

Economics Department**2021-2022 Past Courses****COMPULSORY COURSES**

Each teaching block is followed by exams – please see overview below:

Teaching Block I	Teaching Block II	Teaching Block III	Teaching Block IV
26 August - 8 November	10 November - 21 January*	25 January - 25 March	29 March - 27 May
Exam Week: 2-8 November	Exam Week: 17-21 January	Exam Week: 21-25 March	Exam Week: 23-27 May

Compulsory courses

These courses are compulsory for first-year research students. For each compulsory course there are additional exercise classes by teaching assistants.

The background course on Mathematics and the background course on Probability and Statistics run intensively in August and September, while the other compulsory courses (divided in 3 modules) run twice a week from early September till end of March. The Macroeconomics module will start in the second teaching block (in November) and continue until early June.

In addition, a 5-class methods course will run in Teaching Block IV in the Spring.

Overview

- [Outline of the Applied Economics and Econometrics sequence - compulsory and advanced courses](#)
 - [Outline of the Macroeconomics sequence - compulsory and advanced courses](#)
 - [Outline of the Microeconomics sequence - compulsory and advanced courses](#)
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Compulsory Courses

Courses for 1st year Economics researchers. If other researchers wish to attend, please contact the [Departmental Coordinator](#).

Teaching Block 1

- **Mathematics, (Antonio Villanacci) ECO-CO-MATH**

Credits: 1

Professor: Prof. Antonio Villanacci (Universita' degli studi di Firenze)

Content of the course

Linear algebra. Some topology in metric spaces. Differential calculus in Euclidean spaces. Nonlinear programming.

Reading material

Are Mandatory: Villanacci, A., (2016), Basic Linear Algebra, Metric Spaces, Differential Calculus and Nonlinear Programming, Class Notes.

students are supposed to have read and understood the content of Chapters 1, 2 and 3 and Sections 5.1, 5.2 before the beginning of the course.

Exercises

Students are strongly advised to do a large part of the following exercises; all the exercises are solved in some detail in the Öle listed below. a. exercises inserted at the end of almost all chapters or parts of the Notes; they are taken from Lipschutz (1991), Lipschutz (1965), handwritten Öle by Tito Pietra. b. Problem sets at the end of the Notes; c. past Önal exams.

Main sources of the Notes

I. Linear algebra Lang S. (1971), Linear Algebra, second edition, Addison Wesley, Reading. Lipschutz, S., (1991), Linear Algebra, 2nd edition, McGraw-Hill, New York, NY.

II Some topology in metric spaces.

Lipschutz, S., (1965), General Topology, McGraw-Hill, New York, NY. McLean, R., (1985), Class notes for the course of Mathematical Economics (708), University of Pennsylvania, Philadelphia, PA, mimeo. Ok. E. A., (2007), Real Analysis with Economic Applications, Princeton University Press, Princeton NJ. Simmons, G. F., (1963), Introduction to Topology and Modern Analysis, McGraw-Hill, New York. III Differential calculus in Euclidean spaces Apostol, T. M., (1974), Mathematical Analysis, 2nd edition, Addison-Wesley Publishing Company, Reading, MA. IV Nonlinear programming. Cass D., (1991), Nonlinear Programming for Economists, University of Pennsylvania, Class Notes.

Teaching and Review Sessions

The course is organized on 12 lectures and 5 review sessions. Review sessions will be devoted to the discussion and solutions of exercises. Class time will be organized as follows: 1 hour and 15 minutes class; 15 minutes break; 1 hour class.

Exam Requirements

There will be a final exam and 3 homework assignments. The final grade will be based on the final exam (90 per cent of the final grade) and on the problem sets (10 per cent of the final grade). The final exam will be open notes-open books

- **Background Course on Probability and Statistics, (Cristina Lafuente Martinez) ECO-CO-PROB**

Credits: 1

Professor: Prof. Cristina Lafuente Martinez (EUI)

Course objective

The main goal of this Core course is to give an introduction to the axiomatic foundations of probability theory and to the basics of univariate and bivariate statistics. The pre-course will consist of two parts of approximately equal size. The first part will focus on probability theory and will provide a mathematical structure for measures of uncertainty. In the second part the concept of random variables will be introduced and its properties will be discussed. Both parts will contain examples illustrating the basic concepts. There will be eight lectures and two exercise classes in this part.

