

M 1482 ENGINEERING ECONOMY

LECTURE NO.1 (Spring 2026) [4th year General Mechanical]

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LECTURE RULES



*Dream big, stay positive,
work hard, and enjoy
the journey.*

COURSE SPECIFICATIONS

- Course code-title: **M 1482 - Engineering Economy**
- **4th level** in General Mechanical
- Course duration: **One semester**
- Course type: **Compulsory**
- **4** contact hours [2 Lecture + 2 Tutorial]
- Total grades: **100** [40 Semester work, 60 Final exam]
- Minimum grades for success: **50** [Pass grade, percentage $\geq 50\%$]
- Course pre-requisite: **Nil**
- Lecture scheduled on **Sunday** in **303 Hall**, third floor



COURSE SPECIFICATIONS

Course Contents:

- Basic concept of engineering economy
- Cash flow
- Compound interest formula
- Time value of money
- Nominal and effective interest
- Economic equivalence
- Present worth value
- Benefit/Cost ratio
- Annual cost
- Economic analysis of engineering alternative
- Rate of return
- Depreciation
- Income taxes



BASIC CONCEPT OF ENGINEERING ECONOMICS

- Economy is a science that study how a society organizes its limited resources to satisfy unlimited wants and needs *under the condition of scarcity*.

- The Economic Landscape:

- *Microeconomics.*
- *Macroeconomics.*



BASIC CONCEPT OF ENGINEERING ECONOMICS

- Engineering economy involves formulating, estimating, and evaluating the expected economic outcomes of alternatives designed to accomplish a defined purpose. Mathematical techniques simplify the economic evaluation of alternatives.
- *Decisions involve money, called **capital** or capital funds, which is usually limited in amount, of where and how to invest this limited capital is motivated by a primary goal of **adding value** as future, anticipated results of the selected alternative are realized.*
- *Core principles: Develop alternatives - Focus on differences - Use a consistent viewpoint - Use a common unit of measure.*

BASIC CONCEPT OF ENGINEERING ECONOMICS

- The estimates and the decision usually involve four essential elements:
 - Cash flows
 - Times of occurrence of cash flows
 - Interest rates for time value of money
 - Measure of worth for selecting an alternative.



BASIC CONCEPT OF ENGINEERING ECONOMICS

- The criterion used to select an alternative is called a measure of worth:

Present worth (PW)

Future worth (FW)

Annual worth (AW)

Rate of return (ROR)

Benefit/cost (B/C)

Capitalized cost (CC)

