



**In this class,  
look for the answers to these questions:**

- Definition of economics
- What kinds of questions does economics address?
- What are the principles of how people make decisions?
- What are the principles of how people interact?
- What are the principles of how the economy as a whole works?

# Definition of Economics

- The word Economics is derived from the two Greek words “Oikos” – a house and “Nomos” – custom or law to manage. Meaning “managing a household”
- Economics is the study of how society manages its scarce resources

# Definitions

Adam Smith (1723 - 1790)- Father of Economics

- Book “An Inquiry into Nature and Causes of Wealth of Nations” (1776)
- Defined, “economics is the study of wealth” – “the practical science of production and distribution of wealth”
- In this definition wealth is given the first place and man is given the second place

# Science of welfare

Alfred Marshall (1842 - 1924) wrote a book “Principles of Economics” (1890)

- ◎ “Political Economy” or Economics is a study of mankind in the ordinary business of life;
- ◎ it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well being”.

# Science of Scarcity

- ◎ Lionel Robbins (Scarcity definition)
- ◎ “economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”
- ◎ Ends – human wants
- ◎ Means – resources with which wants are fulfilled

# Finally...

- **ECONOMICS** – is a **social science** that deals with how people organize themselves in order to allocate scarce resources in order to produce goods and services that will satisfy the unlimited and multiplying wants and needs of man.

# Economics

<b>Emphasis</b>	<b>Significant contribution</b>
Wealth	Adam Smith
Welfare	Alfred Marshall
Scarcity	Lionel Robbins

# Choices: three fundamental questions

- Given that wants > resources we need to allocate resources and make choices that maximise satisfaction.
- Scarcity results in **choices to be made**.
- Society must answer three fundamental questions when making choices/decisions:
  - a) **What goods and services will be produced?**
  - b) **How will the goods and services be produced?**
  - c) **Who will receive the goods and services produced?**
- Given a limited pool of resources, what should we do with those resources to ensure we are maximising



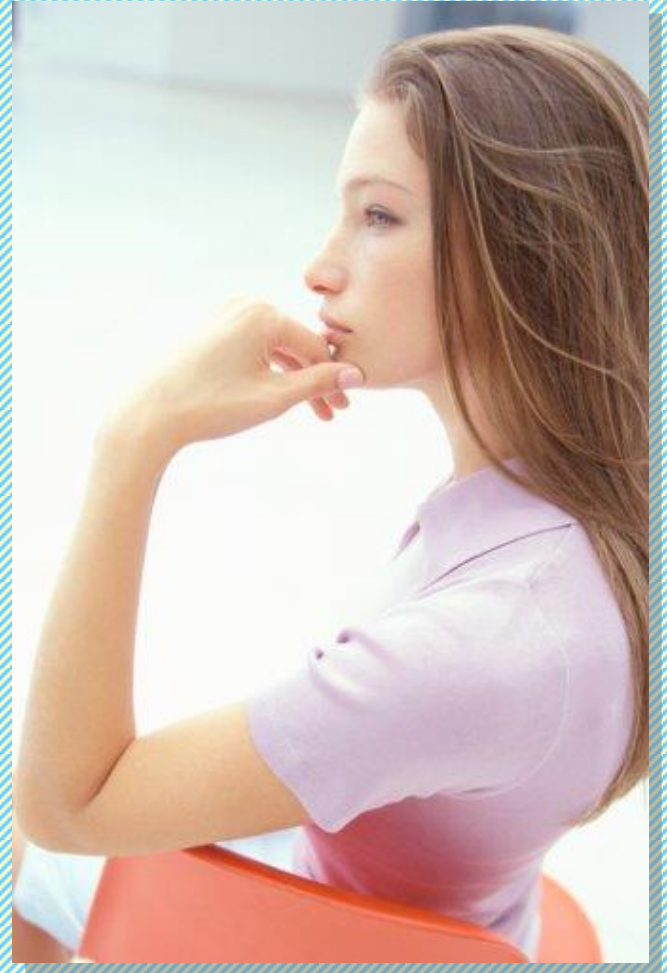
# Scarcity

- *Scarcity*. . . means that society has limited resources to meet unlimited wants
- Therefore cannot produce all the goods and services people wish to have.
  - Its impossible for all the wants to be met.
  - Economics, then, tries to solve the problem of scarcity

# What Economics Is All About

- **Scarcity**: the limited nature of society's resources
- **Economics**: the study of how society manages its scarce resources, e.g.
  - how people decide what to buy, how much to work, save, and spend
  - how firms decide how much to produce, how many workers to hire
  - how society decides how to divide its resources between national defense, consumer goods, protecting the environment, and other needs

*The principles of*  
**HOW PEOPLE  
MAKE DECISIONS**



# HOW PEOPLE MAKE DECISIONS

## Principle #1: People Face Tradeoffs

All decisions involve tradeoffs. Examples:

- Going to a party the night before your midterm leaves less time for studying.
- Having more money to buy stuff requires working longer hours, which leaves less time for leisure.
- Protecting the environment requires resources that could otherwise be used to produce consumer goods.

