MSE604 – Engineering Economy and Financial Analysis

CSUN – Spring 2024, Ticket 16012 - Friday 4:00 p.m.–6:45 p.m., Room: JD-3510

Instructor Ghassan "Gus" H. Elias: BS/MS; Industrial/Manufacturing Systems Engineering.
- Expertise: Engineering Consulting, Decision-Making, Facility Planning, Risk & Cost Analysis. Industrial Safety and Material Control: global certification programs for commissioning electronic & pneumatic devices in General (Non-Hazardous) Locations, Hazardous 'Classified' Areas and Potentially Explosive Atmospheres.
- Faculty Website: *http://www.csun.edu/~ghe59995/*
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TEXTBOOK

Engineering Economy, William G. Sullivan, Elin M. Wicks, C. Patrick Koelling**.**
17th Edition, Prentice Hall/Pearson, 2019.
ISBN-13: 978-0-13-487006-9 or ISBN-10: 0-13-487006-9

Pertinent course material and the PPT lecture slides are available at:

http://www.csun.edu/~ghe59995/courses.html#MSE604

CSUN CATALOG - COURSE DESCRIPTION:

Evaluation of economic feasibility from an engineering perspective. Application of various methods of comparing alternatives on an economic basis. Implications of depreciation, inflation, currency exchange rates and taxation on the profitability of engineering projects. Reviewing the basics of cost estimation and accounting. Development of income statement, cash flow statement and balance sheet for engineering projects. Other applications in corporate financial decision making are briefly covered.

COURSE OBJECTIVES:

This course is designed to enhance the student's knowledge of and ability to apply:

1. Identification, formulating and solving engineering problems.
2. Time-money relationships, cash flow, and effects of inflation.
3. Present worth (PW) method, annual worth (AW) method, rate of return (ROR) method, benefit/cost ratio (B/C) method, and incremental rate of return analysis.
4. Depreciation schedules, replacement analysis, and after-tax analysis.
5. Engineering economy principles in conjunction with the Fundamentals of Professional Engineering Examination and Registration Process.
6. Engineering cost, financial, economic analysis methods, and evaluation of technological alternatives.
7. The intellectual discipline of engineering and technology management.

STANDARD OPERATING PROCEDURES:

1. Class members are expected to maintain personal and professional standards consistent with the Code of Ethics of the national Society of Professional Engineers, the Preamble and Fundamental Canons of which are as follows:

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct. Engineers, in the fulfillment of their professional duties, shall:

- ***Hold paramount the safety, health and welfare of the public.***
- ***Perform services only in areas of their competence.***
- ***Issue public statements only in an objective and truthful manner.***
- ***Act for each employer or client as faithful agents or trustees.***
- ***Avoid deceptive acts.***
- ***Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.***

2. Students must submit **ORIGINAL WORK** only.
3. Students are expected to participate in class and on **CANVAS**.
4. Students are **responsible** for the course material, reading assignments, presentations and discussions.
5. ***Tardy/Late submissions are unacceptable*** ….. **NO EXCEPTIONS!**
6. Class members **MUST** always be **considerate & respectful** to their colleagues and to the instructor.

***** This course syllabus is your contract with the CECS, MSEM and the instructor. Students must read the syllabus thoroughly and adhere fully to ALL of the stated terms and listed guidelines. No Exceptions! *****

NOTE #1: Activate **and** use your CSUN email address for ALL academic correspondences. Do not use your personal email address to communicate with the instructor. Messages from non-CSUN email addresses will **NOT** be acknowledged. Instructor will only utilize SOLAR's email database to communicate with class.

NOTE #2: **The last day to drop classes is 09-Feb-2024. Students must initiate this process; not faculty. Failure to formally drop a course will result in a "WU" grade which is equivalent to an "F" grade; affecting your cumulative GPA detrimentally.**

The use of mobile phones is not allowed during the class sessions, throughout the semester.

