

ISE 307: Engineering Economic Analysis

Lecture 1: Introduction and Logistics

Term 253 (Summer)

Instructor: Mansur M. Arief

Industrial and Systems Engineering, KFUPM

Office: 22-219 — Email: mansur.arief@kfupm.edu.sa

Lecture 1

Course Introduction & Logistics

Lecture 1 Outline

- About this course and your instructor
- How this course works for Term 253
- Course logistics, grading, and policies
- Why engineering economics?
- What we will cover in 8 weeks
- Tips for success

Course Info: ISE 307, Engineering Economic Analysis

Course Details:

- Credit Hours: 3
- Term: 253 (Summer, 8 weeks)

Class Schedules:

- 01: S-W, 9:30-10:45, 24-146
- F03: S-W, 11-12:15, 24-121

Required Textbook: Chan S. Park,
*Fundamentals of Engineering
Economics*, 3rd Edition, Pearson

Office Hours:

- 01: Mondays, 1-2 PM, 22-219
- F03: Tuesdays, 1-2 PM, 22-219

Additional Resources:

- Blackboard (lectures, assignments, grades)
- Gradescope (homeworks)

Communication: Email at
mansur.arief@kfupm.edu.sa

Learning Outcomes

- Identify key compounding parameters that affect project performance based on sensitivity analysis (6)
- Apply decision making procedures for selecting engineering projects (1)
- Compute the impact of interest rate compounding, inflation, depreciation, cost-benefit analysis and other economic factors on projects' feasibility (1)
- Assess the economic feasibility of investments related to engineering projects (1, 6)
- Evaluate policies for assets replacement (2)

About Your Instructor

Mansur M. Arief

- BE in ISE, ITS, Indonesia
- MSE in Ind and Ops Eng, University of Michigan, Ann Arbor, USA
- PhD in Mech Eng, Carnegie Mellon University, Pittsburgh, USA
- Researcher, Stanford (AI Safety and Minerals Supply Chains)
- Executive Director, Stanford Center for AI Safety
- **Current research:** AI safety, decision-making under uncertainty

Feel free to reach out!

Your turn, please introduce yourself...

- Name, department, and year
- One thing you hope to get out of this course (knowledge/skills, grades, connections, etc.)

ALSO,

- if you are endowed with SAR 1 billion to manage energy transition mineral supply chains in Saudi Arabia, **what would you do?**

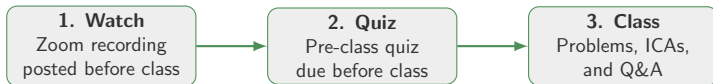
Imagine you ...

are endowed with SAR 1 billion to manage energy transition mineral supply chains in Saudi Arabia. What would you do?

- Is this a decision problem?
- What are the goals or objectives?
- What are the relevant information?
- What are the feasible alternatives?
- What is the decision criterion?
- What is the best alternative?

We will use engineering economic tools to help you make the best decisions.

How This Course Works for Term 253



- Lectures (like this one!) are posted with a **Zoom recording** at least 24 hours before each class
- Each recording has a short **pre-class quiz** (3–5 attendance questions) due before class starts — this and in-class activities are how attendance is recorded
- Class times are for **Q&As and solving problems together**, not lectures

Watch → Quiz → Come to class ready to practice

Grading Policy

Grade Distribution:

Component	Weight
Attendance	5%
Homeworks	10%
Classwork and Quizzes	10%
Major Exam I	25%
Major Exam II	25%
Final Exam	25%
Total	100%

Letter Grades:

A+	95–100
A	90–94
B+	85–89
B	80–84
C+	75–79
C	70–74
D+	65–69
D	60–64
F	Below 60

*Might be slightly adjusted based on
all-section performance*

Course Policies #1

Attendance:

1. Attendance = pre-class quiz submitted before class time (9:30 AM or 11:00 AM) + in-class activities
2. Two free absences (without penalty); 1.25% penalty/absence after that
3. DN grade upon the 6th unexcused absence
4. Any excuses must be official from the student affairs office

