

Master Quantitative Economics

Master 2 track

Quantitative Economic Analysis

Compendium of syllabus

University Paris Dauphine - PSL

Academic year 2025-2026

Common warning about academic integrity

Be aware of the rules in Université Paris- Dauphine about plagiarism and cheating during exams. All work turned in for this course must be your own work, or that of your own group. Working as part of a group implies that you are an active participant and fully contribute to the output produced by that group. When you use the web, please state your sources.

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Overview of the curriculum

3 specialization fields : Economic Theory (ET) / Social and public policies (SPP) / Macro & Finance (MF)		
Semester 1		
Course	Hours in class	Nb of ECTS
(A) Quantitative courses (18 ECTS)		
<u>Mandatory, 12 ECTS</u>	-	-
Python for data science crash course	18	3
Introduction to matlab programming (*)	12	0
Machine Learning	36	9
<u>Optional Quantitative courses, 6 ECTS</u>		
<u>For the field MF</u>		
Advanced Macroeconometrics	18	3
Bayesian techniques in macroeconomics	12	3
<u>For the field SPP</u>		
Advanced Microeconometrics	27	6
<u>For the field ET</u>		
<u>Choose up to 2 courses for 6 ECTS</u>		
Advanced Microeconometrics	27	6
Advanced Macroeconometrics	18	3
Bayesian techniques in macroeconomics	12	3
<i>(*) Pre-requisite for the M2 direct entrance students who follow Advanced macroeconometrics and/or Empirical Industrial Organization</i>		
(B) Specialization courses (12 ECTS), Choose 4 courses		
<u>For the field MF</u>		
<u>Mandatory</u>		
Labor market, inequalities and macroeconomics	24	3
International trade, international macroeconomics	24	3
<u>Optional, choose 2 among</u>		
Quantitative International Trade	21	3
Asset pricing	30	3
Behavioral economics and bounded rationality	21	3
Environment and Sustainability	21	3
<u>For the field ET</u>		
<u>Mandatory</u>		
Advanced Game Theory	18	3
Behavioral economics and bounded rationality	21	3
Advanced Game Theory	21	3
<u>Optional, choose 1 among</u>		
Inequality and redistribution	21	3
Environment and Sustainability	21	3
Asset pricing	30	3

(B) Specialization courses (12 ECTS), Choose 4 courses		
<i>For the field SPP</i>		
Mandatory		
Inequality and redistribution	21	3
Health, welfare and health behavior	21	3
Labor, education and public policies	24	3
Optional, choose 1 among		
Advanced Game Theory	18	3
Experimental Economics	21	3
Behavioral economics and bounded rationality	21	3
Environment and Sustainability	21	3

Semester 2		
Course	Hours in class	Nb of ECTS
(A) Data science & economics, one to choose (3 ECTS)		
Machine Learning for Applied Economic Analysis	24	3
NLP for economic decisions	24	3
(B) Specialization courses (6 ECTS)		
For the field SPP, choose 2 courses among the 3		
Empirical Industrial Organization	21	3
Advanced Health Economics	18	3
Policies in developing countries	18	3
For the field ET		
Mandatory		
Empirical Industrial Organization	21	3
Elective, choose 1 course (3 ECTS)		
Natural gas economics	18	3
Computational social choice (**)	24	3
For the field MF, choose 2 courses among the 3		
Financial frictions in macroeconomics	18	3
Empirical Industrial Organization	21	3
Advanced Environmental Macroeconomics	15	3
(C) Prepare your job market insertion (21 ECTS)		
(a) Master thesis		15
(b) PhD proposal or Internship		6

(**) This course takes place rue de l'Estrapade, 75005 Paris

Semester 1 courses

A. Quantitative courses

Python for data science crash course

Instructor : Khalil EL MAHRSI

Contact Information : mohamed-khalil.el-mahrsi@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 18 h, 6 sessions of 3 hours per session

ECTS : 3

Mandatory course for all fields of specialization

Overview:

This is an introductory course that presents the basics of Python programming and gives an overview of the Python libraries that are commonly used for conducting data analysis and visualization tasks.

Prerequisites

Most of the course is self-contained, but you are expected to be familiar with mathematical tools associated to an economics curriculum (linear algebra, calculus, probability, and statistics) at an undergraduate level. The course does not assume any prior knowledge in programming in general and Python in particular. However, familiarity with another programming language can be useful in understanding the discussed concepts and topics.

Course Objectives:

By the end of this course, you will be able to:

- Write and understand entry-level to intermediate-level code in the Python programming language
- Use NumPy for scientific computing and efficient manipulation of multi-dimensional arrays and matrices
- Use pandas to load, manipulate, and analyze tabular data
- Use Matplotlib and seaborn to visualize data

Course Schedule

1	Introduction to Python Programming This first part introduces the fundamentals of Python programming. It covers topics such as working with basic built-in types (numbers, strings, booleans, ...), control flow statements, writing reusable code (functions), handling errors and exception that can occur during the execution of Python code, advanced data structures (lists, sets, dictionaries, ...), ...
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2	Scientific Computing With NumPy This part focuses on using NumPy, a scientific computing package that provides a wide assortment of useful and highly-optimized routines for working with multi-dimensional arrays (matrices, tensors, ...), linear algebra, statistics and random simulation, and much more.
3	Processing Tabular Data With pandas The third part of the course is dedicated to pandas, a fundamental Python package when it comes to data science and data analysis. pandas provides functionalities for efficient manipulation of data frames, i.e., tabular data (stored in csv files, Excel sheets, ...). With the help of pandas, you can easily conduct tasks such as data cleaning (filling missing data, replacing outliers, ...), reshaping, merging, ...
4	Visualizing Data With Matplotlib and seaborn The last part of the course is a quick introduction to data visualization functionalities in Python using the Matplotlib and seaborn packages. Data visualization is a very powerful tool for making sense of large volumes of data, identifying patterns, and extracting useful insights that can help understand and solve real-world business cases.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **No**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Mode of Assessment

You will be evaluated based on a team project (conducted in pairs) in which you will apply the knowledge and skills you acquired during the course. The project takes the form of an exploratory data analysis in which you will work on a tabular data set in order to extract valuable insights that can help solve a business problem.