# HOW PEOPLE MAKE DECISIONS

## Principle #1: People Face Tradeoffs

- Society faces an important tradeoff:  
*efficiency vs. equality*
- **Efficiency**: when society gets the most from its scarce resources
- **Equality**: when prosperity is distributed uniformly among society's members
- Tradeoff: To achieve greater equality, could redistribute income from wealthy to poor. But this reduces incentive to work and produce, shrinks the size of the economic "pie."

# HOW PEOPLE MAKE DECISIONS

## Principle #2: The Cost of Something Is What You Give Up to Get It

- Making decisions requires comparing the costs and benefits of alternative choices.
- The **opportunity cost** of any item is whatever must be given up to obtain it.
- It is the relevant cost for decision making.

# HOW PEOPLE MAKE DECISIONS

## **Principle #2: The Cost of Something Is What You Give Up to Get It**

### Examples:

The opportunity cost of...

- ...going to college for a year is not just the tuition, books, and fees, but also the foregone wages.
- ...seeing a movie is not just the price of the ticket, but the value of the time you spend in the theater.

# HOW PEOPLE MAKE DECISIONS

## Principle #3: Rational People Think at the Margin

### Rational people

- systematically and purposefully do the best they can to achieve their objectives.
- make decisions by evaluating costs and benefits of **marginal changes** – incremental adjustments to an existing plan.



# HOW PEOPLE MAKE DECISIONS

## Principle #3: Rational People Think at the Margin

Examples:

- When a student considers whether to go to college for an additional year, he compares the fees & foregone wages to the extra income he could earn with the extra year of education.
- When a manager considers whether to increase output, she compares the cost of the needed labor and materials to the extra revenue.

# HOW PEOPLE MAKE DECISIONS

## Principle #4: People Respond to Incentives

- **Incentive:** something that induces a person to act, *i.e.* the prospect of a reward or punishment.
- Rational people respond to incentives.

Examples:

- When gas prices rise, consumers buy more hybrid cars and fewer gas guzzling SUVs.
- When cigarette taxes increase, teen smoking falls.

# *The principles of* **HOW PEOPLE INTERACT**



# HOW PEOPLE INTERACT

## Principle #5: Trade Can Make Everyone Better Off

- Rather than being self-sufficient, people can specialize in producing one good or service and exchange it for other goods.
- Countries also benefit from trade & specialization:
  - Get a better price abroad for goods they produce
  - Buy other goods more cheaply from abroad than could be produced at home

# HOW PEOPLE INTERACT

## Principle #6: Markets Are Usually A Good Way to Organize Economic Activity

- **Market:** a group of buyers and sellers  
(need not be in a single location)
- “Organize economic activity” means determining
  - what goods to produce
  - how to produce them
  - how much of each to produce
  - who gets them

# HOW PEOPLE INTERACT

## Principle #6: Markets Are Usually A Good Way to Organize Economic Activity

- A **market economy** allocates resources through the decentralized decisions of many households and firms as they interact in markets.
- Famous insight by Adam Smith in *The Wealth of Nations* (1776):  
Each of these households and firms acts as if “led by **an invisible hand**” to promote general economic well-being.

# HOW PEOPLE INTERACT

## **Principle #6: Markets Are Usually A Good Way to Organize Economic Activity**

- The invisible hand works through the price system:
  - The interaction of buyers and sellers determines prices.
  - Each price reflects the good's value to buyers and the cost of producing the good.
  - Prices guide self-interested households and firms to make decisions that, in many cases, maximize society's economic well-being.

# HOW PEOPLE INTERACT

## Principle #7: Governments Can Sometimes Improve Market Outcomes

- Important role for govt: enforce property rights (with police, courts)
- People are less inclined to work, produce, invest, or purchase if large risk of their property being stolen.



