

## The ESC 282 Section 50 – Engineering Economy – Spring 2021

### Cleveland State University, Washkewicz College of Engineering

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**Objective:** Engineering Economy discusses the behavior of individuals and businesses with respect to society and government. It studies the cultural and regulatory environment in which these entities exist, and explains the motivation and rationale used by these entities in their decision-making processes. Further, Engineering Economy discusses how financial decisions made in this environment can affect these entities and alter the environment in which they operate. Students taking Engineering Economy will understand criteria for decision-making beyond the technical merit of a project.

**Catalog Data:** Course focuses on the coupling of technical analysis and economic feasibility to determine the best course of action among alternatives competing for scarce resources in both public and private sector projects. Studies the principles, concepts, and methodology of the time value of money as applied to governmental, industrial, and personal economic decisions. Topics include benefit-cost analysis, inflation, depreciation, taxes, tax abatements, risk and sensitivity analysis, and the comparison of alternatives.

**Course Text (required):** *Engineering Economy* (Loose Page Custom Hard Copy from CSU Bookstore with CODE Package) Edition: 17<sup>th</sup> by Sullivan, Wicks, and Koelling. ISBN: 9780135222751

**Office Hours:** M-W 4:30-5:45 PM Eastern Time USA -Zoom Meeting to ask Questions and Learn the concepts, theories well and their applications in solving economical engineering problems and make Financial decisions.

#### Outcomes:

4- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

Upon completion of this course the students should understand and be able to apply the following concepts in their professional practice and personal lives:

- principles of engineering economy, including time-money relationships;
- a basis for development, comparison, and selection of economic alternatives;
- depreciation methodologies, and;
- the Cost-Benefit-Ratio methodology.

**Homework Policy:** Homework and project assignments are due on M-W at 3:00 pm. Late submittal of homework or assignments will be penalized by 20% deduction per day. The Homework assignment will have 2 parts: Part 1 of the homework assignments will be completed on MyEngineeringLab WEB SITE accessed by using the Pearson Code and it is the student responsibility to complete them on or before the due date. Part 2 is to have the HANDWRITTEN answers to the same questions solved in part 1 but showing all steps, calculations, equations, tables and graphs/plots to be submitted on Blackboard on or before the due date. Hence it is advisable to Listen to all Power Points Lectures, read the examples in the book, attend all Zoom meetings in order to be able to complete the Homework assignments CORRECTLY.

## GRADING POLICY FOR ESC 282

**Grade Determination:** Your performance will be evaluated in the following areas with their relative importance listed in percentage terms:

A	$\geq 95$	
A-	$\geq 90$	$< 95$
B+	$\geq 87.5$	$< 90$
B	$\geq 85$	$< 87.5$
B-	$\geq 80$	$< 85$
C+	$\geq 75$	$< 80$
C	$\geq 70$	$< 75$
D	$\geq 60$	$< 70$
F	$< 60$	

TESTS (3) 15% Each	45%
Comprehensive Final Exam	25%
Project	15%
Homework	15%

**Attendance & Late Policy:** Attendance of the Zoom Meetings is mandatory and highly recommended. It is the student's responsibility to obtain lecture notes for missed classes.

Make-up Tests can be arranged if the student has a proper reason for missing the test and has notified the instructor before the test is given in the class. **Proper reasons include Medical Excuse with a doctor notice or an Immediate Family Member Funeral. You need to contact me in person in case these reasons are warranted. You can call at 216- 687-2567 and leave a message with the Mechanical Dept. Secretary. Also you can e-mail me at [e.barbari@csuohio.edu](mailto:e.barbari@csuohio.edu) with ESC 282 and kindly include your Name, Student ID Number, section number in the Subject/Title of your e-mail in order to receive a response from me by return e-mail. Kindly ensure that you follow this format when you send me an e-mail.**

The Exams will cover computations, theories and ideas covered in class. You will be allowed to use your book, notes, and a calculator during the Online exams. Also, old Tests with solutions, Laptops, I-Phones and I-Pads **are not allowed to be used in class and during the Online exams.** The exams will have the same format as the Homework assignment with 2 Parts. As part of the University's ongoing efforts to prevent cheating and based on evidence of increased use of headphones and earpiece devices to permit cheating on exams, all students are required to display their ears for the duration of any exam. This policy may require students to tuck long hair behind ears or pull it into a ponytail or hair clip; remove hoods, caps or hats, or pull hats and caps up above ears; pull back headbands, beanies, hijabs, bandanas or other head coverings to display the student's ears. Any student not complying with this policy will, after a warning, be issued a zero on the exam. Students with concerns about their compliance with this policy must speak to me before the final.

**Projects:** Information about the project, its content and its format will be discussed in class.

**Collaboration:** Each student must create his own unique deliverable solutions to the homework problems and online tests. Submitting an assignment containing information copied by any means (visual, cut and paste, etc.) from another student's work, **pirated author's solutions**, or any other source is unacceptable. Enough physical similarity between submitted assignments and any other source to create the suspicion that copying has occurred will result in loss of credit for all involved and possible academic discipline. Please read very carefully the attached document listed in the following page concerning plagiarism.

