

**National University**

**School of Engineering & Computing**

Derek Podobas

Derek.Podobas@nat.univ.edu

Instructor:

**Course Outline**

**Course Title and Code:** Engineering Economics, EGR 310

**Course Prerequisites:** Satisfactory completion of MTH 215

**Course Textbook:** Engineering Economic Analysis, **14th Edition**, Donald G. Newman, Ted G. Eschenbach., Jerome P. Lavelle, Neal A. Lewis, Oxford University Press, 2020. ISBN-13: 978-0190931919

**COURSE DESCRIPTION:**

Economic analysis for decision making with emphasis on rate of return, net present value, benefit-cost and multi-objective evaluation methods, cost estimation, and alternative analysis.

**LEARNING OUTCOMES:**

Upon successful completion of this course, students will be able to:

* Understand major principles of economic analysis for decision making among alternative courses of action in engineering.
* Apply cost estimation and alternative analysis techniques for engineering applications.
* Demonstrate knowledge of cost estimation techniques and probabilistic risk analysis.
* Understand techniques and methods of sensitivity analysis and expected-value decisions.

**COURSE REQUIREMENTS:**

This course is designed to teach the fundamental concepts of engineering economics to engineers. By limiting the intended audience to engineers it is possible to provide an expanded presentation of engineering economic analysis and do it more concisely than if this course were written for a wider audience. Rational decision making uses a logical method of analysis to select the best alternative from among the feasible alternatives.

In addition to successfully achieving the learning outcomes, students are expected to participate in all class activities, complete exams as scheduled, and turn in all assignments on time. Failure to do so may result in the loss of points or the lowering of one's grade.

**Reading Schedule**

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| **Week 1** | |  |
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| Chapter 1 | | Making Economic Decisions |
| Chapter 2 | | Estimating Engineering Costs and Benefits |
| Chapter 3 | | Interest and Equivalence |
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| **Activities** |  | Participate in threaded discussion questions for Week 1 |
|  | | Complete Homework Week 1 |
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| **Week 2** | |  |
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| Chapter 4 | | Equivalence for Repeated Cash Flow |
| Chapter 5 | | Present Worth Analysis |
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| **Activities** | | Complete the discussion questions for Week 2 |
|  | | Complete Homework Week 2 |
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| **Week 3** | |  |
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| Chapter 7 | | Rate of Return Analysis |
| Chapter 8 | | Choosing the Best Alternative |
| Chapter 10 | | Uncertainty in Future Events |
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| **Activities** | | Complete discussion questions for Week 3 |
|  | | Complete Homework Week 3 |
|  | | Complete Midterm Exam |
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| **Week 4** | |  |
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| Chapter 11 | | Depreciation |
| Chapter 12 | | Income Taxes for Corporations |
| Chapter 13 | | Replacement Analysis |
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| **Activities** | | Complete discussion questions for Week 4 |
|  | | Complete Homework Week 4 |
|  | | Complete Final Exam |
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**COURSE GRADING:**

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| Threaded Discussion Weeks 1 – 4 (25 points each) | 100 |
| Homework Weeks 1 – 4 (100 points each) | 400 |
| Midterm Exam | 200 |
| Final Exam | 300 |
| **Total Points** | **1000** |

**GRADES AND GRADING SYSTEM:**

A = 95-100%, A- = 90-94%, B+ = 87-89%, B = 84-86%,

B- = 80-83%, C+ = 77-79%, C = 74-76%, C- = 70-73%, D+ = 67-69%

D = 64%-66%, D- = 60-63%, F = < 60%

Grades that are in-between will be rounded up/down to the nearest whole number. For example, 94.4 and below will become 94%, while 94.5 and above will round up to 95%.

## Definition of Grades:

**An** Outstanding Achievement

**B** Commendable Achievement

**C** Marginal Achievement

**D** Unsatisfactory \*

**F** Failing \*

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| \* Student receiving this grade in a course that is required for his/her degree program must repeat the course. |

**I: Incomplete:** A grade given at the discretion of the instructor when a student who has completed **at least two-thirds of the course class sessions** and is unable to complete the requirements of the course because of *uncontrollable* and *unforeseen* circumstances. The student must convey these circumstances (preferably in writing) to the instructor prior to the final day of the course. If an instructor decides that an “Incomplete” is warranted, the instructor must convey the conditions for removal of the “Incomplete” to the student in writing. A copy must also be placed on file with the Office of the Registrar until the “Incomplete” is removed or the time limit for removal has passed. An “Incomplete” is not assigned when the only way the student could make up the work would be to attend a major portion of the class when next offered.

An “I” that is not removed within the stipulated time becomes an “F.” No grade points are assigned. The “F” is calculated in the grade point average.

W: Withdrawal: **Signifies that a student has withdrawn from a course after beginning the third class session.** Students who wish to withdraw must notify their admissions advisor before the beginning of the sixth class session in the case of graduate courses. **Instructors are not authorized to issue a “W” grade.**

**Threaded Discussion (25 points per week; 100 points total)**

The educational goal of threaded discussions is to give students an opportunity to reflect on the textbook material and the class discussions and synthesize this knowledge into understanding of the weekly course learning objectives.

The threaded discussion assignments will be graded based on **Quality of Information** and **Delivery of Information**. At minimum, students must answer one threaded discussion question and respond to at least other student’s answer. To get the maximum number of points, all threaded discussion should be answered or responded to, in detail, as described in the high-performance section of the table below. Your first post to the discussion board each week should be **completed by midnight Thursday Pacific Time**. Then you have until **midnight Sunday Pacific Time** to respond to each other.

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| **Threaded Discussion**  **(On a scale of 0-10)** | **Quality of Information** | **Delivery of Information** |
| <10 points =  Low performance | Response is not related to the assignment; irrelevant remarks are made; response did not answer all questions. | Poor spelling and grammar, "hasty" appearance, professional vocabulary not used, and attitude negative or indifferent. |
| 10-20 points =  Moderate performance | Response is related to topic; supporting details or examples are not included in sufficient breadth or depth; the author simply restates concepts made by others (textbook, instructor). | Few grammatical or spelling errors, professional vocabulary used most of the time, and positive attitude displayed frequently. |
| 21- 25 points =  High performance | Supporting details and examples are both broad and deep; the author shows originality and does not restate the textbook or instructor; all questions are answered. | Consistent grammatically correct posts with professional vocabulary, no misspellings, and positive attitude displayed throughout. |

**Homework (100 points per week; 400 points total)**

The educational goal of homework is to check understanding of the textbook reading material.

## Midterm (200 points) & Final Exams (300 points)

The educational goal of the midterm and final exams is to check understanding and synthesis of textbook reading material with classroom discussions and overall progress towards mastery of the Course Learning Objectives.

The midterm exam is worth 200 points and final exam is worth 200 points The exam will be open note, open book, and taken on-line through the course website.

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## National University Policies and Procedures

See our website for all the academic policies and procedures:

<http://www.nu.edu/OurPrograms/StudentServices/AcademicPoliciesandP.html>