The expected deliverables of the project are:

- A 5–10 pages report ;
- The source code (Jupyter notebooks or Python scripts) of your work, either in a Github repository or as a zip file.

You are expected to present your main findings during a 10-minutes presentation, which will be followed by approximatively 5 minutes of questions.

Class participation: Encouraged

Exam policy: written report and source code (50%) and oral presentation (50%).

Introduction to Matlab programming

Instructor: Julia Schmidt, Université Paris Dauphine-PSL

Contact Information : julia.schmidt@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 12h, 4 sessions of 3 hours per session, over 2 weeks

Elective course: Pre-requisite for the M2 direct entrance students who follow Advanced macroeconometrics and Empirical Industrial Organization

ECTS : No ECTS is attached to the course, but it is a **pre-requisite for the M2 direct entrance students who follow Advanced macroeconometrics and/or Empirical Industrial Organization. Attendance in class is mandatory to all these students.**

Other interested students in the field MF can attend this course, depending on the total capacity constraint. **The request should be made to the Master's director before summer.**

Overview:

This an intensive crash course introducing the basics of MATLAB programming. MATLAB (the name stands for: Matrix Laboratory) is a high-performance programming language and a computing environment that uses vectors and matrices as one of its basic data types (MATLAB is a registered trademark of the MathWorks, Inc.). It is a powerful tool for mathematical and technical calculations, and it can also be used for creating various types of plots.

Prerequisites : There is no prerequisite.

Course Objectives:

The first set of lectures are devoted to the introduction of standard programming such as mathematical operations, matrix creation and manipulation. The course then focuses on coding of loops and conditional statements. Next, the course introduces the concept of functions. The course ends with a presentation of optimization methods and solvers.

Course Schedule

1	Introduction to MATLAB programming: - Installation and presentation of the commands - Manipulation of vectors, matrices, and mathematical operations
2	Creation of plots: - Plot 2D and 3D graphics - Present and exports graphs from MATLAB
3	Conditional statements and loops: - Understand and implement conditional statements - Code loops
4	Functions: - Create functions with multiple input arguments or/and multiple output variables - Introduction to optimization methods

Readings

The course is based on the material Gauthier Vermandel for his lecture “[Introduction to Finance with MATLAB](#)”.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

Class participation: More than encouraged

Machine Learning

Instructor : Fabrice Rossi (Université Paris-Dauphine & PSL Research University, CEREMADE)

Contact Information : fabrice.rossi@dauphine.psl.eu

Information on the course

Master 2, Semester 1

Course Load: 36h

ECTS: 6

Mandatory course for all fields of specialization

Overview

This course provides a thorough introduction to machine learning with a focus on supervised learning and predictive models, and as well as an introduction to unsupervised learning. The first part of the course is dedicated to an introduction to supervised learning, i.e., situations in which a predictive model has to be constructed from a data set. This part introduces simple machine learning algorithms (k nearest neighbors and decision trees) and contrasts them with the standard linear model (used in e.g. econometrics). The key concepts of generalization and overfitting are presented, together with the resampling techniques used to properly tune complex models. The second part of the course focuses on advanced supervised learning methods based on ensemble methods (random forests and boosting). It includes also an introduction to empirical risk minimization and to its variations, with a brief incursion in the deep learning territory. The complex setting of unbalanced data is also covered in this second part. Finally, the third part of the course is dedicated to unsupervised methods, with a particular focus on clustering techniques and on dimensionality reduction methods. Other aspects of unsupervised learning, such as frequent pattern mining and outlier detection are also discussed.

Course Objectives

The objective of the course is to introduce machine learning methods adapted to medium size data sets. The course is an applied one: all the methods are illustrated on real world data sets using R and python with their machine learning libraries and packages. After attending the class, the students will know the main innovative techniques for the processing of medium size data sets and how to implement supervised machine learning, in view of applying these techniques to several economic issues.

Prerequisites :

Mathematics and optimization, Statistics and probability; Practice of Python or R programming at introductory level.

Mode of Assessment

The final grade will be made of two types of grading: A continuous assessment grade, made mostly of grades obtained to quizzes and programming tests (approximately 50 % of the grade) and integrating oral participation during the class and regular attendance; A grade obtained on a machine learning project (preferably done in groups of 2 students).

Course Schedule

Readings

- An introduction to statistical learning (<https://trevorhastie.github.io/ISLR/>)
- Probabilistic Machine Learning: An Introduction (<https://probml.github.io/pml-book/book1.html>)
- Tidy Modeling with R (<https://www.tmw.r.org/>)

Moodle

This course is on Moodle : **Yes**

Advanced Macroeconometrics

Professor:

Fabien Tripier (Université Paris Dauphine, LEDa & PSL Research University)

Contact Information : fabien.tripier@dauphine.psl.eu

Information on the course :

Semester 1

Course load: 18 hours, 6 sessions of 3 hours per session

ECTS : 3

Mandatory for the field MF; elective for the field ET

Prerequisites

Master 1 courses: Macroeconomics, Macroeconometrics, Statistical & Mathematical tools

Overview:

This course provides advanced econometrics tools for applied macroeconomics. The identification of causal relationships in macroeconomics will be the key theme of the course. Identifying causal relationships is necessary to understand the origin of economic fluctuations and to evaluate the relevance of the mechanisms proposed by the various economic theories. Identifying causality requires isolating an exogenous component in macroeconomic data, called shocks, and then inferring its macroeconomic effects through relevant econometric tools. The course will focus on the following tools: structural vector auto-regressive models, narrative and high-frequency identification and local projections methods. These methods will be mainly applied to the analysis of monetary and fiscal economic policies and the links between the business cycle and financial markets.

Course Objectives:

The objective of the course is to provide students with the econometric background necessary for an in-depth understanding of the results presented in recent scientific articles and for the realization of a personal economic analysis using the usual macroeconomic tools.

The course provides applications of econometrics tools using STATA routines and Matlab Toolboxes.