Topics:

Topic 1

Introduction. Set theory. Basic probability theory. Probability axioms. Joint, marginal and conditional probabilities. Random variables. Probability density and cumulative distribution functions.
Casella and Berger, chapter 1

Topic 2

Expected values. Moments and moment generating functions. Transformations of random variables.
Casella and Berger, chapter 2

Topic 3

Specific densities: discrete and continuous.
Casella and Berger, chapter 3

Topic 4

Multivariate random variables. Joint and marginal distributions. Conditional distributions and independence of random variables. Covariance and correlation. The distribution of order statistics. Bivariate and multivariate normal densities. Conditional normal densities. Bivariate transformations of random variables. Law of Iterated Expectations.
Casella and Berger, chapter 4

Topic 5

Large sample theory. Sums of random variables, convergence concepts. Laws of large numbers. Central limit theorems. The delta method.
Casella and Berger, chapter 5

Exercise classes

There will be 2 exercise classes.

- **Statistics and Econometrics I: Regression Analysis, (Andrea Ichino) ECO-CO-STATS1**

Credits: 1

Professor: Prof. Andrea Ichino (EUI)

Course objective:

The main goal of this Core course is to give an introduction to the basic tools that an econometrician needs: the most popular estimation methods; inference and hypothesis testing; asymptotics; simple and multiple regression; instrumental variables.

In addition to the lectures there will be five exercise classes. Examples and applications will be used to illustrate the theoretical content of the course.

There will be 5 exercise classes.

Teaching material

- Richard J. Larsen and Morris L. Marx. An introduction to mathematical statistics and its applications. Prentice Hall, Fifth Edition, 2012.

- George Casella and Roger L. Berger. Statistical Inference. Thomson, Second Edition, 2002.

- Jeffrey Wooldridge, Introductory Econometrics. A Modern Approach. South Western Cengage Learning, 2009

- Joshua Angrist and Jorn-Steffen Pischke. Mostly Harmless Econometrics. An Empiricist's Companion. Princeton University Press, 2013.

- Lecture notes by the instructor.

Final exam and Grading

There will be two separate class room exams for Core 1A and Core 1B, but a single final grade based on:

- seven problem sets (two for Core 1A and five for Core 1B) that will count for 20% of the final grade;
- the exam for Core 1A will count for 20% of the final grade;
- the exam for Core 1B will count for 60% of the final grade.

- **Microeconomics I, (Laurent Mathevet) ECO-CO-MICRO1**

Credits: 1

Professor: Prof. Laurent Mathevet (EUI)

Course objective

The course will examine individual choices and economies where all markets are competitive. More specifically, in the first part of the course we will analyze the choice problem of consumers and firms and determine the properties of individual and aggregate demand functions. We will conclude the first part with an analysis of individual choices under uncertainty. In the second part of the course we will investigate first which economic outcomes, or allocations, are feasible in these economies, and which outcomes are efficient. Next, we will analyze the properties of the allocations attained as equilibria when consumers and firms can trade in competitive markets. If time will allow we will conclude extending the analysis to dynamic economies under uncertainty, where agents can also trade in competitive markets for financial securities.

Prerequisites:

You are expected to be familiar with the material covered in a standard intermediate microeconomics course (as in Varian, Intermediate Microeconomics (1999)).

Teaching method:

There will be fourteen one and a half hour lectures and seven exercise classes.

Teaching Block 2

- **Statistics and Econometrics II: Models for Micro Data, (Sule Alan and Thomas Crossley) ECO-CO-STATS2**

Credits: 1

Professor: Profs. Sule Alan and Thomas Crossley (EUI)

Course objective

The course is intended to introduce students to some standard methods specifically designed for the analysis of microeconomic data. The first half of the course covers methods for limited dependent variables, censoring, truncation and duration data, mostly by maximum likelihood. The 2nd half of the course covers methods for panel data (with a focus on linear models).

Final exam and Grading

- 6 problem sets will count for 30% of the final grade;
- A final exam will count for 70% of the final grade.

- **Macroeconomics I: Dynamic Fiscal and Monetary Policy (Russell Cooper) ECO-CO-MACRO1**

Credits: 1

Professor: Prof. Russell Cooper (EUI)

- **Microeconomics II, Game Theory (David Levine) ECO-CO-MICRO2**

Credits: 1

Professor: Prof. David Levine (EUI)

Course objective

The course is graded based on the final exam. There will be four problem sets that are not for credit, but several will be graded to provide feedback, and the answers will be reviewed in the TA sessions. The questions on the final exam will be chosen from the problem sets (although the numbers may be changed).

Teaching Block 3

- **Statistics and Econometrics III: Dynamics: Time Series and Simulation Based Estimators, (Russell Cooper) ECO-CO-STATS3**

Credits: 1

Professor: Prof. Fabrizia Mealli (University of Florence)

Course objective

This course will feature 10 2-hour lectures.

Grading

There will be final class room exam (project presentation) and take home assignments (simulation and real data exercises).

