MASTER IN ECONOMICS AND FINANCE

The document presents the structure of the master program (and the professors in charge of each course) in 2014-2015. Courses, workshops, etc. are ordered primarily by the module at which they belong and secondarily by the term in which they take place:

PRELIMINARY MODULE

**Introductory Mathematics** (Juan Pablo Rincón)
This short course provides an overview of the mathematical methods commonly taught to economists at an undergraduate level.
Contents:
- Functions of real variable.
- Integration.
- Linear algebra.
- Functions of several variables.

**Introductory Statistics** (Laura Crespo, Luca Repetto)
This short course reviews the basic statistical notions commonly taught to economists at an undergraduate level.
Contents:
- Describing univariate distributions
- Describing multivariate distributions
- Distributions of sample statistics
- Using statistical methods in economic applications

MODULE I: CORE COURSES

**FIRST TERM**

**Mathematics** (Juan Romo)
This course provides a complete and rigorous review of the main mathematical methods used in economics.
Contents:
- Linear algebra.
- Mathematical analysis: continuity and differentiability.
- Static optimization theory.
- Dynamic analysis: differential and difference equations.
- Dynamic optimization theory.

**Microeconomics** (Guillermo Caruana)
This course studies the behavior of the fundamental microeconomic agents -consumers and producers- and revises the main results of competitive general equilibrium theory. Likewise, this course provides a rigorous introduction to game theory with complete information.

Contents:
- Consumer choice and demand theory.
- Production costs and supply theory.
- Competitive general equilibrium theory.
- Fundamental welfare theorems.
- Game theory with complete information.

**Statistical Methods in Econometrics** (Pedro Mira)
This course provides students with the required knowledge in statistics for econometric courses and for the topics with statistical content in other courses of the Program. This course reviews the basic concepts of probability theory, inference and asymptotic theory, with special reference to regression models.

Contents:
- Random variables and probability distributions.
- Multivariate random variables.
- Sample distributions.
- Estimations and hypothesis testing.
- Asymptotic theory.

**SECOND TERM**

**Uncertainty and Information** (Guillermo Caruana)
This course revises the main models of modern information economics, using the analysis of choice under uncertainty and game theory with incomplete information as a benchmark.

Contents:
- Theory of choice under uncertainty.
- Game theory with incomplete information.
- Adverse selection and signaling.
- Moral hazard, incentives and contracts.
- Mechanism design.
- Auctions.
Macroeconomics I (Josep Pijoan-Mas)
This course provides the student with a basic knowledge in macroeconomics through the analysis of the neoclassical growth model and its implications for aggregate allocations in the long run.
Contents:
- The neoclassical growth model.
- Multi-sector models and growth.
- Overlapping generations.
- Capital adjustment costs.
- A deeper focus on consumption.
- Money.

Econometrics (Ricardo Mora)
This course introduces the main models and methods for estimation and inference used in econometrics both for time series and for panel and cross-sectional data.
Contents:
- Regression analysis with time series.
- Simultaneity and errors in variables.
- Inference and estimation methods.
- Time series models.
- Panel data.
- Discrete choice.

MODULE II: ELECTIVE COURSES

THIRD TERM

Industrial Economics (Gerard Llobet)
After an introduction to the theory of the firm, this course analyzes the main models of Industrial Economics and their empirical applications.
Contents:
- Theory of the firm.
- Monopoly and price discrimination.
- Oligopoly.
- Product differentiation.
- Entry and exit.
- Switching costs and network externalities.
- Advertising.

Macroeconomics II (Claudio Michelacci)
This course expands the knowledge acquired in the Macroeconomics I course, extending the set of models and theories following recent developments in the discipline.
Contents:
- Endogenous growth models.
- Real business cycle models.
- Models with nominal price rigidities.
- Labor market models with search frictions.

**Time Series Econometrics** (Enrique Sentana)
This course studies econometric models for describing and predicting economic and financial time series, and analyzing the interrelations suggested by economic theory.
Contents:
- Univariate and multivariate time series.
- Unit roots and cointegration.
- Non-linear models.
- Inference with dependent observations.
- Specification tests.
- Dynamic regression models.

**Asset Pricing I** (Rafael Repullo)
This course analyzes the main models for the valuation of risky assets and their applications to different financial instruments.
Contents:
- The fundamental theorem of asset pricing.
- Portfolio selection theory.
- Static models of asset pricing.
- Intertemporal models of asset pricing.
- Pricing of derivatives.
- Pricing of fixed-income securities.
- Microstructure of financial markets.

**Corporate Finance** (Javier Suarez)
This course reviews the different theories on the determinants of firms’ financial decisions, most notably those concerning their financial structure as well as events such as mergers and acquisitions, and initial public offerings.
Contents:
- Modigliani-Miller irrelevance propositions.
- Theories based on taxes and financial distress costs.
- Theories based on conflicts of interest and agency problems.
- Asymmetric information theories.
- Payout policies.
- Mergers and acquisitions.
- Initial public offerings.
FOURTH TERM

Labor Economics (Manuel Bagues)
This course reviews the main models of the labor market and discusses related empirical evidence.
Contents:
- Labor supply.
- Labor demand.
- Unions and minimum wages.
- Human capital.
- Wage inequality.
- Gender inequality and discrimination.
- Family background and peer effects.

International Economics (Rosario Crinò)
This course reviews the main models of open economies, with special reference to the interactions between fiscal, monetary and exchange rate policies.
Contents:
- International trade.
- The current account and the real exchange rate.
- Nominal exchange rate determination in models with price rigidities.
- Exchange rate crises and international financial markets.

