# BSEN 206 – Engineering Economics

(Online)

## Instructor

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## About this Course

This course is an online version of BSEN 206 - Engineering Economics. It is intended as an introductory course in economic decision making for engineers and scientists. For students taking this course, it is not expected that you have previous background in economics, accounting, or finance. However, prior mathematical background up to and including college algebra and trigonometry is recommended. An in-class lecture version of this course is also taught at the University of Nebraska - Lincoln during both fall and spring semesters.

## Catalog Description

Introduction to methods of economic comparisons of engineering alternatives: time value of money, depreciation, taxes, concepts of accounting, and activity-based costing.

## Prerequisite

Sophomore standing - this course is not intended for students just starting their engineering education.

## Course Objectives

After successfully completing this course, students should be able to (ABET Outcome):

- Solve a variety of economic problems using the general engineering problem solving process. (2)
- Describe the basic concepts of cost and apply cost accounting methods to economic analysis. (2)
- Describe the time-value of money and be able to calculate economic equivalence for different economic alternatives. (2,4)
- Use appropriate qualitative and quantitative methods for comparing investment alternatives. (2,4)
- Demonstrate techniques for incorporating depreciation and income tax into economic analysis. (2,4)
- Use cost-benefit analyses to rank engineering projects. (2)
- Demonstrate an ability to explain ethical principles, civics and stewardship, and their importance to society. (4)

## Course Hours and Credit

This course is a 3-credit hour 8-week course in the summer and full-semester course in the fall and spring.

## Recorded Lessons

***You must be highly motivated as this is an online course with minimal direct teaching instruction.***

Each module will have 3 to 5 lessons. Each lesson is designed to be used *in conjunction* with the textbook. Relying solely on the recorded lessons may not be sufficient to learn the material just as only reading the textbook will not provide you with all the material for the assessments. Therefore, it is suggested that you read the text *in addition* to the recorded lessons.

## Homework Problems

- The course will be broken into six modules of roughly three chapters each. Each module will be covered in approximately two weeks.
- Practice problems will be given for each chapter in six blocks in addition to one Ethics homework in the first module. *Completed homework will not be submitted nor graded*. However, it will be extremely helpful for you to complete the problems to prepare for the exams.
- Some homework problems from chapters 8, 12, and 13 may require a spreadsheet to solve and are marked accordingly with an asterisk (*). On an exam, you will not be allowed the use of a spreadsheet for mass calculations, but you will be expected to do single calculations within a spreadsheet data set.

## Exams

- There will be an exam at the end of each module and one *cumulative* final exam. In addition to the economics calculations problems, there will be two or three ethics questions on each exam.
- For each exam you must report to an approved testing center to take the proctored exam at the specified time. On UNL's campus, the Digital Learning Center Exam Commons is located in North Love Library. You must register for a time ahead of the test day. https://its.unl.edu/dlc/students/
- If you are remote and unable to be on UNL campus, please follow these instructions to ensure you are taking the exams with an approved proctor. https://online.unl.edu/faculty/proctoring-exams/agreement. Questions about proctoring and remote exams should be directed to the DLC.
- You may also take the exams through ProctorU online program, but you will be responsible for the additional fee.
- You may use a calculator, but the exams will be *closed book and closed notes*. An equation sheet and a packet of compounding interest tables will be provided to you for the exams. **Exams will be multiple choice with partial credit for a missed answer if appropriate work is neatly shown**. Take the time to enter work that demonstrates your understanding of the material to receive the partial credit. *Do not leave an answer blank! Anything is better than nothing.*

## Exam and Homework Solutions

Homework solutions will be posted prior to exam date. The best approach is to attempt the practice problems prior to knowing the solution. Once you've attempted the problems, then compare and learn from mistakes (if any). Exam solutions will be posted the day after the exam deadline.

## Academic Integrity

"Students are expected to adhere to guidelines concerning academic dishonesty outlined in Section 4.2 of the University's Student Code of Conduct (http://stuafs.unl.edu/ja/code/). The BSE Department process for grade and academic dishonesty appeals can be found at http://bse.unl.edu/academicadvising-index. Students are encouraged to contact the instructor for clarification of these guidelines if they have questions or concerns."

## Final Grades

The following percentages will be used as calculating the final grade:

- Exams – 6 x 13% = 78 %
- Final Exam = 22%

The grading scale for this course will be based on the following scale. (Note that the scale is shifted down already, so there will be no additional scaling, bonus points, or extra credit at the end of the course to bump any individual's final grade.)

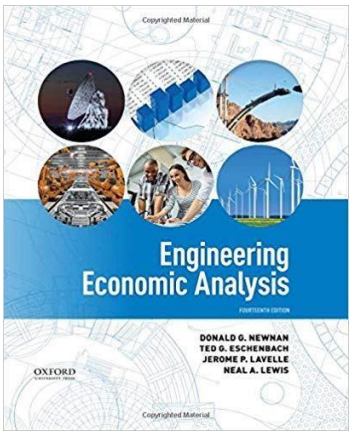
- A: 92% or above
- A-: 89%-92%
- B+: 86%-89%
- B: 82%-86%
- B-: 79%-82%
- C+: 76%-79%
- C: 72%-76%
- C-: 69%-72%
- D: 60%-69%

Please note that although Canvas will provide you with a total score for the points allocated in the course, this score has not been weighted by the scale given above and may not reflect your up-to-date grade in the course.