Targeted competencies

After having attended the classes, the students will be able to (i) apply time series tools to compose the cycle and trends in time series, (ii) to identify shocks and their economic effects using various techniques, (iii) to interpret the results considering macroeconomic theory, and (iv) to perform these empirical applications while understanding the underlying analytics of econometric tools.

Mode of Assessment

Project: Mini-project, written test and active participation in class

Course Schedule

1	Identifying the Business Cycles
2	Shock Identification with Structural VARs
3	Non-linear Structural VARs
4	Local Projection Methods versus SVAR
5	Non-linear Local Projection Methods
6	Narrative and High-Frequency Identification Methods

Readings

Canova, F. (2011). Methods for applied macroeconomic research. Princeton university press.
 Canova, F., Ferroni, F. (2020). A hitchhiker guide to empirical macro models, documentation for the empirical macro toolbox <https://sites.google.com/view/fabio-canova-homepage/home/empirical-macro-toolbox>
 Cochrane, J. H. (2005). Time series for macroeconomics and finance. Manuscript, University of Chicago, 1-136.
 Hamilton, J.D. (1994). Time Series Analysis. Princeton University Press.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

Mini-project: Students must select an article published in a top journal using one of the methods presented in the course. It is advisable to choose an article for which replication files are available online. The students will then replicate one of the main results of the article and perform a robustness analysis by modifying an element of the analysis that could concern for example the data used or the econometric tool used. The results will be presented and analysed in a short report written in LaTeX that supplements the codes written by the students.

Test: A multiple-choice test will be given to check knowledge of key course concepts.

Final grade: Mini-project (75%) and test (25%)

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Bayesian techniques in macroeconomics

Instructor : To be defined

Contact information : To be defined

Information on the course :

Master 2, Semester 1

Course load: 15h, 5 sessions with 3 hours per session

ECTS : 3

Mandatory for the field MF; elective for the field ET

Overview:

The lectures provide a self-contained introduction to the building, simulation and estimation of the Dynamic Stochastic General Equilibrium models that constitute the main workhouse of today's financial macroeconomics. These models, which incorporate micro-foundations, dynamic relations and rational expectations in a macroeconomic framework, have now become a powerful tool used in central banks for policy projections. The course will present the recent developments in Bayesian econometrics that are commonly used to estimate these models. After recalling the standard VAR (Vector Autoregressive) model *à la* Sims (1980), the course will present the Bayesian VAR model *à la* Sims & Zha (1998). These class of atheoretical models is then compared to theoretical DSGE models *à la* Smets & Wouters (2003, 2007).

Prerequisites

A solid background in both microeconomics and macroeconomics is a prerequisite. A background in Econometrics (time series + VAR models) and MATLAB programing are a plus but not compulsory.

Course Objectives:

The objective of the course is to equip the students with the more advanced estimation techniques of macroeconomic models. It will provide the most up-to-date tools to allow the students to get a deep knowledge of these models and to be able to read and understand policy and research papers using these approaches.

After having attended the classes, the students will master the up-to-date estimation techniques of the macroeconomic models which are now employed in policy institutions such as the ECB, the Banque de France or the IMF. Using the estimated models, students will be able to perform business cycles analysis (variance decomposition, inspecting propagation mechanisms, variance forecast error decomposition), as well as forecasting exercises using both VAR, B-VAR and DSGE models. These types of skills are typically required in a growing number of policy-making institutions.

Mode of Assessment

To be defined soon

Course Schedule

1	AR, VAR and B-VAR Models. Constructing a likelihood function to estimate a state-space model. Use priors to penalize the likelihood function.
2	Solution methods and simulations for DSGE models. Linearization and Perturbation methods.
3	Estimation of the workhorse New Keynesian Model. Kalman filter, prior setting, posterior reading, Metropolis-Hasting algorithm.

4	Applications
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Readings

Articles:

An, S., & Schorfheide, F. (2007). Bayesian analysis of DSGE models. *Econometric reviews*, 26(2-4), 113-172.

Sims, C. A., & Zha, T. (1998). Bayesian methods for dynamic multivariate models. *International Economic Review*, 949-968.

Smets, F., & Wouters, R. (2003). An estimated dynamic stochastic general equilibrium model of the euro area. *Journal of the European economic association*, 1(5), 1123-1175.

Textbooks:

Galí, J. (2015). *Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications*. Princeton University Press.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: To be defined soon

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Class participation: Active class participation – this is what makes classes lively and instructive.

Exam policy: To be defined soon

Advanced microeconometrics

Professor:

Eric Bonsang (Université Paris-Dauphine, LEDa & PSL Research University)

Contact Information

Eric Bonsang: eric.bonsang@dauphine.psl.eu

Information on the course :

Semester 1

Course load: 27h, 9 sessions (3 hours per session)

ECTS: 6

Mandatory course for the field SPP, elective for the field ET

Overview:

This course explores different topics in applied microeconometrics at advanced level for public policy evaluation. It focuses on causal inference and how econometrics can help identify causality. It discusses the advantages and limitations of particular types of approaches/tools that are used in econometrics. It covers the following topics: Causal inference and identification, Randomized experiment, Regression and causality, Instrumental variables approach and Regression discontinuity designs. The course will

review the theory underlying those different techniques and will discuss the recent studies that have applied these methods to make causal inference.

Prerequisites

Master 1 Course: Microeconometrics

Course Objectives:

The objective of the course is to provide students the econometric methods aiming at identifying causal relationships. These methods are widely applied in economics to assess the effects of policy interventions and other treatment on interest. After attending the classes, the students will be able to have a deep understanding and a critical view on studies aiming at identifying causal effects and to apply those methods for their own research.

Mode of Assessment

Written exam (70%) + Short empirical paper (20%) + Active participation in class (10%)

Course Schedule

1	Causal inference and identification/ Randomized experiment
2	Regression and causality
3	Instrumental variables methods
4	Instrumental variables methods with heterogeneous effects
5	Instrumental variables methods for nonlinear models
6	Regression discontinuity designs
7	Applications with Stata 1
8	Applications with Stata 2
9	Presentation of the short empirical papers by the students

Readings

Mostly Harmless Econometrics, Joshua Angrist and Jörn-Steffen Pischke
Econometric Analysis of Cross-section and Panel Data, Jeffrey Wooldridge
Microeconometrics. Methods and Applications, A. Colin Cameron and Pravin K. Trivedi

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Class participation: Active class participation – this is what makes classes lively and instructive. Come on time and prepared.