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COURSE SCHEDULE

This is a ***TENTATIVE*** syllabus. Depending on the progress of the course material, the syllabus (dates, topics, assignments & exams) *may change* if deemed necessary. Sample problems will be solved during lectures. H.W. problems are due a week after they are assigned, unless otherwise noted. **Solution to H.W. problems will also be provided in class on the date of submittal.**

Week	Topic Area	Chapter	Homework Assignment
1-	Course/Subject Introduction Introduction to Engineering Economy	1	3, 5, 9, 11, 18
2-	Cost Concepts and Design	2	3, 12, 14, 16, 19, 20, 25, 30, 31, 40
3-	Cost Estimation Techniques	3	4, 6, 9, 11, 13, 15, 18, 23
4-	The Time Value of Money ***(MSE304 in a nutshell)***	4	1, 8, 14, 16, 25, 34, 44, 47, 56, 59, 66, 70, 81, 87, 90, 97, 100, 104, 112, 117, 119, 125
5-	Evaluating a Single Project	5	3, 5, 11, 14, 16, 17, 20, 22, 24, 30, 40
6-	Comparison & Selection Among Alternatives	6	4, 5, 23, 34, 36, 40, 43
7-	Depreciation & Income Taxes	7	6, 9, 11, 14, 18, 19, 27, 29 *** *Project Status Report Due****
8-	**Midterm Exam (30%)**	**Open Book/Open Notes**	**Chapters 1-7**
9-	☺ **NO INSTRUCTION / March 18-24, 2024** ☺		**SPRING BREAK – Be Safe / Have Fun**
10-	**Midterm Exam Graded & Returned** Price Changes and Exchange Rates	8	**Review Midterm Solution** 2, 3, 4, 8, 11, 15, 18, 21, 33
11-	Replacement Analysis	9	2, 3, 12, 13, 15, 21
12	Benefit-Cost Ratio	10	1, 4, 7, 10, 11, 12, 13, 24
13-	Breakeven & Sensitivity Analysis	11	1, 2, 4, 11, 19, 20, 21
14-	Probabilistic Risk Analysis	12	1, 2, 3, 5, 8, 23
15	The Capital Budgeting Process	13	1, 2, 4, 7, 9
16-	**Selected Group Presentations**	PPT (ALL members)	**Course Review & Wrap-up** ***Term Project Final Report Due****
17-	**FINAL EXAM (40% - COMPREHENSIVE) - Friday: 5:30pm – 7:30pm**		**Friday: 17-May-2024** **OPEN BOOK & OPEN NOTES**

EVALUATION & GRADING: plus/minus grading is used – refer to Page 7 for more info.

15% - **Weekly** quizzes (15-20 minutes): a **combination** of **open/closed** book/notes, given at the **beginning of the lecture**. **No make-up quizzes will be granted.**

30% - Midterm Exam (Chapters 1-7): open book & notes, calculator, ***no neighbors*****.**

15% - Group Research/Term Project ---- **to be assigned by the instructor.**
PPT file and in-class presentation
Self & Peer Evaluation Form (SPEF)
You can download the SPEF via the MSE604 webpage and on CANVAS.

Important Note: By not submitting the SPEF, you will forfeit the +/- sign for the course grade.

40% - Final Exam (***Comprehensive***): open book / open notes, calculator, ***no neighbors*****.**

NOTE: ONLY *ORIGINAL* WORK & NOTES ARE ALLOWED!

Letter-Grade Scale (Curving of grades will NOT be utilized!):

A ≥ 92	**88 ≤ A- < 92**	**85 ≤ B+ < 88**
80 ≤ B < 85	**78 ≤ B- < 80**	**75 ≤ C+ < 78**
70 ≤ C < 75	**68 ≤ C < 70**	**60 ≤ D < 68**	**F < 60**

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HOMEWORK GUIDELINES & ASSIGNMENTS:

H.W. solutions should be typed. Hand-written submittals are accepted when using 8.5"x11" **light-green 'engineering' paper**. No spiral notebook fringes. Use only single side of paper and staple pages together in upper-left-hand corner. Note the name and course number on **each** page. Write **legibly** and show all procedures & the methodology used in solving the problems. **Numerate** all the problems and present them sequentially. Indicate the beginning and the end of each problem. Limit of **2-3** problems **maximum** per page.

Problems will be assigned at the end of each lecture and homework is collected at the **start** of the following session (unless otherwise noted). ***Late submission is not allowed!***

All students will upload their homework solution via a specific CANVAS link.

Instructor will go over the solution to the assigned homework problems in class … but will not upload the solution online.

