

UNIVERSITY OF FLORIDA
Department of Industrial and Systems Engineering

EIN 4354
Engineering Economy

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<u>TAs</u>	Pavlikov, Konstantin E-mail: kpavlikov@ufl.edu (Use E-learning E-mail)
<u>Description</u>	Basic principles and applications of economic decision-making between alternatives encountered in engineering systems projects. The analysis will include methodologies of economics and finance in addition to engineering fundamentals.
<u>Prereqs</u>	Upper division classification in engineering.
<u>Text</u>	Hartman, J.C., <i>Engineering Economy and the Decision-Making Process</i> , Prentice-Hall (Pearson), 2007. (Limited copies are available in the library.)
<u>Grading</u>	Midterm Exam..... 100 points (10% final grade) Final Exam..... 200 points (20% final grade) Quizzes (22, drop 2)..... 400 points (25% final grade) Projects (4)..... 350 points (35% final grade) Activities (5) 70 points Discussions (5)..... 45 points Survey/Intro quiz (7).....40 points (Activities, Discussions and Surveys comprise 10% of final grade)
<u>Scale</u>	Grading is based on a straight scale: A: 92 – 100; A-: 90 – 91.9; B+: 88 – 89.9; B: 82 – 87.9; B-: 80 – 81.9; C+: 78 – 79.9; C: 72 – 77.9; C-: 70 – 71.9; D+: 68 – 69.9; D: 62 – 67.9; D-: 60 – 61.9; F(E): 59.9 and lower. Grades are calculated to the second decimal place. Second decimal place values of 5 or higher are rounded-up to compute the single decimal place value.
<u>Grades</u>	“A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division

GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

- Exams A midterm exam and a final exam will be given in a proctored location. See the DUE DATES sheet.
- Quizzes Quizzes are associated with nearly every module. There are 22 in total. The two lowest will be dropped. See the DUE DATES sheet.
- Participation Posted activities, discussions and surveys comprise 155 points in total. See the DUE DATES sheet.
- Projects A number of comprehensive assignments will be given over the course of the semester. Some of the work will be performed in teams while others will be performed alone. See the DUE DATES sheet.
- Tips Stay up with the class! Schedule time... online means more of your time!
- Disabilities Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation
- Counseling Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
- Software All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.
- Honor Code All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your

obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

Course objectives

Upon completion of this course, students will:

- understand the meaning of the “time value of money”, inflation, deflation, exchange rates, and interest and their application to economic analysis
- understand and apply the steps of the economic decision-making process, including defining a problem, generating solution alternatives, estimating cash flows, analysis, selection, implementation and post-implementation analysis,
- be able to financially describe investment alternatives with cash flows and cash flow diagrams
- be able to estimate before tax cash flows and convert them into after-tax cash flows under the assumption of current U.S. tax law
- understand the concept of economic equivalence for the basis of comparing mutually exclusive alternatives
- be able to analyze cash flows diagrams, including finding the present worth, annual equivalent, future worth, internal rate of return, payback period, payback period with interest, and project balance
- be able to analyze a set of mutually exclusive alternatives, even if they have unequal lives, and identify viable alternatives
- understand the uncertainty inherent in cash flow analysis and be able to recognize its impact through the use of sensitivity analysis
- be able to understand risk and analyze risky projects with the use of probability theory, simulation and decision trees
- be able to evaluate multiple alternatives under constraints and with multiple attributes
- be able to solve common equipment replacement and economic life problems
- understand a government’s or municipality’s role in investment analysis and be able to apply benefit-cost analysis in these situations
- appreciate the difficulty with making a capital investment decision and understand the risk involved with such a decision

Contribution of course to meeting the professional component: The Engineering

Economy course provides the student with the basic mathematical, modeling, and conceptual skills to compare competing design proposals from the point of view of economic efficiency as well as engineering efficiency. Technical proposals must ultimately be expressed and measured in terms of material and manufacturing costs to provide a given product and service and those costs then measured against the likely cash flows to be generated in the market, allowing the overall profitability and financial feasibility of such projects to be assessed. The units on federal tax policy and public sector projects also touch upon social and political considerations. Thus tax policy may implicitly favor and encourage corporations to make greater investments in R & D through an

orchestrated series of directed tax credits and deductions. Likewise, the political and economic viability of large projects are discussed in the course.

This course contributes to the program outcomes by teaching students to: Identify, formulate and solve engineering problems; Understand professional and ethical responsibilities.