- **Macroeconomics II - part I: Dynamic Programming and Real Business Cycles, (Jesus Bueren) ECO-CO-STATS3**

Credits: 1

Professor: Prof. Jesus Bueren (EUI)

Course objective:

This course covers infinite-horizon optimization via dynamic programming (both deterministic and stochastic) as well as its application to some simple partial- and general-equilibrium models.

Topics covered:

- Equilibrium with complete markets (static exchange economies, exchange economies with infinitely lived agents –without and with uncertainty)
- Dynamic programming (sequential versus recursive formulation, the principle of optimality, the contraction mapping theorem, discrete state-space methods, neoclassical growth, recursive competitive equilibrium)
- Stochastic dynamic programming (RBC and Lucas-Tree models, the Permanent-Income Hypothesis, precautionary savings)

Grading:

Problem sets (10%) and final exam (90%)

- **Macroeconomics II - part II: New Keynesian Economics, (Edouard Challe) ECO-CO-MACRO2**

Credits: 1

Professor: Prof. Edouard Challe (EUI)

Course objective

This course introduces students to the New Keynesian model. It derives the New Keynesian Phillips curve from nominal rigidities and studies how it interacts with aggregate demand to jointly determine output, employment and inflation over the business cycle. It also covers various dimension of monetary policy, from its optimality to its implementation via simple policy rules.

Topics covered:

- Log-linearization of macroeconomic models
- The dynamic IS curve and the New Keynesian Phillips curve
- Monetary policy rules
- Optimal monetary policy under discretion versus commitment

Grading:

Problem sets (10%) and final exam (90%)

- **Microeconomics III (Zeinab Aboutalebi) ECO-CO-MICRO3**

Credits: 1

Professor: Prof. Zeinab Aboutalebi (EUI)

Course objective

This course is intended to introduce you to Economics of Information, Mechanism Design and Social choice Theory. The course has a principal text book and a recommended textbook. Each topic has Extra readings that are either articles that are particularly closely related to some of the material from class, or are books that are particularly useful for the topic. There will be a midterm exam (Date TBA) and a final exam (Date TBA), each worth 40% of your grade. Exercises will be assigned from time to time during class. It is in your interest to complete all the exercises as they are randomly marked by the class TA and contributes to 20% of your final grade. Solutions will be covered in the TA sessions . The extra readings are optional in the sense that you will not be tested on material that is not covered in class. In addition, the readings are quite difficult; so do not get discouraged if you find them so.

Grading

Weekly Problem sets: 20%

Midterm Exam (Date TBA): 40%

Final Exam (Date TBA): 40%

Teaching Block 4

- **Macroeconomics III - part I: Search Theory (Edouard Challe) ECO-CO-MACRO3**

Credits: 1

Professor: Prof. Edouard Challe (EUI)

Course objective

This course provides an introduction to Search theory and some of its applications to labor markets, monetary transactions, and asset markets. Students will learn how to characterise the behaviour of individual agents (e.g., job seekers) in a market with search frictions, and how these choices aggregate to determine (potentially inefficient) macroeconomic outcomes. Alternative price and wage setting mechanisms (i.e., posting versus bargaining) will be considered.

Topics covered:

- Basic job search
- Equilibrium search and endogenous wage dispersion
- Job creation and the Diamond-Mortensen-Pissarides model
- Competitive search
- Money search, OTC markets

Grading:

Problem sets (10%) and final exam (90%)

- **Macroeconomics III - part II: Incomplete Markets, (Alexander Monge-Naranjo) ECO-CO-MACRO3**

Credits: 1

Professor: Prof. Alexander Monge-Naranjo (EUI)

Course objective

This course covers the basic dynamic models of incomplete markets that must be familiar to all research economists, not just those doing macro. In the first lecture, we overview the different directions that we can take to incorporate contractual frictions and incompleteness in financial markets. In the following three lectures develop the baseline dynamic incomplete markets model. We start by characterizing the individual's optimization problems and then derive some of the key general equilibrium implications. We then sketch a few extensions, including models with aggregate fluctuations and models with equilibrium default. The ensuing three lectures and part of five, are devoted to recursive contracts in the presence of limited commitment or private information problems. Again, we discuss the implications for individual dynamics and for the cross-section of agents. A number of leading examples and applications will be used. If time permits, we will also discuss the design of optimal government policy, with and without commitment.

Topics covered:

- Sketch of computational methods
- Incomplete markets in GE: Aiyagari/Bewley/Huggett
- Incomplete markets with default
- One-sided limited commitment
- Two-sided limited commitment and moral hazard

Grading:

Problem sets (30%) and final exam (70%)