

Chapter 1: INTRODUCTION TO ENGINEERING ECONOMY

After studying Chapter 1, the students should be able to :

- ▶ Understand the need for Engineering Economy in the field of engineering.
- ▶ Understand the basic Engineering Economy.
- ▶ Determine the role of Engineering Economy in decision making.

1.1 Introduction

- ▶ Development in science and technology causes changes for improvement.
- ▶ Knowledge in the field of engineering is very important, for example in designing a product or services.
- ▶ Decision making requires a systematic financial management.

1.1 Introduction

- ▶ Engineering and economic are closely related.
- ▶ Economic Engineering involves systematic evaluation in financial management in solving engineering problems.

1.2 The Need for Engineering Economy

- ▶ The decision to choose between alternatives depend on the monetary factors
- ▶ The decision made is a balance between a combination of technical and economic aspect.

1.2 The Need for Engineering Economy

May be categorized into 3 programs:

- ▶ Program to increase profit; example, development of a new product, increasing new production capacity, and improving customer service centre.
- ▶ Cost control programs such as, defect reduction programs because each defect is costly, efficiency improvement, waste reduction and liabilities reduction programs.
- ▶ Facilities/ infrastructure programs such as construction of roads, bridges, playground etc. These programs are not profit oriented but rather focus on increasing convenience and comfort at minimum cost.

1.2 The Need for Engineering Economy

:Decision is classified into 3 :

- ▶ **Expansion**; production capacity, exploring new market for product or service.
- ▶ **Replacement** ; replacing existing method with the optimum and least costly method, equipment, process or location.
- ▶ **Closure** ; usually the last resort; more towards investment decision such as closing down factory, termination of projects and others.

1.3 Decision Making Process

- ▶ Cash Flow
- ▶ Time
- ▶ Growth Rate

→ Time value of money concept.

1.4 Engineering Economy Principles

- ▶ **Principle 1** Generate alternatives.
- ▶ **Principle 2** Consider differences only.
- ▶ **Principle 3** Use the same perspectives for each alternatives.
- ▶ **Principle 4** Use the same unit of measurement.
- ▶ **Principle 5** Consider all relevant factors.
- ▶ **Principle 6** Conduct sensitivity analyses.
- ▶ **Principle 7** Continuous monitoring and improvement of decision.

1.5 Chapter Summary

- ▶ What is Engineering Economy?
- ▶ Importance of Engineering Economy to an engineer.
- ▶ The basic principles of engineering economy for decision making in engineering problems.