Exam policy: In the exam, students will not be allowed to bring any document (except if allowed by the lecturer). Unexcused absences from exams or failure to submit cases will result in zero grades in the calculation of numerical averages. Exams are collected at the end of examination periods.

B. Specialization courses

Labor market, inequalities and macroeconomics

Instructors: Selma MALMBERG, CEPREMAP, and Arthur POIRIER, Université Paris Dauphine-PSL, LEDa

Contact Information

Selma MALMBERG : selma@dynare.org

Arthur POIRIER : arthur.poirier@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 24 hours, 8 sessions and of 3 hours per session

ECTS : 3

Mandatory for the field MF

Overview:

Understanding the behavior of the labor market is key to understanding macroeconomics. Behind well-known aggregates such as unemployment, employment rate, and concepts like inequality lie complex interactions among workers, firms, and policymakers. The aim of this course is to provide students with the necessary tools to understand these mechanisms.

The course is organized as follows. First, it addresses key stylized facts and current challenges facing the labor market. Then, it explains how macroeconomic labor market models are built and how they help disentangle labor market mechanisms. Finally, the course emphasizes how extended models can account for heterogeneity.

Prerequisites

- Economics of growth (M1 – S1)
- Business cycles analysis (M1 – S2)
- Knowledges in modelling and basic mathematics (function, derivation, differential equations, matrices)
- Knowledge in computational methods (Matlab, Python or, R) can be useful.

Course Objectives:

The aim of this course is to provide students with the necessary theoretical and computational tools to replicate the main stylized facts of the labor market. By the end of the course, students will be able to use and simulate models and compare their predictions with empirical data. They will also be able to assess the effects of labor market policies.

Mode of Assessment

The assignment consists of an oral and written presentation, including the replication and, if applicable, the extension of a research paper.

Course Schedule

Sections 1-3 (Households, 12 hours) Section 4-6 (Workers and Firms, 12 hours)

1	Introduction to heterogeneity in macroeconomics
2	How to solve a Heterogeneous Agents model
3	Macroeconomic Consequences of Heterogeneity
4	Labor market stylized facts and challenges
5	Search and matching models
6	Heterogeneities in the labor market.

Readings

Heterogeneous agents

Auclert, A., Bardóczy, B., Rognlie, M., & Straub, L. (2021). Using the sequence-space Jacobian to solve and estimate heterogeneous-agent models. *Econometrica*, 89(5), 2375-2408.

Carroll, C. D. (2006). The method of endogenous gridpoints for solving dynamic stochastic optimization problems. *Economics letters*, 91(3), 312-320.

Kaplan, G., Moll, B., & Violante, G. L. (2018). Monetary policy according to HANK. *American Economic Review*, 108(3), 697-743.

Krusell, P., & Smith, Jr, A. A. (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of political Economy*, 106(5), 867-896.

Labor market flows

Cahuc, Pierre, Stéphane Carcillo, and André Zylberberg. *Labor economics*. MIT press, 2014.

Elsby, Michael W. L., Ryan Michaels, and Gary Solon. "The ins and outs of cyclical unemployment." *American Economic Journal: Macroeconomics* 1.1 (2009): 84-110.

Elsby, Michael WL, Bart Hobijn, and Ayşegül Şahin. "Unemployment Dynamics in the OECD." *Review of Economics and Statistics* 95.2 (2013): 530-548.

Elsby, Michael WL, Bart Hobijn, and Ayşegül Şahin. "On the importance of the participation margin for labor market fluctuations." *Journal of Monetary Economics* 72 (2015): 64-82.

Shimer, Robert. "Reassessing the ins and outs of unemployment." *Review of Economic Dynamics* 15.2 (2012): 127-148.

Labor search and matching

Cahuc, Pierre, Stéphane Carcillo, and André Zylberberg. *Labor economics*. MIT press, 2014.

Mortensen, Dale and Christopher Pissarides (1994). "Job Creation and Job Destruction in the Theory of Unemployment" Review of Economic Studies Vol 61, pp 397-416.

Pissarides, Christopher A. Equilibrium unemployment theory. MIT press, 2000.

Rogerson, Richard, Robert Shimer, and Randall Wright. "Search-theoretic models of the labor market: A survey." Journal of economic literature 43.4 (2005): 959-988.

Shimer, Robert. "The cyclical behavior of equilibrium unemployment and vacancies." *American economic review* 95.1 (2005): 25-49.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Class participation: Active class participation – this is what makes classes lively and instructive.

Exam policy: The final grade for this course will be based entirely (100%) on an oral presentation and a written analysis. Each student is required to present, replicate and possibly extend a selected academic article and submit an accompanying written analysis. Both components will be evaluated for clarity, depth of understanding, and critical thinking with the article's content.

International trade, international macroeconomics

Professors: Lise Patureau, Université Paris Dauphine-PSL, LEDa and Gianluca Orefice, Université Paris Dauphine-PSL, LEDa

Contact Information

Gianluca Orefice: gianluca.orefice@dauphine.psl.eu

Lise Patureau: lise.patureau@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 24h, 8 sessions, 3 hours each

ECTS : 3

Mandatory for the field MF

Overview:

The course is a topics course on international trade and macroeconomics, which covers the recent advances in international trade and macroeconomics with an emphasis on the role of firm heterogeneity. Starting from recent models of international trade with heterogeneous firms (Melitz 2003; Chaney 2008) and its effects on the labor market, the course will rely on the theoretical modelling of the New Open Economy Macroeconomy framework (Obstfeld & Rogoff, 1995), which embeds explicit

microfoundations in a dynamic general equilibrium perspective. The first part of the course will provide students with the essential tools to study the optimal international strategy of firms with different levels of productivity. The second part of the course studies the recent advances in international macroeconomics that incorporate these elements from the international trade literature, by modeling the role of the extensive margin of trade à la Melitz (2003) in an international macroeconomic setting.