## PLAGIARISM :

*Adapted from Course Syllabus CPSC 361: Simulation Hiram College By Professor Dr. Oberta A. Slotterbeck*

*Academic misconduct (or plagiarism) is an act in which a student:*

- (a) seeks to claim credit for the work or efforts of another without authorization or citation;*
- (b) uses unauthorized materials or fabricated data in any academic exercise;*
- (c) forges or falsifies academic documents or records;*
- (d) intentionally impedes or damages the academic work of others;*
- (e) engages in conduct aimed at making false representation of a student's academic performance;*
- (f) assists other students in any of these acts.*

*Examples of academic misconduct include, but are not limited to: Cheating on an examination; collaborating with others in work to be presented contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above - including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed. Plagiarism is considered a very, very serious crime in the academic world and can result in you failing an assignment, failing a course, or even being dismissed from the college. Note that both the giver and the receiver can be held responsible. Be careful that you do not allow your work to lie around or that you leave files on computers others could access.*

**The bottom line: Do your own work. If you have any doubts, talk to your instructor -- *before* you do anything you might regret. A desire to "be a good buddy" could result in serious consequences if plagiarism is detected.**

**Academic Honesty.** "Cheating" means intentionally misrepresenting the source, nature, or other conditions of academic work to receive undeserved credit. Cleveland State University affirms that acts of cheating debase the academic degree awarded, have no place in the University, and are severe offenses to academic goals, objectives and the rights of fellow students. CSU does not tolerate any type of cheating and will take disciplinary action up to and including expulsion.

**Health and Safety Statement:** The COVID-19 pandemic is still present and serious. Before entering class, you should have completed your daily health assessment. While you are in class on campus, you are required to: sit in your designated seat, maintain physical distance, wear your facial covering (e.g., masks or face shields), always cough or sneeze into your elbow or tissue, use the materials provided to clean your desk and chair before and after use, and adhere to other public safety protocols and directives for your specific classroom/lab/studio.

Students who do not follow these health and safety requirements will be instructed to leave class immediately. Students who violate this protocol will need to leave the classroom and MAY be marked absent. Repeated violations of these health-saving protocols may lead to sanctions under the [Student Code of Conduct \(3344-83-04 \[E\] and \[Z\]\)](#) up to and including suspension or expulsion. The CSU community thanks you for your cooperation!

**Class Schedule (subject to change).**

		Date	Reading	Discussion
1	M	<b>18-Jan</b>		<i>No Class- Martin Luther King, Jr. Day</i>
2	W	20-Jan	1	Introduction to Engineering Economy and course
3	M	25-Jan	2	Cost Concepts and Design Economics
3	W	27-Jan	2-4	Cost Concepts and Design Economics, Time value of money and equivalence, Single payment,
4	M	1-Feb	4	Uniform series formulas, Gradient
5	W	3-Feb	4	Different Interest rates and Periods of compounding
6	M	8-Feb	4	Continuous compounding formulas, review for the test
7	W	<b>10-Feb</b>	<b>Chapters 1,2 &amp; 4</b>	<b>TEST NO.1</b>
8	M	<b>15-Feb</b>		<i>No Class- President's Day</i>
9	W	17-Feb	5	Present, Annual and Future worth analysis for One project and project assignment
10	M	22-Feb	5	Capitalized worth Analysis, Internal and External rates of return
11	W	24-Feb	6	Mutually exclusive alternatives, Present, Annual and Future worth analysis for Two projects
12	M	1-Mar	6	Incremental Analysis Method, Internal rate of return, review for the test, Analysis period considerations and review for the test 2
13	W	<b>3-Mar</b>	<b>Chapters 5 &amp; 6</b>	<b>TEST No. 2</b>
14	M	8-Mar	7	Depreciation methods
15	W	<b>10-Mar</b>		<i>No Classes- Reading/Study Day</i>
16	M	15-Mar	7	MACRS GDS and ADS Types of Depreciation
17	W	17-Mar	7	Depreciation and federal and state Corporate Income tax
18	M	22-Mar	7	Before and after-tax cash flow analysis & review-test 3
19	W	<b>24-Mar</b>	<b>Chapter 7</b>	<b>TEST No. 3</b>
20	M	29-Mar	9	Before tax Replacement Analysis, for Defender and Challenger
21	W	31-Mar	9	After Tax Replacement Analysis
22	M	5-Apr	9	After Tax Replacement Analysis and examples
23	W	7-Apr	10	Benefit-Cost analysis
24	M	12-Apr	10	Incremental Analysis for MEA
25	W	14-Apr	13	Capital Budgeting Process and WACC analysis
26	M	19-Apr	13	Capital Budgeting Process and WACC analysis
27	W	21-Apr	13	<b>Project Review/Contents and Methodology</b>
28	M	26-Apr	11	Buy or lease and sensitivity Analysis
29	W	<b>28-Apr</b>		<b>Project Due date, review for Final Exam</b>
	M	<b>3-May</b>		<b>Final Exam 4:00-6:00 pm</b>