# HOW PEOPLE INTERACT

## Principle #7: Governments Can Sometimes Improve Market Outcomes

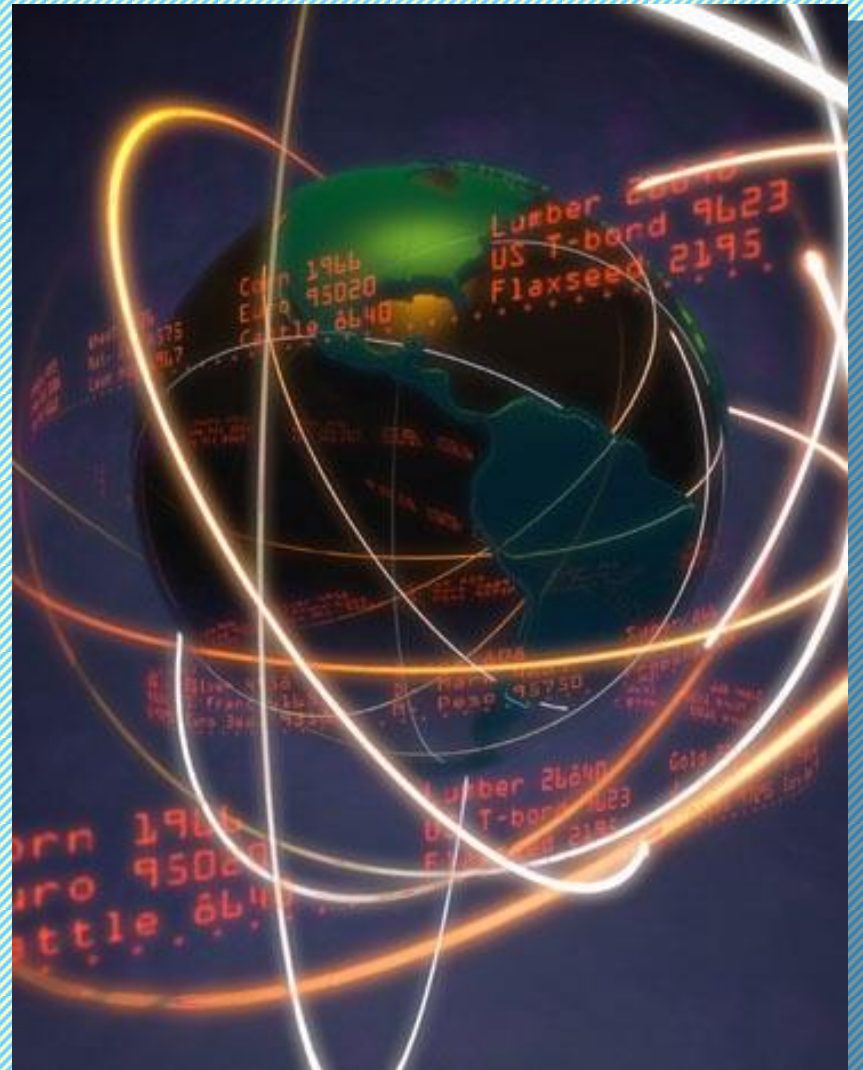
- **Market failure:** when the market fails to allocate society's resources efficiently
- Causes:
  - **Externalities**, when the production or consumption of a good affects bystanders (e.g. pollution)
  - **Market power**, a single buyer or seller has substantial influence on market price (e.g. monopoly)
- In such cases, public policy may [promote efficiency](#).

# HOW PEOPLE INTERACT

## Principle #7: Governments Can Sometimes Improve Market Outcomes

- Govt may alter market outcome to [promote equity](#)
- If the market's distribution of economic well-being is not desirable, tax or welfare policies can change how the economic “pie” is divided.

*The principles of*  
**HOW THE  
ECONOMY  
AS A WHOLE  
WORKS**



# HOW THE ECONOMY AS A WHOLE WORKS

**Principle #8: A country's standard of living depends on its ability to produce goods & services.**

- Huge variation in living standards across countries and over time:
  - Average income in rich countries is more than ten times average income in poor countries.
  - The U.S. standard of living today is about eight times larger than 100 years ago.

# HOW THE ECONOMY AS A WHOLE WORKS

**Principle #8: A country's standard of living depends on its ability to produce goods & services.**

- The most important determinant of living standards: **productivity**, the amount of goods and services produced per unit of labor.
- Productivity depends on the equipment, skills, and technology available to workers.
- Other factors (e.g., labor unions, competition from abroad) have far less impact on living standards.