Prerequisites

International Trade, Macroeconomics at the Master 1 level, macroeconometrics

Course Objectives:

The objective of the course is to introduce some key topics of interest in the field of international trade and international macroeconomics and to provide students with the modelling framework to address them. A specific focus will be made on the role of firm heterogeneity in shaping international trade flows as well as macroeconomic fluctuations in an international set-up. The students will be trained to read leading research articles on these issues.

After attending the classes, the students will have a sharp understanding of the optimal international strategy of firms, and how such trade microfoundations shed new light on long-standing or novel questions in international macroeconomics. They will also master the cutting-edge research at the frontier between international macroeconomics and international trade, and how to think about economic policy in this global framework.

Course Schedule

	<i>Part 1 – The New New Trade Theory and the Heterogeneity of firms</i>
1	International Trade with Heterogeneous Firms (Melitz 2003)
2	FDI with Heterogeneous Firms: Helpman, Melitz and Yeaple (2004)
3	Trade Liberalization, Labor Market, Homogeneous Firms (Trefler 2003, Kovak 2013)
4	Liberalization, Labor Market, Heterogeneous firms (Helpman and Itskhoki 2010)
	<i>Part 2 – International Macroeconomics</i>
5	The canonical model of international business cycles (1)
6	The canonical model of international business cycles (2)
7	Firm heterogeneity, firm dynamics and international fluctuations
8	Trade, granularity and international business cycles

Readings

There is no textbook for this course. We will base it entirely on published academic papers, based on the (yet non-definitive) list of papers.

Common core papers

- Melitz, M. (2003) “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity”, *Econometrica* 71: 1695-1725 (compulsory reading).

Part I: International trade

- Brainard, S.L. (1997) “An Empirical Assessment of the Proximity- Concentration Trade-off Between Multinational Sales and Trade,” *American Economic Review*, 87(4), pages 520-544 (suggested reading)
- Melitz, M., Helpman, H. and S. Yeaple (2004) “Export Versus FDI with Heterogeneous Firms”, *American Economic Review* 94: 300-316 (compulsory reading).
- Pavcnik (2002) “Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants”, *The Review of Economic Studies* 69, January 2002, pp. 245-76 (suggested reading).
- Trefler D. (2004) “The Long and Short of the Canada-U.S. Free Trade Agreement”, *American Economic Review* 94: 870-895 (compulsory reading).
- Helpman H. and Itskhoki (2010) “Labour Market Rigidities, Trade and Unemployment”, *Review of Economic Studies*, 77(3): 1100-1137 (compulsory reading).
- Kovak, B. (2013) “Regional Effects of Trade Reform: What is the Correct Measure of Liberalization”, *American Economic Review*, 103(5): 1960-1976 (compulsory reading).
- Autor D., Dorn D., and G. Hanson (2013) “The China Syndrome: Local Labor Market Effects of Import Competition in the United States”, *American Economic Review*, 2013, 103(6), 2121–2168 (compulsory reading).
- Kovak, B and R. Dix-Carneiro (2017) “Trade Liberalization and Regional Dynamics”, *American Economic Review*, 107(10): 1908-2946 (suggested reading).

Part II: International Macroeconomics

The canonical model of international business cycles

- Backus, David K.; Kehoe, Patrick J.; Kydland, Finn E. (1995), "International Business Cycles: Theory and Evidence", in Cooley, Tom (ed.), *Frontiers of Business Cycle Research*, Princeton University Press
- The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?, Maurice Obstfeld, Kenneth Rogoff. in *NBER Macroeconomics Annual 2000*, Volume 15, Bernanke and Rogoff. 2001

Firm heterogeneity, firm dynamics and international fluctuations

- Ghironi, Fabio, and Marc Melitz. 2005. “International Trade and Macroeconomic Dynamics with Heterogeneous Firms.” *Quarterly Journal of Economics* 120: 865-915

Trade, granularity and business cycles

- The Micro Origins of International Business-Cycle Comovement, Julian di Giovanni, Andrei A. Levchenko and Isabelle Mejean, *American Economic Review*, Vol 108, 2018
- "Large Firms and International Business Cycle Comovement", 2017, *American Economic Review P&P*, 107(5):598-602, J. di Giovanni, A. Levchenko and I. Méjean
- The network origins of aggregate fluctuations, 2012, Acemoglu, D., Carvalho, V.M., Ozdaglar, A. and Tahbaz-Salehi, A., *Econometrica*, Vol. 80, n°5
- Gabaix, X., 2011, The granular origins of aggregate fluctuations, *Econometrica*, Vol. 79, n°3

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty’s recommended grade distribution.

Mode of Assessment

Final grade: 100%

The final grade will be based on a written final exam, covering both parts of the course. It will be a closed-book exam.

Class participation: Active class participation – this is what makes classes lively and instructive. Come on time and prepared.

Quantitative International Trade

Professor: Farid Toubal, University Paris Dauphine – PSL, LEDa

Contact Information : farid.toubal@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 21h, 7 sessions of 3 hours per session

ECTS : 3

Elective course for the field MF

Overview:

This lecture covers advanced topics in international economics with a special emphasis on quantitative techniques employed international trade. This course is divided into two main components: the first part introduces important concepts and provides the theoretical foundations of the structural gravity equation. The second part deals with partial and general equilibrium trade policy analysis using structural gravity.

Prerequisites

This lecture requires a solid background in microeconomics and advanced knowledge of quantitative techniques.

Course Objectives:

The lecture aims to offer a comprehensive approach to trade policy analysis with the structural gravity model to provide deep intuition and practical guidance in order to make partial and general equilibrium trade policy analysis.

Mode of Assessment

The final grade is based on a tutorial exam (100%).

