas.mines.edu>

**Teaching Assistant / Grader:**

To be determined  
Graders will not be holding office hours.

**Instructional activity:** 3 hours lecture      hours lab 3 semester hours

**Course designation:**      Common Core      Distributed Science or Engineering  
X Major requirement X Elective      Other

**Course description from Bulletin:**

This course introduces students to the concepts of time value of money. Concepts are then applied to a variety of banking and investment scenarios. Development of related decision criteria including rate of return, net present value, ratios, discount rates and breakeven concepts are applied to both before-tax and after-tax economic analyses of mineral, petroleum, alternative energy and non-resource investments. Related topics include; (1) proper application of criteria in both mutually exclusive and non-mutually exclusive environments for both income and service scenarios, (2) measured impact of inflation in cash flows and interest rates, (3) risk adjusting a model using expected value, (4) after-tax analysis will explore a variety of tax deductions and impact on taxes, after-tax cash flow and project economics, (5) proper

applications in an after-tax environment. A small group project applying many of the course concepts will be completed as well. These concepts are developed using a combination of lecture and reading material.

**Textbook and/or other required materials:** (copies are available in the library and on reserve)

- Economic Evaluation and Investment Decision Methods, 15<sup>th</sup> Ed, 2017 by Stermole, Stermole, & Pederson, Investment Evaluations Corporation.

**Recommended Textbook:** (copies are available in the library and on reserve)

- Self-Teaching Manual (STM) for Economic Evaluation and Investment Decision Methods, 15<sup>th</sup> Ed, 2017, by Stermole, Stermole, & Pederson, Investment Evaluations Corporation.
- STM is also available in Spanish; see A. Pederson

**Student learning outcomes: At the conclusion of the class students will...**

- Better understand and manage their personal financial considerations
- Properly evaluate the economics of corporate investment opportunities
- Understand project economic sensitivity to various parameters such as inflation, risk, and taxes
- Convey to others the meaning of their findings
- Be prepared for the concepts related to time value of money and cash flow on the FE Exam

**Brief list of topics covered:**

- Introduction to mathematical and practical concepts of time value of money (TVM)
- Application of TVM concepts to development of decision criteria used to evaluate investments in the natural resource and non-resource industries
- Proper application of decision criteria to different investment situations
- Inflation implications to cash flow and decision criteria in economic modeling
- Introduction to sensitivity & risk analysis techniques emphasizing expected value
- After-tax cash flow for a variety of investors in industries including the natural resource and non-resource and the economic impact of various financial conditions
- Proper application and meaning of decision criteria in an after-tax environment
- Investment applications including understanding concepts and terminology related to bonds, equities, options in equities and commodity futures contracts

**Policy on academic integrity/misconduct:**

The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is [online](#).

## Grading Procedures:

This class will use a points grading system. All possible points will be outlined on the detailed test outline posted on Canvas. Homework will typically be worth 10, 15, or 20 points but assignments are subject to change so all stated values should be considered as best guesses. The three tests have points outlined in the "Exam Policy" of this syllabus. After material has been graded the points will be posted in Canvas where the student may view their total points. Each homework, quiz, and test will have marks where the student lost points so the student can learn from their mistakes.

## Course Homework Return Policy:

Course material, including homework and tests, will be returned during class. Homework will be returned the following class period whenever possible, while tests will be returned no later than two weeks after the test date. It is the student's responsibility to retrieve all homework and tests. All course material not retrieved by the end of the semester will be shredded.

## Absence Policy:

There is no makeup, bonus work, or replacement exams. The only exception to this policy is an absence approved by letter from the Dean of Students or the Department of Athletics. If you know you will be gone on a specific date, it is your responsibility to make alternative plans. I am happy to work with you if you plan ahead and of course, in true emergencies.

## Exam Policy:

**Students will be required to show picture ID upon turning in an exam.** All exams will be open textbook only, no self-teaching manuals are allowed. Your exam must be stapled to your work for any possibility of credit. Please note: no bags or laptops will be allowed at your seat during an exam. Baseball hats and other similar headgear that shields a student's face are not allowed.

Exam #1	Chapters 1-3	February 8 <sup>th</sup>	100 Pts
Exam #2	Chapters 3-6	March 8 <sup>th</sup>	125 Pts
Exam #3	Chapters 7-11	April 26 <sup>th</sup>	150 Pts
Total Exams			375 Pts

## Homework:

- Homework must be turned in the day it is due to be graded – plan ahead.
- Homework must have a full student name and section i.e. "John Smith EBG321A"
- No homework will be accepted if it is turned in late; no make-up homework will be assigned for missed homework.
- It is the student's responsibility to make arrangements if the student is going to be away when homework is due.
- Homework points will be outlined on the detailed test outlines posted on Canvas

Initial Investment Game Report	20 Pts
Intermediate Investment Game Report	30 Pts
Final Investment Game Report	100 Pts
Homework/Quizzes (Approximate Total)	215 Pts
Total Tests	375 Pts
Final Project	100 Pts
Group Article Review	50 Pts
Approximate Total	890 Pts

Based on an estimated 890 points, exams represent 42% of the total grade, so participation in all phases of the course is necessary to succeed! Points determine grades, which are based on a typical plus minus grading scale. There is no makeup, bonus work, or replacement exams. The only exception to this policy is an absence approved by letter from the Dean of Students or the Department of Athletics. If you know you will be gone on a specific date, it is your responsibility to make alternative plans. We are happy to work with you if you plan ahead and of course, in true emergencies.

**All lecture notes, detailed course outlines and related materials such as office hours, this syllabus, etc, will be on Canvas**

Along with exam reading and homework assignments, all homework, quiz and exam solutions will be posted on Canvas. Posting of solutions will occur immediately after the Section B class period representing the final lecture in each series. No homework will be accepted after the solutions have been posted. See individual exam outlines for details on assignments.

**Course Schedule:**

Each exam will have its own detailed course schedule that will be available on Canvas. Below is an approximate general course outline.

January	Text chapters 1, 2 & 3; time value of money & decision criteria
February	Text chapters 4, 5 & 6; application of criteria, inflation, sensitivity & risk
March	Text chapters 7 & 8; after-tax cash flow and analysis of projects
April	Text chapters 9, 10 & 11; after-tax applications, replacement, borrowed money

**Disability Support**

The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you are registered with Disability Support Services (DSS) and I have received your letter of accommodations, please contact me at your earliest convenience so we can discuss your needs in this course. For questions or other inquiries regarding disabilities, I encourage you to visit [disabilities.mines.edu](http://disabilities.mines.edu) for more information.

**Disclosure**

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