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Academic Dishonesty:

Academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form at California State University Northridge. All students involved in academic dishonesty will be disciplined in accordance with university regulations and procedures. Discipline may include suspension and/or expulsion from the University.

"Cheating or plagiarism in connection with an academic program at a CSU campus is listed in Section 41301, Title 5, California Code of Regulations as an offense for which a student may be expelled, suspended or given a less severe disciplinary sanction.

Academic dishonesty is an especially serious offense and diminishes the quality of scholarship and defrauds those who depend on the integrity of the University's programs." Please consult university policy regarding plagiarism and the consequences.

https://catalog.csun.edu/policies/academic-dishonesty/

Any student caught cheating or plagiarizing in this class will receive a zero for the assignment and may be referred to the dean's office for additional consequences.

Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person. The instructor reserves the right to submit your papers to turnitin.com for identifying papers containing unoriginal material.

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GROUP TERM PROJECT GUIDELINES:

- Groups of 4-6 members will be chosen randomly by the instructor.

- Topics for the group term project will be assigned by the instructor. The term project is worth **15%** of the course overall grade. All class members must participate in the research task and presentation.

- The **mandatory** "Self & Peer Evaluation Form" (posted on CANVAS and the course website) is due on **09-May-2024 by 11:59 pm (PST)**. Submitting the form is 100% required by all class members. The form should be "**typed**" and **not** hand-written or scanned. Students will individually and confidentially submit the form in **PDF** via a special link made available in the course module on CANVAS.

- The professionally-done PPT file (one upload per group!) is due on **09-May-2024 by 11:59 pm (PST)**. A complete write-up report is not required. Each group leader/facilitator shall upload the PPT file via s special link to be made available in the course module on CANVAS. **The PPT** must contain **25** slides (no more or less) and should be done professionally.

- The presentation must be informative, creative, rich, insightful and reader-friendly. The presentation should be comprehensive covering **all** aspects of the assigned topic/project. Follow the "Oral Presentations Rubric" that is posted on the course webpage and on CANVAS. Submissions that do not conform to the above format will not be accepted.

- The in-class presentations will take place from **May 10th, 2024.**

Important Note: All group members must participate (equally time-wise) in the class presentation. Students who are not present will be issued a ZERO for the term project.

It is a fundamental principle of academic integrity that the authorship of the intellectual content of works submitted as part of a class assignment must be fairly represented. Contributions of language and thought must be appropriately credited.

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For Your Information: Grade Evaluation Criterion

* 'A' grade range (A to A-) is reserved for work that is exceptional. This means that it (1) is professional and reflects the writer's/s' careful consideration of audience and purpose; (2) shows perfect to near-perfect understanding of the necessary concepts and analytical tasks; (3) where appropriate, it shows the capacity to think creatively or to see implications beyond the immediate scope of the question; (4) contains all necessary information (invention); (5) is arranged in a logical manner (6), is memorable; (7) delivery is visually appealing; and (8) is free of mechanical errors and is formatted as specified. Work must be flawless to attain an A/A-. Work with minor flaws that is nonetheless excellent in other ways will earn an A-.

* A grade in the B range means that the work is acceptable at the graduate level (B- range) to very good (B/B+). This work satisfies all (B+) or most (B/B-) of the requirements of the question & research tasks, shows the capability to think beyond the task by relating it to other areas of knowledge in or outside of the course; is neatly presented and shows above-average use of academic English. If the work is decently written, is formatted basically correctly, and covers most of the required content, but has several minor flaws or one major flaw, the grade is B-.

* A grade in the C range means that the work, while covering much of the required ground, does not show graduate-level analytic and expressive ability. That is, major and minor items may be missing or incorrect; and while the language may communicate most points adequately, it does not qualify as above-average academic work.

* A grade in the D range shows that the work does not, overall, achieve an acceptable level of coverage of the requirements AND/OR the language is insufficient to make the writer's points understandable to the reader. The content may be either incorrect to an unacceptable degree, or very incomplete.

* A grade of F indicates that so little of the required content is covered that grading the paper is an exercise in futility. It may mean that very major points have clearly not been grasped or have been misunderstood by the student. An F may also indicate that the ideas are expressed in such a way that they are not at all understandable to the reader. A grade of F is also awarded when assigned work is not handed in, or not handed in by the set deadline.