Payback period

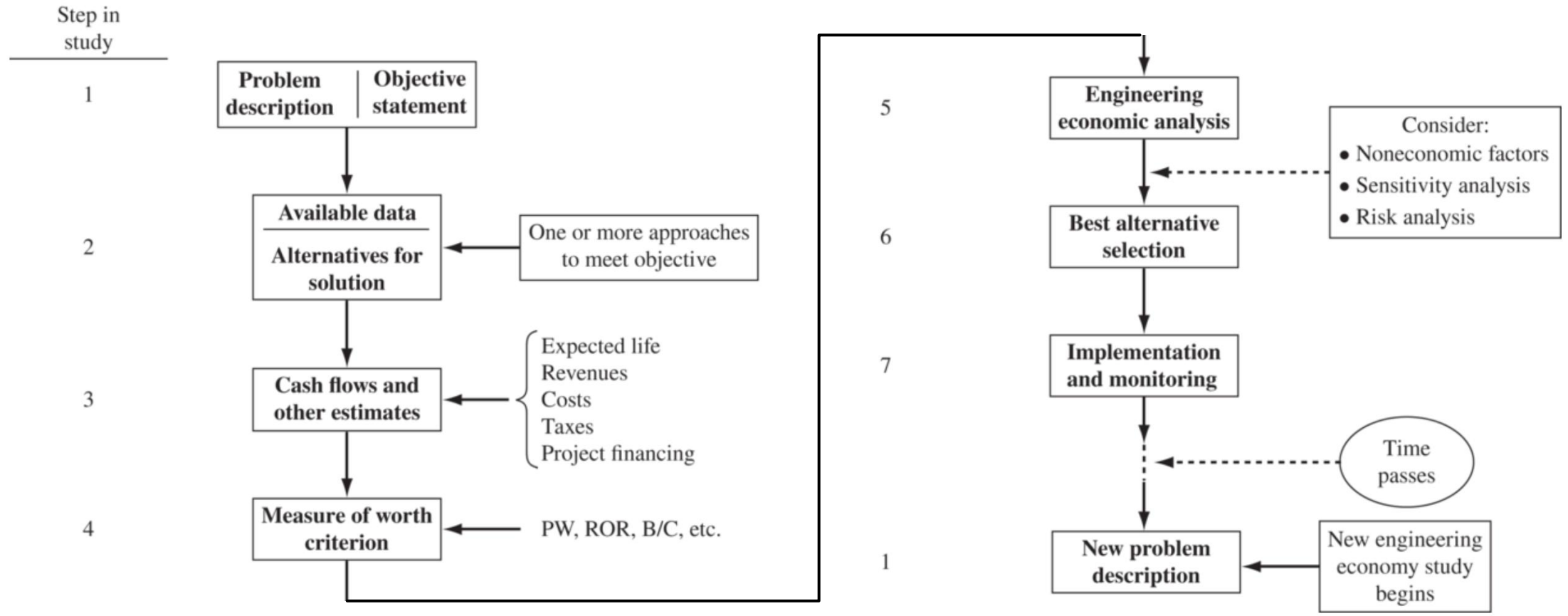
Profitability index

Economic value added (EVA).

*All these measures of worth account for the fact that money makes money over time. This is the concept of the **time value of money**.*

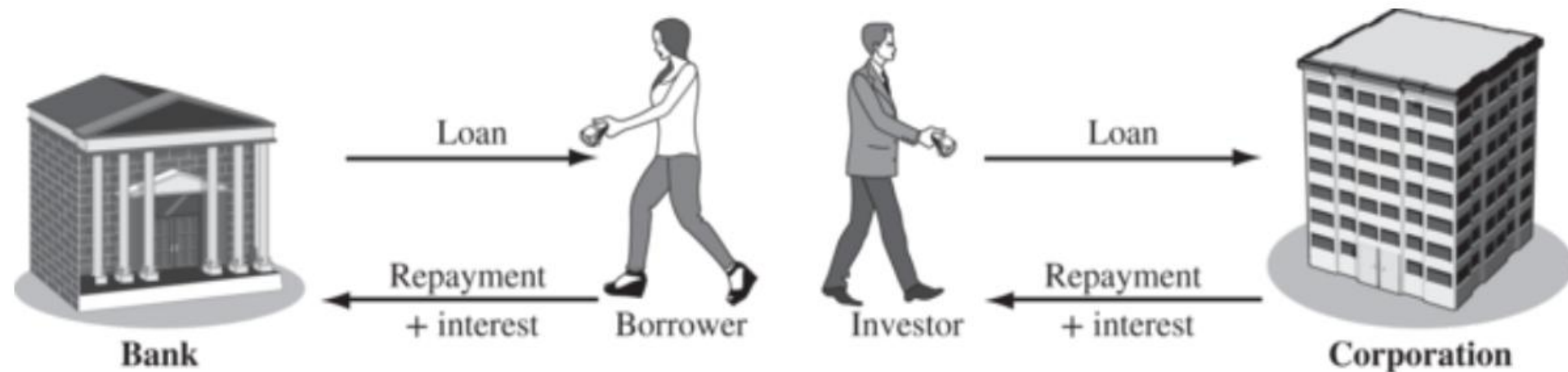


BASIC CONCEPT OF ENGINEERING ECONOMICS



BASIC CONCEPT OF ENGINEERING ECONOMICS

- Interest rate and rate of return:



$$\text{Interest rate}(\%) = \frac{\text{interest accrued per time unit}}{\text{principal}} \times 100\%$$

$$\text{Rate of return}(\%) = \frac{\text{interest accrued per time unit}}{\text{principal}} \times 100\%$$

BASIC CONCEPT OF ENGINEERING ECONOMICS

- Terminology and symbols:

P = value or amount of money at a time designated as the present or time 0.

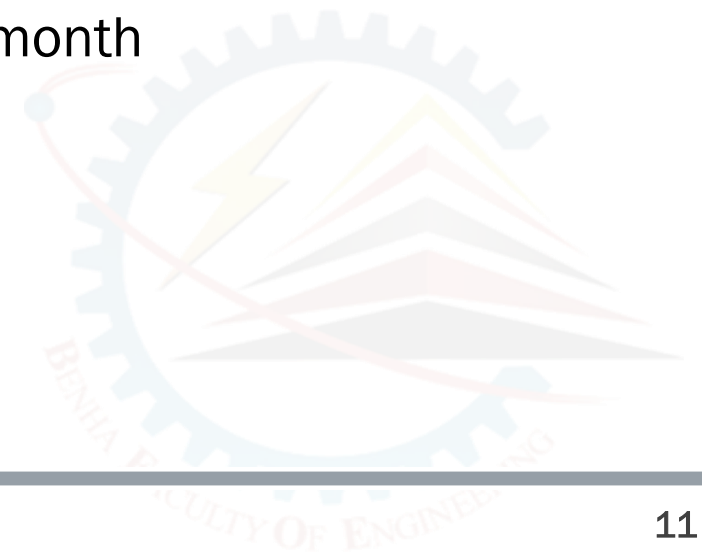
F = value or amount of money at some future time.

A = series of consecutive, equal, end-of-period amounts of money.

n = number of interest periods; years, months, days

i = interest rate per time period; percent per year, percent per month

t = time, stated in periods; years, months, days.



