

IE 343 – Engineering Economics, Fall 2025

Section 003

CRN: 32203; Course Credits: 3

Course description: Cost measurement and control in engineering studies. Basic accounting concepts, income measurement, and valuation problems. Manufacturing cost control and standard cost systems. Capital investment, engineering alternatives, and equipment replacement studies. Not open to students with credit in C E 394.

Instructor: Prof. Hua Cai

Course format: This course will be taught face-to-face. This is an IMPACT course and is taught with a partially flipped style. We will meet in the classroom on the first Monday (8/25) and on some Mondays (9/8, 9/22, 11/3, and 12/1) for practice or exam review sessions. About half of the Monday class sessions are left to you to review the course pre-session contents for Wednesdays' and Fridays' classes. Please see the course schedule at the end of this syllabus for more information.

Contact the instructional team:

- If your question is content related (e.g., clarifications on concept, how to approach a homework problem, exam policies etc.), please ask them on the course **Discussion board** on course website. We monitor the discussion board multiple times in a day. Posting your questions there can help benefit other students who may have the same question. You can also try to answer each other's questions on the Discussion board and earn extra credits from being a "peer tutor".
- If your question is more personal, please send us an email and **include "[IE 343]" in the subject line** (so your email can receive prioritized attentions). Please use your *@purdue.edu* email account to avoid your email being filtered into the spam folder. Emails will be responded in 48 hours. Emails sent over the weekend will be processed on the following Monday or Tuesday.
- **Your feedback is welcomed at any time during the semester.** We are here to help your learning. Please help us to better help you!

Textbook: Sullivan, W.G., Elin Wicks, and Patrick Koelling (2014). Engineering Economy (16th edition). Pearson Education, Inc. ISBN: 0133439275. The readings associated with each session is listed in the course schedule.

Website: Brightspace (<https://purdue.brightspace.com/d2l/home/1366429>). All applicable course material and any course announcements will be found on the course website. *Check Brightspace regularly for updates!*

Learning Outcomes:

After taking this course, you should be able to:

1. Evaluate the worth of a cash flow series using the concept of time value of money;
2. Compare the feasible alternatives for a project and select the best option from the economics perspective;
3. Analyze the impact of taxes and foreign exchange rates in project evaluation; and
4. Apply the principles of engineering economy to analyze projects and understand strengths and weaknesses.

Evaluation:

- **Pre-session Assignments:** Before attending each session, you are required to watch the pre-session videos and complete the pre-session quiz (sessions without pre-session assignments will be clearly marked as so). *It is important that you come to class prepared!* You can retake the pre-session quiz for an *unlimited* number of times during its open time (but the question will change with each attempt). The highest grade will be used. The pre-session quiz closes half an hour before the session's start time, at 4 pm.
- **Homework:** Individual homework help you practice the contents you learned from each session in a more integrated way. Homework is due weekly and there are a total of 12 homework assignments. Homework assignments are generally due on Tuesdays (with two exceptions as marked in the course schedule) and are breakdown into sessions to make it easier for you to complete the homework problem after each session. To help you learn from your mistakes, *five attempts* are allowed for homework problems. For each attempt to be counted as valid, the accompanying solution file also needs to be submitted (separately in Brightspace). The solution file answer needs to match the answer submitted in Variate for the attempt to be counted as valid.
- **Case Study:** Group case study help you put together the different pieces of knowledge you learned throughout the course to evaluate a more complex real-world problem. A case study report and a recorded group presentation video is required, presenting the analysis, results, and recommendations. The groups are self-formed with 4 students in each group. If you need help to form a group, please let Prof. Cai know.
- **Exams:** This course has three mid-term exams and does not have a final exam. The exams are not cumulative but the content itself is (e.g., Exam 2 will not specifically test you about contents covered in Exam 1. But to solve problems in Exam 2, you will need to use the knowledge you have learned in the material covered by Exam 1). Each exam takes one hour. *DRC students who need exam accommodation should communicate with Prof. Cai and schedule the alternative*

exam time as close to the class exam schedule as possible. The exam is closed book but allows *one double-sided A-4 size crib sheet*. The exact date and time for the exams will be announced later, depending on the university evening exam scheduling. The exam dates marked in the course schedule can be used as an appropriate reference.