# HOW THE ECONOMY AS A WHOLE WORKS

## **Principle #9: Prices rise when the government prints too much money.**

- **Inflation:** increases in the general level of prices.
- In the long run, inflation is almost always caused by excessive growth in the quantity of money, which causes the value of money to fall.
- The faster the govt creates money, the greater the inflation rate.

# HOW THE ECONOMY AS A WHOLE WORKS

## **Principle #10: Society faces a short-run tradeoff between inflation and unemployment**

- In the short-run (1 – 2 years), many economic policies push inflation and unemployment in opposite directions.
- Other factors can make this tradeoff more or less favorable, but the tradeoff is always present.

# Engineering Economics

- **Engineering economics** involves **formulating, estimating and evaluating** the expected outcomes of **alternatives** designed to accomplish a **defined purpose**.
- Mathematical techniques are used to simplify economic evaluation of alternative and these techniques are equally good for *individual, business or government projects*.
- *It offers an economic analysis tool for **making decisions***



# Engineering and Economics

- Technological developments for satisfying societal needs have been accepted as a way of life since the Industrial Revolution.
- A commitment to an engineering project usually represents the allocation of a substantial amount of societal resources for some expected social benefits.
- In this age of high-tech industries and keen international competition, the questions of where to build and when to build, and whether to build at all, become more important than ever.
- Engineering economic analysis is therefore to provide a basic understanding of the probable answers from an economic viewpoint to the questions of what to build, where to build, and when to build, or whether to build at all.

# Engineering and Economics

- The entire process of planning, design, construction, operation, and maintenance of engineering systems entails many important and often complex decisions.
- Both technological and economic considerations are essential in undertaking any new project requiring modern technology and involving a heavy commitment of resources
- A good understanding of the broad issues concerning the efficient utilization of resources and the impact of new technologies on society is essential in the strategic planning of engineering projects.
- The net present value method is recognized as the most direct and unambiguous basis in the evaluation of capital projects, the benefit-cost ratio method and the internal rate of return method are also extensively used in the Engineering decision making.

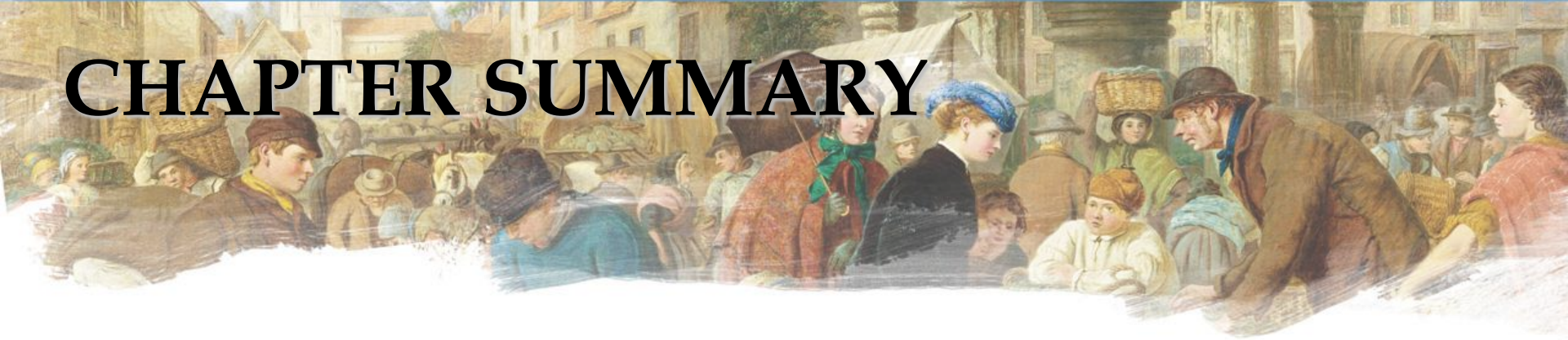
# Engineering and Economics

- The analytical techniques for the economic evaluation of engineering projects provide a solid foundation in the pursuit of benefit-cost analysis and financial management.
- The initiation of a new project follows the perception of human needs and desires in the society. An engineering system developed to satisfy such needs must pass tests of technological and economic feasibility under the prevailing institutional, social, and political conditions.
- First, an engineering system must be proved technologically feasible before anyone will commit resources to build it.
- Second, even if an engineering project is technologically feasible, it may not be worth building if the cost is prohibitively high compared to the benefit derived from the project.

# Microeconomics and Macroeconomics

- **Microeconomics** is the study of how households and firms make decisions and how they interact in markets.
- **Macroeconomics** is the study of economy-wide phenomena, including inflation, unemployment, and economic growth.
- These two branches of economics are closely intertwined, yet distinct – they address different questions.

