

Freshup Course

Introduction

- ▶ This course briefly recapitulates the required knowledge from Bachelor education in **mathematics**, **micro-** and **macroeconomics** which are essential for the master courses. In addition, some instructions and exercises regarding **academic writing** are provided.
- ▶ There are several functions of the course:
 - ▶ *Voluntary* freshup of your Bachelor knowledge and skills.
 - ▶ *Compulsory* course in case of a *conditional admission* to the master program.
 - ▶ Teachers do not need to recapitulate Bachelor stuff within master course lectures but can refer to the particular parts of the freshup course.
- ▶ Each part consists of a series of short **videos** and **Moodle quizzes**.
- ▶ In case that you do this course as a compulsory requirement, there will be an **exam** at the end of the winter semester. In case of fail, the exam can be repeated once.

Part I: Mathematics

Chiang, A., Wainwright, K. (2005), *Fundamental Methods of Mathematical Economics*, 4. ed., McGraw-Hill: New York.

Part II: Microeconomics

Varian, H. (2021), *Intermediate Microeconomics*, 9. ed, Norton.

Part III: Macroeconomics

Blanchard, O. (2020), *Macroeconomics*, 8. ed., Pearson.

Part IV: Academic Writing

Part I: Mathematics

1. Basic Operations, Series and Sequences
2. Linear Algebra
 - 2.1 Vectors and Matrices
 - 2.2 Determinant, Inverse and Eigenvalues
 - 2.3 Solving Linear Systems
3. Analysis
 - 3.1 Functions and Derivatives
 - 3.2 Total Derivatives and Taylor Approximation
 - 3.3 Concavity and Convexity
 - 3.4 Lagrange Optimization
 - 3.5 Integrals
4. Difference Equations
 - 4.1 Linear Difference Equations
 - 4.2 Intertemporal Optimization

Part II: Microeconomics

1. Theory of Firm
 - 1.1 Production functions
 - 1.2 Cost Minimization and Cost Function
 - 1.3 Profit Maximization and Supply
 - 1.4 Factor Demand
2. Theory of Household
 - 2.1 Representation of Preferences
 - 2.2 Household Optimum and Demand Function
 - 2.3 Elasticity and Homotheticity
 - 2.4 Income and Substitution Effect
 - 2.5 Labor Supply
 - 2.6 Intertemporal Consumption and Saving Decision

3. Markets

3.1 Perfect Competition

3.2 Monopoly

3.3 Monopolistic Competition

3.4 Oligopoly

4. Efficiency and Welfare

4.1 Transformation Curve and Technical Efficiency

4.2 Edgeworth Box and Pareto Efficiency

4.3 Consumer and Producer Surplus

4.4 Market Failure and Inefficiencies

- ▶ Market Power
- ▶ Externalities
- ▶ Information Asymmetries

Part III: Macroeconomics

1. Describing Economic States
 - 1.1 Nominal and Real GDP
 - 1.2 Balance of Payments
 - 1.3 Inflation Measurement
 - 1.4 Unemployment
2. Short Run
 - 2.1 Private Consumption
 - 2.2 Fisher Equation and Investment Demand
 - 2.3 Fiscal Policy
 - 2.4 IS Curve
 - 2.5 Money Supply and Money Demand
 - 2.6 Monetary Policy and LM Curve
 - 2.7 Comparative Static Analysis (IS-LM)

3. Medium Run

3.1 Wage/Price Setting and the Phillips Curve

3.2 Monetary Policy Rules and Comparative Static Analysis
(IS-LM-PC)

4. Open Economy

4.1 Exports and Imports

4.2 Exchange Rate Determination

4.3 IS-LM model for an Open Economy (Mundell-Fleming model)

5. Long Run: Solow Growth Model

Part IV: Academic Writing

1. Literature Search
2. Research question and structure
3. Writing style
4. Plagiarism and Citation
5. Formatting Guidelines and Formalities

Addendum: Methodological preliminaries

Final remark:

- ▶ A further chapter about **Statistics** might be added in the future.
- ▶ We expect a broader education in economics which might include also fields such like *Public Finance*, *Economic Policy*, *International Trade* and so on. But all these fields are to some extent based on micro- and macroeconomics. Therefore we insist on a sound education in these core fields.