Note: Late assignment policy: late assignments will NOT be accepted unless an extension is requested and approved before the submission deadline on reasonable grounds.

Grade Breakdown:

- **Pre-session Quiz – 11%**
- **Homework –34%** (Each homework problem has five attempts. The highest grade will be used.)
- **Case Study – 15%** (5% for the presentation and 10% for the report)
- **Exam 1 - 10%**
- **Exam 2 - 15%**
- **Exam 3 - 15%**
- **Extra Credit – 3%** (You can earn up to 2% extra credits by serving as a Peer Tutor by 1) answering peer questions posted on the Brightspace Discussion Board or 2) developing creative course contents. The total extra credit is capped at 3% for both categories together. More details will be announced in class.)
- **Extra Credit Individual Project** (Additional extra credit opportunities may also be released during the semester in the form of individual project.)

Grading Scale* :

>=98	A+	80-84	B-	64-68	D
94-98	A	78-80	C+	60-64	D-
90-94	A-	74-78	C	<60	F
88-90	B+	70-74	C-		
84-88	B	68-70	D+		

Note: * No grading scale curving or modification will be implemented in this course. Please work hard from Day 1 to obtain your desired grads.

How to be successful in this course:

- Follow the course schedule and pace to go session by session.
- Before each session, watch pre-session videos and complete pre-session quizzes.
- Be engaged during the class. Participate in solving the problems and ask/answer questions! Take notes.
- Review course slides to make sure that you understand the examples before starting to work on the homework assignments. Read related textbook sections if needed.
- Complete the homework following each corresponding session is preferred.
- Document your steps to solve the homework assignments. Having the details will help you diagnose mistakes and seek help. The solution you generated will also be great learning materials for you to review to prepare for exams.
- If you have any questions, post them on the discussion board or reach out to the instructional team.
The later materials are built upon the previous contents. So don't wait for too long to clear your questions.
- Generate a study plan to block time to study for this course. Past students have found using a "studying calendar" customized to their class calendar is very helpful.

Academic Integrity:

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

Policy to Use AI and LLM Tools:

I am supportive of using AI and LLM tools to assist learning in this course. If AI-generated contents are used in assignments, disclaim statements should be added to declare the use and clearly identify how you worked with the AI tools to produce the submitted materials.

Nondiscrimination Statement:

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. More details are available on our course Brightspace table of contents, under University Policies and Statements.

Accessibility:

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247. More details are available on our course Brightspace under Accessibility Information.

Mental Health/Wellness and Basic Needs Security:

- **If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [WellTrack](#).** Sign in and find information and tools at your fingertips, available to you at any time.
- **If you need support and information about options and resources,** please contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8 a.m.- 5 p.m.
- **If you find yourself struggling to find a healthy balance between academics, social life, stress, etc.,** sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.
- **Any student who faces challenges securing their food or housing and believes this may affect their performance in the course** is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday.

Emergency Preparation:

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis. Please also familiar yourself with Purdue's Emergency Preparedness website (<https://www.purdue.edu/ehps/emergency-preparedness/>).

Please also review relevant university policies and statements on course website.

Class Calendar: The following schedule is tentative and subject to change. You will be notified on Brightspace for any changes.

Fall 2025 Schedule[&]

This course is an IMPACT course that has been partially flipped for active learning. Before each session, please watch the pre-session videos and take the pre-session quiz to learn the basic concepts. During each session, we will spend the class time applying the equations for problem solving. After each session, please complete the post-session quizzes to test your knowledge on the covered contents. The homework assignments require you to apply contents from different sessions to analyze and solve more complex problems. To account for the pre-session work you need to do, the class will not meet on most Mondays unless otherwise noted (e.g., for exam review sessions).