Course Schedule

1	Trade theory and the Structural Gravity Equation (1/2)
2	Trade theory and the Structural Gravity Equation (2/2)
3	Estimating Structural Gravity: Challenges, Solutions, and Applications (1/2)
4	Estimating Structural Gravity: Challenges, Solutions, and Applications (2/2)
5	General Equilibrium Analysis with the Gravity Model. Theory and Applications (1/3)

6	General Equilibrium Analysis with the Gravity Model. Theory and Applications (2/3)
7	General Equilibrium Analysis with the Gravity Model. Theory and Applications (3/3)

Readings

Main textbook and additional readings (**Compulsory Reading)**

- Head K. and T. Mayer, 2014. "Gravity Equations: Workhorse, Toolkit, and Cookbook", Handbook of International Economics, 4th ed, 4:131-195.
- Gravity Cookbook website
- Costinot, A., and A. Rodríguez-Clare, 2014. "Trade Theory with Numbers: Quantifying the Consequences of Globalization", Handbook of International Economics, 4th ed, 4:131-195.
- ****Yotov, Y. V., Piermartini, R., Monteiro, J. A., & Larch, M. (2016). An advanced guide to trade policy analysis: The structural gravity model. Geneva: World Trade Organization.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

Tutorial exam (100%).

Asset pricing

Instructor : Jérôme DUGAST, Université Paris Dauphine-PSL, DRM-Finance

Contact information :

E-mail: jerome.dugast@dauphine.psl.eu

Web: <https://sites.google.com/view/jeromedugast/home>

Information on the course :

Master 2, Semester 1

Course load: 30h

ECTS : 3

Elective course for the fields MF & ET

Prerequisite

Overview

In this course, we will discuss a wide range of topics ranging from optimal portfolio, the CAPM, factor models, consumption-based asset pricing, and arbitrage pricing to more special ones including asymmetric information and limits to arbitrage.

Evaluation

Assignment & final exam.

Course Schedule

Traditional Asset Pricing Theory:

1. Optimal Portfolio Theory and the CAPM
2. Factor Models

Modern Asset Pricing Theory:

3. Decision Making under Uncertainty
4. Consumption-based Asset Pricing
5. Arbitrage Pricing
6. Dynamic Asset Pricing
7. Asymmetric Information and Asset Prices
8. Limits to Arbitrage

Readings

Fundamental textbooks

- Back, Kerry E., Asset Pricing and Portfolio Choice Theory, Oxford University Press, revised edition, 2017.
- Cochrane, John H., Asset Pricing, Princeton University Press, revised ed., 2005.

By chapter

1. Optimal Portfolio Theory and the CAPM:

- Cochrane, chapters 5 and 9. Back, chapters 5 and 6.
- Markowitz, Harry (1952), Portfolio Selection, Journal of Finance 7, 77-91.
- Lintner, John (1965), The Valuation of Risky Asset and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, Review of Economics and Statistics 47, 1337.
- Sharpe, William (1964), Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, Journal of Finance 19, 425-442.
- Black, Fisher (1972), Capital Market Equilibrium with Restricted Borrowing, Journal of Business 45, 444-454.

2. Factor Models:

- Cochrane, chapters 6, 9, and 12. Back, chapter 6.
- Ross, Stephen A. (1976), The Arbitrage Theory of Capital Asset Pricing, Journal of Economic Theory 13, 341-360.
- Fama, Eugene F. and Kenneth R. French (1993), Common Risk Factors in the Returns on Stocks and Bonds, Journal of Financial Economics 33, 3-56.
- Fama, Eugene F. and Kenneth R. French (1996), Multifactor Explanations of Asset Pricing Anomalies, Journal of Finance 51, 55-84.

3. Decision Making under Uncertainty:

- Back, chapter 1.
- Morgenstern, Oskar and John von Neumann (1944), Theory of Games and Economic Behavior, Princeton University Press.
- Pratt, John W. (1964), Risk Aversion in the Small and in the Large, Econometrica, 32, 122-136.
- Rothschild, Michael and Joseph E. Stiglitz (1970), Increasing Risk I: A Definition, Journal of Economic Theory, 2, 225-243.

4. Consumption-based Asset Pricing:

- Cochrane, chapter 3. Back, chapters 2 and 4.

- Arrow, Kenneth J. and Gerard Debreu (1954), Existence of an Equilibrium for a Competitive Economy, *Econometrica*, 22, 265-290.

5. Arbitrage Pricing:

- Back, chapters 3 and 8.

6. Dynamic Asset Pricing:

- Back, chapters 9–11.
- Merton, Robert (1973), An Intertemporal Capital Asset Pricing Model, *Econometrica* 41, 867-887.
- Lucas, Robert (1978), Asset Prices in an Exchange Economy, *Econometrica*, 46, 1429-1445.
- Breeden, Douglas T. (1979), An Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities, *Journal of Financial Economics*, 7, 265-296.
- Campbell, John Y. and Robert J. Shiller (1988), The Dividend-Price Ratio and Expectations of Future Dividends and Discount Rates, *Review of Financial Studies*, 1, 195-228.

7. Asymmetric Information and Asset Prices:

- Grossman, Sanford J. and Joseph E. Stiglitz (1980), On the Impossibility of Informationally Efficient Markets, *American Economic Review*, 70, 393-408.
- Hellwig, Martin F. (1980), On the Aggregation of Information in Competitive Markets, *Journal of Economic Theory*, 22, 477-498.

8. Limits to Arbitrage:

- De Long, J. Bradford, Andrei Shleifer, Lawrence H. Summers, and Robert J. Waldmann (1990), Noise Trader Risk in Financial Markets, *Journal of Political Economy*, 98, 703-738.
- Shleifer, Andrei and Robert Vishny (1997), The Limits of Arbitrage, *Journal of Finance*, 52, 35-55.
- Gromb, Denis and Dimitri Vayanos (2002), Equilibrium and welfare in markets with financially constrained arbitrageurs, *Journal of Financial Economics*, 66, 361-407.
- Kondor, Peter (2009), Risk in Dynamic Arbitrage: The Price Effects of Convergence Trading, *Journal of Finance*, 64, 631-655.
- Duffie, Darrell (2010), Presidential Address: Asset Price Dynamics with Slow-Moving Capital, *Journal of Finance*, 65, 1237-1267.