## TextBook

The textbook is ***required*** as homework problems will be assigned from the book. The book is available at the UNL bookstore but you may obtain the book from any source or site, new or used.

| | |
|---|---|
| Title | Engineering Economic Analysis (**14th Edition**) |
| Author | Donald G. Newnan; Jerome P. Lavelle; Ted G. Eschenbach |
| ISBN | 9780190931919 |
| Publisher | Oxford University Press, Incorporated |
| Publication Date | 2019 |
| Binding | Trade Cloth |
| Type | Print |
| Price | ~$75.00 |



# Schedule and HW assignments

| Module | Exam Due Date | | Topic | Video | Length | Text Chapter | HW Problems (*computer recommended) |
|---|---|---|---|---|---|---|---|
| | | | Introduction | 0-1 | | | |
| 1 | Wednesday | 2-Feb-22 | Ethics | 1-1 | 28:57 | 1 & FE Ethics | Supplemental Problems |
| | | | Costs | 1-2 | 36:47 | 2 | 2-5, 2-14(e), 2-15(b) |
| | | | Interest & Compounding | 1-3 | 40:22 | 3 | 3-3, 3-19(c), 3-20(c), 3-21(c), 3-40, 3-42 |
| 2 | Friday | 18-Feb-22 | Uniform Payments | 2-1 | 34:21 | 4 | 4-3, 4-5, 4-11, 4-16(a-c), 4-53(a-c), 4-64, 4-77(a-b) |
| | | | Gradient Payments, Continuous Compounding, Spreadsheets | 2-2 | 28:57 | | |
| | | | Present Worth / Annual Cashflow | 2-3 | 41:19 | 5 | 5-11, 5-12, 5-17, 5-20, 5-44(a), 5-47, 5-73, 5-92, 5-95 |
| | | | Loans | 2-4 | 14:46 | 6 | 6-2, 6-20, 6-47 |
| | | | Bonds | 2-5 | 12:08 | | |
| 3 | Monday | 7-Mar-22 | Rate of Return | 3-1 | 29:05 | 7 | 7-8, 7-12, 7-75 (use ΔRoR) |
| | | | Modified Internal RoR | 3-2 | 8:38 | | |
| | | | Selecting Alternatives | 3-3 | 22:32 | 8 | 8-15(b)*, 8-23(b)* |
| | | | Other analysis Techniques | 3-4 | 38:07 | 9 | 9-33, 9-50(a-c), 9-55(a-d) |
| 4 | Wednesday | 30-Mar-22 | Uncertainty | 4-1 | 41:20 | 10 | 10-8, 10-20, 10-31(a-b), 10-41 |
| | | | Depreciation | 4-2 | 31:22 | 11 | 11-13(3yrpropclass),11-18,11-20, 11-45,11-59 |
| | | | Corporate Income Taxes | 4-3 | 27:09 | 12 | 12-5,12-22*,12-33*,12-35*,12-65*,12-A2,12-A3 |
| | | | Personal Income Taxes | 4-4 | 19:46 | | |
| 5 | Friday | 15-Apr-22 | Economic Life | 5-1 | 23:21 | 13 | 13-3*,13-4*,13-30,13-35*,13-37*,13-38 |
| | | | Replacement | 5-2 | 19:18 | | |
| | | | Inflation | 5-3 | 34:40 | 14 | 14-9,14-11,14-17,14-23,14-28,14-31,14-61e |
| 6 | Friday | 29-Apr-22 | Minimum Acceptable RoR | 6-1 | 25:50 | 15 | 15-4,15-8,15-20 |
| | | | Public Sector | 6-2 | 22:03 | 16 | 16-14,16-29 |
| | | | Accounting | 6-3 | 18:26 | 17 | 17-11, 17-23 |
| Final | Monday - Thursday | May 9 to 12 | | | | | |

**Instructor Bio:**

# Curt Tomasevicz

***"It's not the size of the dog in the fight. It's the size of the fight in the dog" - Bear Bryant***

## Eduction:

- B.S. in Electrical Engineering from University of Nebraska-Lincoln (2003) w/ a minor in Astrophysics
- M.S. in Electrical Engineering from University of Nebraska-Lincoln (2006)
- Ph.D. in Biological Systems Engineering from University of Nebraska-Lincoln (2017)

## Key points and interesting facts:

- Holds position of Director of Sport Performance for USA Bobsled and Skeleton
- Doctoral dissertation was on power output of different vertical jumping maneuvers.
- Master's thesis was on distributed generation and alternative power
- Authored several papers on human performance metrics and athletic biomechanics
- Owns a patent on a hip harness used for FAI hip impingements
- Co-authored three papers on power system maintenance
- Spent 10 years on the U.S. National Bobsled Team including 3 Olympics ('06, '10, '14)
- Won 2 Olympic medals (gold in 2010 and silver in 2014)
- Grew up in Shelby, NE (pop. 720)
- Plays bass guitar in a rock band "22 Days Short"
- Favorite music bands are Pearl Jam, Candlebox, and Third Eye Blind
- Favorite sports teams are the Chicago Cubs, Pittsburgh Penguins, and Philadelphia Eagles