Academic Integrity:

1. All quizzes and exams are individual work — zero tolerance for cheating
2. Homeworks and in-class activities can be completed in groups, but the work must be completed individually
3. Any indication of plagiarism or cheating will result in 0 and a report to the student affairs office

Course Policies #2

Assignments:

1. ALL assignments are graded and weighted based on the grading policy
2. If you scored between 5%-95% in a homework or quiz, you may take makeup assignments within a week after the grade is posted (and may receive a maximum score of 95% of the original full scores)
3. No makeup assignments if you did not submit HWs or quizzes entirely
4. No makeup attendance (for missing pre-class quizzes or in-class activities)
5. You may submit late assignments (up to 48 hours after the deadline) but they will be penalized by 20% per day
6. If you have any valid official excuses for missing a class or HWs or quizzes, send me an email before the deadline so you will not be penalized for the late submission

Course Policies #3

Communication & Conduct:

1. All assignments must be in English, with proper academic formatting
2. Our main communication channel is email (not MS Teams)
3. For extra office hours, make an appointment via **mansurarium.github.io/calendar**
4. Regrading requests must be submitted in writing, within a week after the grade is posted

Wellbeing:

1. Please take care of your mental and physical health
2. If you feel overwhelmed, stressed, or anxious, please seek proper help
3. Above all else, our goal is to provide a safe and respectful environment for everyone. Please be respectful of others and yourself.

Exam Schedule (to be announced in Blackboard)

Exam	Tentative Timing	Coverage
Major I	Week 3/4	Chapters 1–4
Major II	Week 6/7	Chapters 5–7
Final	Per registrar	Chapters 9, 11, 12

No makeup exams without prior request and valid official documentation from the student affairs office.

Course Overview

Part 1: Money & Its Management

- Ch 1: Engineering Econ. Decisions
- Ch 2: Time Value of Money
- Ch 3: Understanding Money Mgmt
- Ch 4: Equivalence under Inflation

Part 2: Evaluating Projects

- Ch 5: Present-Worth Analysis
- Ch 6: Annual Equivalence Analysis
- Ch 7: Rate-of-Return Analysis

Part 3: Special Topics

- Ch 9: Depreciation & Income Taxes
- Ch 11: Project Uncertainty
- Ch 12: Replacement Decisions

Why Engineering Economics?

Engineers (you) make money decisions every day

Equipment & Process

- Which machine should we buy?
- Should we use robots/AI?

Projects & Investment

- Is this project worth investing?
- Build a new facility or expand the old one?

Replacement & Maintenance

- Keep an equipment or replace?
- If not now, when?

Personal Finance

- Car loan vs. lease?
- How do mortgages and savings actually work?

Engineering proposals compete for limited money. The winning proposals are justified economically.

Tips for Success (in this 8-week course)

Do:

- ✓ Watch recordings before class
- ✓ Submit pre-class quizzes on time
- ✓ Come to class ready to practice
- ✓ Start assignments early
- ✓ Monitor performance proactively
- ✓ Stay well!

Don't:

- ✗ Let recordings pile up — 4 classes/week!
- ✗ Skip in-class problem sessions and quizzes!
- ✗ Just memorize formulas (without understanding cash flows)
- ✗ Wait until you're lost to ask

You are here by your choice this summer, so let's make it count!

Before Our Next Class (Lecture 2)

Your to-do list:

1. Review the recording for this intro lecture (optional)
2. Watch the **Lecture 2 recording** early
3. Complete the **Lecture 2 pre-class quiz** on Blackboard before class
4. Come to class ready to discuss

Before Our Next Class (Lecture 2)

Your to-do list:

1. Review the recording for this intro lecture (optional)
2. Watch the **Lecture 2 recording** early
3. Complete the **Lecture 2 pre-class quiz** on Blackboard before class
4. Come to class ready to discuss