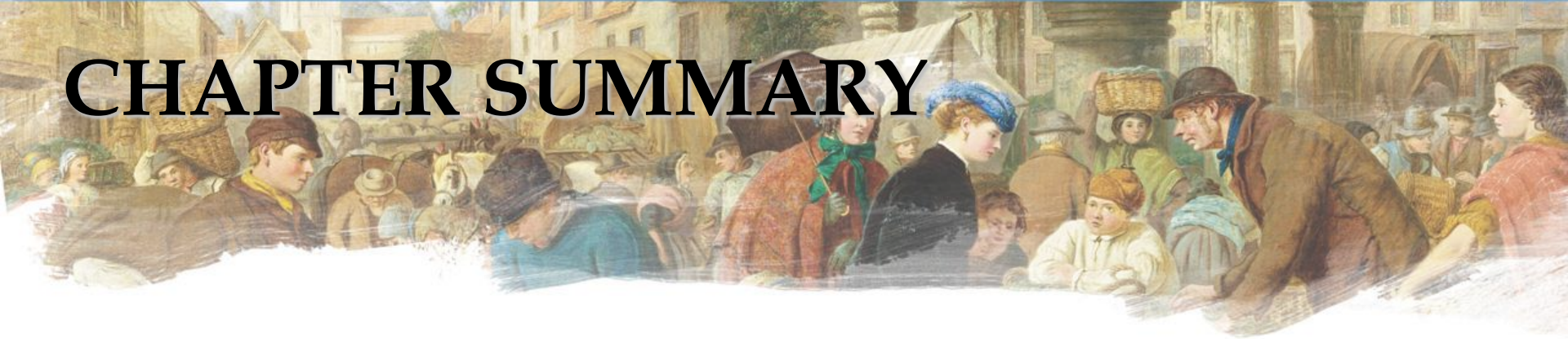
# CHAPTER SUMMARY



The principles of decision making are:

- People face tradeoffs.
- The cost of any action is measured in terms of foregone opportunities.
- Rational people make decisions by comparing marginal costs and marginal benefits.
- People respond to incentives.

# CHAPTER SUMMARY

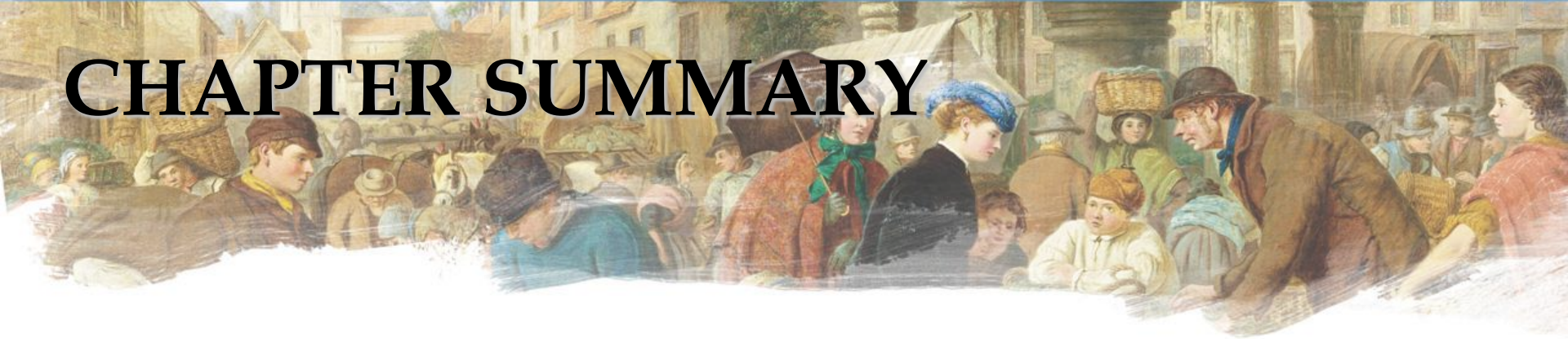


The principles of interactions among people are:

- Trade can be mutually beneficial.
- Markets are usually a good way of coordinating trade.
- Govt can potentially improve market outcomes if there is a market failure or if the market outcome is inequitable.



# CHAPTER SUMMARY



The principles of the economy as a whole are:

- Productivity is the ultimate source of living standards.
- Money growth is the ultimate source of inflation.
- Society faces a short-run tradeoff between inflation and unemployment.