Note: [&] The schedule is subject to change.

[#] Homework assignments are due on Tuesdays at noon (12pm)

^{*} Exact exam time and location will be announced later.

Week	Monday	Wednesday	Friday
1	8/25 Session 0: Introduction and Course Admin	8/27 Session 1: Time Value Readings: 4.1-4.3	8/29 Session 2: Cash Flow Analysis I Readings: 4.4-4.6
2	9/1 (Labor Day) HW-1 due (S1-S2) [#]	9/3 Session 3: Cash Flow Analysis II Readings: 4.4-4.9	9/5 Session 4: Cash Flow Analysis III Readings: 4.11-4.12
3	9/8 Session 5: Cash Flow Analysis IV (practice) Readings: 4.11-4.12 HW-2 due (S3-S4) [#]	9/10 Session 6: Effective Interest I Readings: 4.14-4.15	9/12 Session 7: Effective Interest II Readings: 4.14-4.15
4	9/15 (<i>*studying time, class does not meet</i>) HW-3 due (S5-S7) [#]	9/17 (<i>Class cancelled for evening exam time</i>)	9/19 Session 8: Cost Estimation Readings: 2.1, 3.3-3.4
5	9/22	9/24	9/26

	Session 9: Exam 1 Review HW-4 due (S8)#	Session 10: Principles Readings: 1.1-1.3 Exam 1*	Session 11: Project Evaluation I Readings: 5.1-5.5
6	9/29 <i>(Studying time, class does not meet)</i> HW-5 due (S11)#	10/1 Session 12: Project Evaluation II Readings: 5.6	10/3 Session 13: Project Evaluation III Readings: 5.7-5.8
7	10/6 <i>(Studying time, class does not meet)</i> HW-6 due (S12-S13)#	10/8 Session 14: Comparing Alternatives I Readings: 6.1-6.5	10/10 Session 15: Comparing Alternatives II Readings: 6.5
8	10/13 <i>(Fall Break)</i>	10/15 Session 16: Depreciation I Readings: 7.1-7.5 HW-7 due (S14-15)	10/17 Session 17: Depreciation II Readings: 7.4-7.5
9	10/20 <i>(Studying time, class does not meet)</i> HW-7 due (S16-S17)#	10/22 <i>(Class cancelled for evening exam time)</i>	10/24 Session 18: Exam 2 Review
10	10/27 <i>(Studying time, class does not meet)</i>	10/29 <i>(Class cancelled for evening exam time)</i> Exam 2*	10/31 Session 19: Tax and ATCF Readings: 7.6-7.11
11	11/3 Session 20: Tax and ATCF Readings: 7.6-7.11 (practice) HW-8 due (S19)#	11/5 Session 21: Price Changes I Readings: 8.1-8.6	11/7 Session 22: Price Changes II Readings: 8.1-8.7 Introduce case study
12	11/10 <i>(Studying time, class does not meet)</i> HW-9 due (S20-S21)#	11/12 Session 23: Replacement Analysis I Readings: 9.1-9.10 HW-10 due (S22)	11/14 Session 24: Replacement Analysis II Readings: 9.7-9.10
13	11/17 <i>(Studying time, class does not meet)</i> HW-11 due (S23-S24)#	11/19 Session 25: Benefit-Cost Ratio Readings: 10.1-10.10	11/21 Session 26: Breakeven and Sensitivity Readings: 11.1-11.3
14	11/24 <i>(Studying time, class does not meet)</i> HW-12 due (S25)#	11/26 <i>(Thanksgiving Vacation)</i>	11/28 <i>(Thanksgiving Vacation)</i>
15	12/1 Session 27: Exam 3 Review	12/3 Case study working time Exam 3*	12/5 Case study working time
16	12/8 Case study working time	12/10 Case study working time	12/12 Case study working time

Disclaimer: This syllabus is subject to change. Please check the course website for the latest version. You will be notified of any changes as far in advance as possible via an announcement on Brightspace. Monitor the course website and your Purdue email daily for updates.