Importance of Engineering Economics

Lecture 1
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What is Engineering Economy ???

Engineering economy is a subset of economy for application to engineering projects.
Engineers seek solutions to problems, and the economic viability of each potential alternative or design is normally considered along with the technical aspects.
Engineering economy involves the evaluation of the costs and benefits of proposed projects.
Why Engineering Economy is Important?

- There are lots of factors that are considered in making Decisions, these factors are combinations of economic and non economic ones.
- Engineers play a major role in investment by making decisions based on economic analysis and design considerations.
Thus, decisions often reflect the engineer’s choice of how to best invest funds by choosing the proper alternative out of a set of alternatives.
Role of Engineering Economy in Decision Making

- Engineers make decisions but tools and computers do not.
- Tools assist engineers in making decisions.
- Decisions affect what will happen in the future and thus the time frame of engineering economy is the future.
- So, engineering economy analysis presents the best estimates of what is expected to occur.
Role of Engineering Economy in Decision Making
- Understand the Problem
Collect all relevant data/information
Define the feasible alternatives
- Evaluate each alternative
Select the “best” alternative
• Implement and monitor
Role of Engineering Economy in Decision Making

- The economic evaluation of alternatives is based on the so-called “Measure of Worth” such as:
  - Present worth: amount of money at the current time
  - Future worth: amount of money at some future time
  - Payback period: Number of years to recover the initial investment and a stated rate of return.
  - Rate of return: Compound interest rate on unpaid or unrecovered balances.
  - Benefit/cost ratio
There are other factors that affect the decision making such as:
Social
Environmental
Legal
Political
Personal

Personal

Personal

Personal

Personal

Personal

Personal

Personal
This may place less reliance on the economic-based factors yet this also shows the importance of knowing all the involved factors including the economic ones.
Time Value of Money

- Time Value of Money (TVM) is an important concept
- TVM is based on the concept that money that you hold today is worth more because you can invest it and earn interest
• For instance, you can invest your dollar for one year at a 6% annual interest rate and accumulate $1.06 at the end of the year.
• You can say that the future value of the dollar is $1.06 given a 6% interest rate and a one-year period.
THINKING LIKE AN ECONOMIST

Every field of study has its own language and its own way of thinking:
Mathematicians talk about integrals, and vector spaces.
Psychologists talk about ego, and cognitive dissonance
Lawyers talk about the legal terms.
Economics is no different. Supply, demand, elasticity, comparative advantage, consumer surplus, deadweight loss—these terms are part of the economist’s language.
Economic Order of Islam

Cost

Economic order quantity

Holding cost

Ordering cost

Quantity

Corporate Finance

equity Debt
assets
inventory
inventory
inventory
ISLAM is not an ascetic religion and does not aim at depriving Muslims of the 'good things that God has provided' (al-Qur'an, 7: 32).
Virtue therefore lies not in shunning the bounties of God, but in enjoying them within the framework of the values for 'righteous living' through which Islam seeks to promote human welfare.