BASIC CONCEPT OF ENGINEERING ECONOMICS

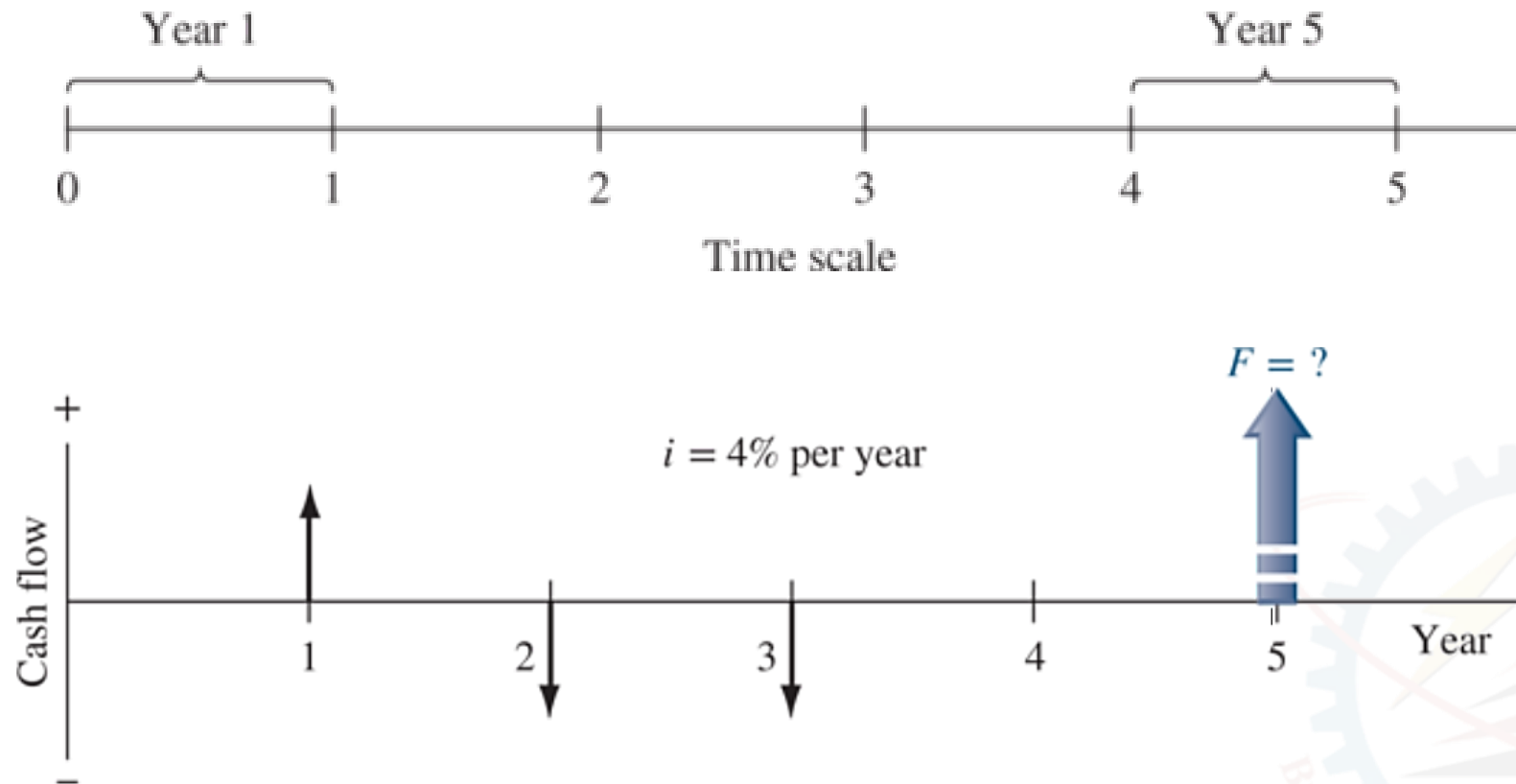
- Cash flows:

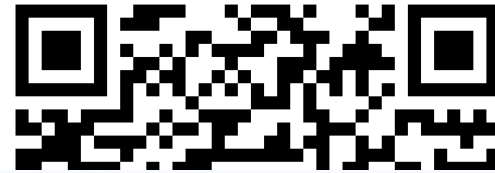
Cash inflows are all types of receipts, including sales, revenues, incomes, money from a loan when received from the lender, and savings generated by project and business activity. A plus sign indicates a cash inflow.

Cash outflows are all types of costs, including disbursements, expenses, deposits into retirement or savings accounts, loan repayments, and taxes caused by projects and business activity. A negative or minus sign indicates a cash outflow.

BASIC CONCEPT OF ENGINEERING ECONOMICS

- Cash flow diagram:





 Classroom



END OF LECTURE