Microeconometrics (Manuel Arellano)
This course is concerned with econometric techniques for the analysis of micro data. Topics in both theoretical and applied econometrics are covered, with a view to illustrate the interaction between models, data, and methods.
Contents:
- Generalized method of moments.
- Panel data.
- Discrete choice.
- Duration models.
- Quantile methods.
- Selection and treatment effects.

Asset Pricing II (Enrique Sentana)
This course discusses the continuous-time asset pricing theory that is a prerequisite to understanding continuous-time derivative pricing models (such as the Black-Scholes model and more elaborate models). The course also covers applications such as the valuation of exotic options.
Contents:
- Asset pricing in discrete time: the binomial model.
- Some measure theory.
- Stochastic calculus.
- Continuous-time risk-neutral pricing.
- Forwards and futures.
- American derivative securities.
- Change of numeraire.

**Economics of Banking** (Javier Suarez)
This course focuses on understanding the role of banks in the markets for credit and liquidity. Starting with the industrial organization approach to banks, it covers contributions to financial intermediation theory based on information economics, as well as the analysis of the foundations and main tools for the micro- and macro-prudential regulation of banks.

Contents:
- The industrial organization approach to banks.
- Lender-borrower relationships and credit markets.
- Banks as delegated monitors.
- Banks as liquidity providers.
- The prudential regulation of banks.
- Systemic and macro-prudential aspects of banking.

**FIFTH TERM**

**Regulation and Competition Policy** (Gerard Llobet)
This course uses the analytical tools introduced in the Industrial Economics course to analyze regulation as a response to market failures and to assess competition policies.

Contents:
- Monopoly regulation.
- Liberalization of utility markets (electricity, telecommunications, etc).
- R&D policies: patents and innovation policies.
- Collusion.
- Vertical and horizontal integration.
- Abuse of dominant position.

**Development Economics** (Mónica Martínez-Bravo)
This course focuses on the understanding of the process of economic development. It reviews recent theoretical and empirical contributions of the literature on economic development. The course addresses why some countries are so much poorer than others, the main barriers to the process of economic development, and the reasons for the existence and persistence of these barriers.

Contents:
- Global trends in growth, development and poverty.
- Credit and insurance markets
- Health, nutrition, productivity.
- Education and human capital.
- Technical change and technology adoption.
- Institutions as a fundamental cause of long-run development.
- Corruption and local accountability.

**Quantitative Macroeconomics** (Josep Pijoan-Mas)
This course introduces the techniques of modern quantitative macroeconomics to study economies with income and wealth inequality. One important aspect of the course is the emphasis on learning how to solve these economies in the computer. As a practical application, we will study how to quantify the aggregate, distributional and welfare implications of different public policy reforms.

Contents:
- The neoclassical growth model with heterogeneous agents and incomplete markets.
- Numerical techniques for solving heterogeneous agents economies.
- Adding human capital investment.
- Endogenous market incompleteness and partial insurance.
- Evaluation of economic policy reforms: progressive taxation and Social Security.

**Topics in Empirical Economics** (Manuel Arellano, Pedro Mira, Diego Puga)
The purpose of this course is to present research strategies, models, and selected applications associated with three specific strands of work in contemporary applied research in economics.

Contents
- Evaluation of public policies
- Structural estimation of dynamic discrete choice model
- Cities and economic geography

**Risk Management** (Dante Amengual)
This course looks at the mitigation and management of risks from the perspective of a firm or a bank. It aims to provide a foundation in the technical tools used for hedging and financial risk analysis (e.g. VaR), and highlight some of the limitations of the state of the art. Particular emphasis is placed on interest rate risk and credit risk.

Contents:
- Constructing static and dynamic hedges in practice.
- Coherent risk measures.
- Modelling loss distributions.
- Models of interest rate risk.
- Models of credit risk.
MODULE III: INTRODUCTION TO RESEARCH

SECOND AND THIRD TERM

Applied Economics Workshop (Samuel Bentolila, Diego Puga)
The workshop has two main goals. First, to learn and to practice the techniques of an academic presentation. Second, to become acquainted with some of the methodological issues and the empirical evidence in different areas of Applied Economics. Each session consists of a couple of presentations by students, based on selected papers, followed by an informal discussion in class. Each session will be attended by the coordinator of the workshop and another faculty member whose area of expertise is close to the topic of the session.
Contents:
- Regulation in electricity markets.
- Transmission of monetary policy.
- Growth.
- Experimental economics.
- Natural experiments in labor economics.
- Intergenerational transmission of human capital.
- Economics of ageing.
- Corporate finance and investment.
- Business cycles and structural VAR’s.
- Industry entry models.
- Asset pricing.

FOURTH AND FIFTH TERM

Economic Policy Workshop (Samuel Bentolila)
The purpose of this workshop is to discuss some important economic policy issues using the tools of economic analysis provided in other courses. Each session will consist of two student presentations, based on the recommended readings as well as other relevant material, which either highlight different aspects of the topic at hand or defend conflicting views about it.
Contents:
- Evaluating development policy.
- Education policies.
- Labor market institutions.
- Financial regulation after the great recession.
- Intellectual property rights.
- The European sovereign debt crisis.
FIFTH AND SIXTH TERM

Master Thesis
The Master Thesis is an original research piece in the field chosen by the student. Each student is assigned an adviser who helps him or her in identifying a suitable research topic and oversees the whole process. In the course of their work on the thesis, students make two preliminary presentations. The first one is in February and consists of a presentation of the research project. The second takes place in May and allows students to present their first results. The Master Thesis defense takes place in a public session in June. This work is evaluated by the adviser and another examiner, and it is later graded in a plenary faculty meeting.