Behavioral economics and bounded rationality

Professor:

Bertrand Villeneuve (Université Paris-Dauphine, LEDa & PSL Research University)

Contact Information

bertrand.villeneuve@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 21h, 7 sessions of 3h each

ECTS : 3

Mandatory course for the ET field, elective course for the SPP and MF fields

Overview:

The topic has reached a certain degree of maturity and it is part of an aspiring economic culture. After attending the classes, the students will be able to read the cutting-edge research on the topic. Given the variety of ways by which standard (non-behavioral) models can be tweaked, the course is not intended to promote a particular view, but to help would-be modelers to better motivate their choices.

Prerequisites:

Expected utility, Game theory. Basic probability theory, particularly Bayesian calculus.

Course Objectives:

The objective of the course is to present the most important themes in behavioral economics. This dynamic research program is largely empirical (anecdotes, experiments, structural econometrics). Accordingly, authors point at behaviors that standard models relying on rationality assumption cannot explain. The course itself will focus on models and their empirical validity. By choice, the course will not be principally about experimental protocols - yet protocols are explained occasionally - but rather on main ideas, results, and debates. The diverse applications will be treated all along.

Course Schedule

1	Reference dependent preferences 1/2
2	References dependent preferences 2/2
3	Errors in probabilistic judgment and biases
4	Intertemporal choice and inconsistency 1/2
5	Intertemporal choice and inconsistency 2/2
6	Attention and inattention
7	Social preferences

Readings

Highly recommended for the fascinating and lively excursion across almost all topics: Daniel Kahneman's 2011 book, *Thinking Fast and Slow*.

The main reference is the *Handbook of Behavioral Economics*, Elsevier, 2018 and 2019. All chapters are dense. Some of them are heavily used for the lectures.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: Yes

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Mode of Assessment

(30%) 4 Multiple-Choice Questions in class + 70% (written exam).

Class participation: Encouraged.

Exam policy: MCQ to incite to regular work.

Time limited, on-table exam. Test for ability to solve exercises, to summarize one topic among those studied in class, to freely comment facts given in a short paper.

Advanced Game Theory

Professor: Sidartha Gordon, Université Paris Dauphine-PSL, LEDa

Contact Information

sidartha.gordon@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 18 h, 6 sessions of 3 hours per session

ECTS : 3

Mandatory for the ET field, elective for the SPP field

Overview:

The first part of the course is devoted to non-cooperative game theory models of strategic information transmission and communication.

In the second part, we will introduce a recent literature on the choice of an information structure by a designer (or principal) for an agent or a set of agents who interact strategically in an asymmetric information setting.

Prerequisites

Master 1 courses: Mathematics and optimization, game theory, asymmetric information.

Course Objectives:

The objective of the course is to give a deep background in interactive decision-making and its applications. We will notably present the recent models that address the issue of how information should be designed under informational asymmetries across agents.

After having attended the course, the students will be able to read recent academic papers applying game theory to various areas of economics and to make themselves use of game theory in their future research work.

Course Schedule

1	Multistage games with incomplete information played by Bayesian players. Equilibrium concepts capturing backward induction. Variants of sequential equilibrium.
2	Equilibrium concepts capturing forward induction.
3	Correlated equilibrium and communication equilibrium.
4	Strategic information transmission: the unidimensional model.
5	Information design: The case of one sender and one receiver
6	Information design: Extensions to multiple senders, receivers and dynamic settings Bayes Correlated Equilibrium

Readings

Basic readings

- J. Harrington, “Games, strategies and decision making”, 2d edition, Mc Millan, 2015: Chapters 8, 9, 10, 11, 12.
- Mas-Colell, A., M. Whinston, and J. Green (1995), *Microeconomic Theory*, New York, Oxford University Press: Chapter 9.
- Myerson, R. “Game Theory: analysis of conflict”, Harvard University Press, 1991.

Selected articles

- Crawford V. and J. Sobel (1982), “Strategic Information Transmission,” *Econometrica*. [Crawford and Sobel \(Ecta 1982\).pdf \(brown.edu\)](#)
- Sobel J. (2013), “Giving and Receiving Advice,” in *Advances in Economics and Econometrics*, D. Acemoglu, M. Arellano, and E. Dekel (eds.). [Advice.pdf \(ucsd.edu\)](#)
- Sobel J. (2013) “Ten Possible Experiments on Communication and Deception,” *Journal of Economic Behavior and Organization*. [20120703-ExperimentsRevision.pdf \(ucsd.edu\)](#)
- Gordon, S., Kartik N., Lo M., Olszewski W. and J. Sobel (2022), “Effective Communication in Cheap-Talk Games,” working paper.
- Forges F. (2020), “Games with Incomplete Information: From Repetition to Cheap Talk and Persuasion,” *Annals of Economics and Statistics*.
- Bergemann D. and Morris S. (2019), “Information Design: a Unified Perspective,” *Journal of Economic Literature*.
- Kamenica E. and Gentzkow M. (2011), “Bayesian Persuasion,” *American Economic Review*.
- Bergemann D. and Morris S. (2016), “Bayes Correlated Equilibrium and the Comparison of Information Structures in Games,” *Theoretical Economics*.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**.

Grading

The numerical grade distribution will dictate the final grade, according to the faculty’s recommended grade distribution.

Mode of Assessment

The final grade is made of a final written exam (80%) and oral participation (20%)

Class participation: Active class participation – this is what makes classes lively and instructive. Come on time and prepared (homework has to be done). Counts for 20% of the course grade.

Experimental Economics

Professor:

Claire Rimbaud (University Paris-Dauphine, LEDa & PSL)
Alessandro Ispano (University Paris-Dauphine, LEDa & PSL)

Contact Information :

claire.rimbaud@dauphine.psl.eu
alessandro.ispano@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 18h, 6 sessions; 3 hours per session

ECTS: 3

Mandatory course for the field ET, elective course for the field SPP

Overview:

The module will cover both methodology - why and how experiments in economics are conducted - and specific topics from the experimental literature via recent research articles.

