

# Introductory Macroeconomics for Engineers

Instructor Name

Semester and Year

# Overview

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# Introduction

- Course Overview
- Objectives
- Grading

# Micro vs. Macro

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- **Why study macroeconomics?**

# Basic Concepts

## GDP - Overview

- **GDP (Gross Domestic Product)** measures the total value of all final goods and services produced within a country during a specific period.
- **Goods and Services:** "Goods" are tangible like shirts; "Services" are intangible like education.
- **Final Goods:** Only considers goods and services sold to end-users, excludes intermediate goods to avoid double counting.
- **Current Prices:** Values are based on prices during the period being measured.
- **Exclusions:** Does not account for home labor, or illegal activities.

# Basic Concepts

## GDP - Expenditure Approach

- GDP calculated as the sum of Consumption (C), Investment (I), Government Expenditures (G), and Net Exports (NX).
- **Net Exports (NX)** = Exports (X) - Imports (IM).
- **Why subtract imports?** We exclude imports because they are products produced outside the domestic economy.
- **Formula:**  $GDP_t = C_t + I_t + G_t + (X_t - IM_t)$



# Basic Concepts

## Real vs. Nominal GDP

- **Nominal GDP:** Measured in current prices, reflects price and quantity changes.
- **Real GDP:** Adjusted for price changes, provides a clearer measure of economic performance.
- **Example:** If 10 units of a good are produced at a price of \$1.50 each, Nominal GDP is \$15.00.
- **Calculating Real GDP:**  $\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Level}}$  focuses on quantity only.

# Understanding Economic Models

## What is a Model?

- A model is a **simplified representation** of a complex reality.
- Models help us understand, explain, and predict economic phenomena with a clear framework.
- **Purpose:** To abstract the complex real-world into manageable parts.

# Understanding Economic Models

## Why Use Models?

- **Conducting Experiments:** Models allow economists to conduct experiments that are not feasible in the real world.
- **Informing Policy:** Results from these experiments can guide policy-making decisions.
- **Exploratory Tools:** They help in exploring the outcomes of different economic scenarios and policies.

# Understanding Economic Models

## Testing Model Usefulness

- A model designed to explain phenomenon  $x$  can be tested by its ability to explain  $y$ , a related but untargeted phenomenon.
- **Test of Usefulness:** Whether it can illuminate aspects it was not specifically designed to explain.
- A model's inability to explain every aspect of reality is not necessarily a drawback.

# Understanding Economic Models

All Models are Wrong, But Some are Useful

- **Famous Adage:** All models are wrong, but some are useful.
- This phrase emphasizes that while no model can capture all aspects of reality, many provide significant insights and practical value.
- **Utility:** The best models are those that offer the greatest clarity and predictive power while acknowledging their limitations.

# History of Macroeconomics

## The Early Period: 1936-1968

- John Maynard Keynes published his seminal book during the Great Depression in 1936, sparking vast debates on his theories.
- John Hicks offered a graphical interpretation in 1937, popularizing Keynesian economic models for policy.
- Advancements in computational power in the 1950s allowed for the creation of complex statistical models by economists like Lawrence Klein, focusing on forecasting economic trends.
- The Klein and Goldberger model (1955) integrated dozens of equations, enabling dynamic predictions of economic responses to shocks.

# History of Macroeconomics

## The Phillips Curve and its Implications

- The Phillips Curve, introduced in 1958, illustrated a robust inverse relationship between inflation and unemployment rates.
- This relationship suggested that policymakers could manipulate monetary and fiscal policies to target specific inflation and unemployment rates.
- Milton Friedman critiqued this in 1968, arguing that such manipulation could lead to an inflationary spiral, challenging the sustainability of the Phillips Curve.

# History of Macroeconomics

Breakdown Era: 1968-1981

- The era highlighted the lack of microeconomic foundations in early Keynesian models.
- Robert Lucas's critique (1976) emphasized that models based on ad hoc macroeconomic relationships fail under policy changes due to the rational expectations of agents.
- This period saw the dismissal of simplistic Keynesian models, influenced further by economic stagnation during the 1970s.



# History of Macroeconomics

## Modern Macroeconomics: 1982-Present

- Introduction of Real Business Cycle theory by Kydland and Prescott in 1982, integrating microeconomic behaviors into macro models.
- Their model demonstrated how random technology shocks could drive business cycles, challenging earlier Keynesian views.
- Development of DSGE models that integrate rational expectations, optimizing behaviors, and acknowledge various market frictions.
- Current models blend insights from Keynesian approaches with new microeconomic foundations, shaping modern macroeconomic policy tools.