Prerequisites

Bachelor-level microeconomics

Course Objectives:

The aim of the module is to introduce students to the use of experimental methods in economics

Mode of Assessment

There are 2 problem sets and 1 take homework assignments accounting for 70% of the mark. Presenting papers will account for the remaining 30%. At the end of each topic, students will be asked to read some of the remaining material (not covered in the course). Randomly selected students will make a 30mins presentation about the assigned paper. Also, during the course, 2 practical problem sets will be assigned. Randomly selected students will be asked to discuss their problem sets' solutions (codes and results).

There is no final exam.

Course Topics

1	How experiments can be useful to economists?
2	Experimental methods
3	Research papers: Psychological Game Theory
4	Research papers: Processing information in individual decisions
5	Research papers: Processing information in strategic settings
6	Students' presentation

Readings

Charness, G., & Pingle, M. (Eds.). (2021). *The art of experimental economics: twenty top papers reviewed*. Routledge.

Friedman, D., & Sunder, S. (1994). *Experimental methods: A primer for economists*. Cambridge university press.

Moffatt, P., Starmer, C., Sugden, R., Bardsley, N., Cubitt, R., & Loomes, G. (2009). *Experimental economics: Rethinking the rules*. Princeton University Press.

+ articles cited in class.

Moodle

This course is on Moodle : **Yes**

Grading

Class participation: Active class participation – this is what makes classes lively and instructive. Come on time and prepared.

Exam policy: In groups, students should prepare a mock pre-registration (for an experiment of their choice). The mock pre-registration and its oral presentation will constitute 50% of the final grade. A final written exam on the content of the class will constitute the other 50% of the final grade

Inequality and redistribution

Professor:

Laura Khoury (Université Paris Dauphine, LEDa & PSL Research University)

Contact Information

Laura Khoury laura.khoury@dauphine.psl.eu

Information on the course:

Master 2, Semester 1

Course load: 21 hours, i.e. 7 sessions of 3 hours each

ECTS: 3

Mandatory course for the SPP field, elective course for the ET field

Overview:

In most developed countries, inequality has been rising in recent decades, becoming a key political issue at the center of the public debate. This course aims at understanding the historical evolution of between- and within-country inequality from the late 19th century until today, and what are the key drivers explaining this evolution. How to adequately measure inequality? How does globalization impact global inequality? What is the effect of technological change on labor income inequality? What is the role of public policies in mitigating these effects? We will review economic theories and use up-to-date empirical techniques to address these questions. Through the presentations of recent research papers, students will also get acquainted with the multiple dimensions of inequality (e.g. gender inequality, racial inequality, inequality in education outcomes, etc.).

Prerequisites

Statistics (Basic level)

Microeconometrics (M1 mandatory course)

Course Objectives:

At the end of the course, students should be able to:

- Describe the evolution of income inequality in developed and developing countries since the 19th century
- Identify and describe the drivers of the change in labor and capital inequality
- Understand and use models to rationalize the change in labor and capital inequality
- Understand and design policy tools that can mitigate inequality through redistribution

Course Schedule

1	Introduction to the Economics of Inequality and Redistribution: definitions and stylized facts
2	Inequality between Labor and Capital and interpersonal income inequality
3	Within- and Between-country Inequality
4	Determinants of Labor Inequality + Determinants of Capital Inequality
5	Taxation and Labor Supply + Optimal transfer and labor income taxation policy
6	Optimal capital taxation
7	If time allows, introduction to inequality of race and gender

Readings

A specific reading list is provided at the start of each session

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: Yes

Assessment

Assessment will be based on a presentation (30%), a final written exam (65%) and participation in class (5%). The presentation will consist in presenting in class a research paper addressing the question of inequality. The final exam will be a mix of short questions about concepts seen in class and questions where the student will be asked to develop his own analysis using the concepts seen in class.

Environment and Sustainability

Professor: Anna Creti, Université Paris Dauphine - PSL Research University, LEDa

Contact Information

anna.creti@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 21 h, 7 sessions of 3 hours per session

ECTS : 3

Elective course for all fields

Overview:

Global warming and the related environmental and social issues raise serious concerns for the welfare of our current and future generations. Such changes require developing new approaches and solutions to address these key issues so that they can become and remain sustainable. The course Environment and Sustainability will introduce students to key theories and models related to the environment, sustainability, societal issues, and the United Nations' Sustainable Development Goals.

Prerequisites

Advanced Micro and Macro Economics

Course Objectives:

Students will be able to critically evaluate the complex drivers and consequences of global environmental problems for different societal groups, applying academic concepts and theories. They will develop in-depth knowledge in specialist areas of the environment and sustainability and gain critical thinking skills. Finally, attendees will be able to assess the effectiveness, equity and trade-offs of different sustainability goals and policies.

Course Schedule

1	Introduction: challenges for sustainability toward the net-zero economy
2	Sustainability: definition and examples
3	Sustainability: theoretical challenges
4	Climate Change: definition and examples
5	Climate Change: theoretical challenges
6	Climate Change policies
7	The energy transition

Readings

Dasgupta, Sir Partha. "The Economics of Biodiversity The Dasgupta Review Abridged Version." (2021).

Richard S. J. Tol, Climate Economics: Economic Analysis of Climate, Climate Change and Climate Policy Edward Elgar Publishing, 2019 - 234 pages

Selected Videos from <https://rtol.github.io/ClimateEconomics/video/>

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Mode of Assessment

Class participation: Explicitly considered in the grading: 20%.

Exam policy: written report: 80%

Health, welfare, and health behavior

Professor: Peter Eibich, Université Paris Dauphine - PSL Research University, LEDa

Contact Information : peter.eibich@dauphine.psl.eu

Information on the course :

Master 2, Semester 1

Course load: 21 h, 7 sessions of 3 hours per session

ECTS : 3

Mandatory course for the field SPP

Overview:

This course will provide an overview of economic approaches to health investment decision-making. At the societal level, policy makers have to decide which health interventions (incl. preventive measures, drugs and medical procedures) to fund to maximize population health outcomes with limited economic resources. In the first part of the course, we will examine health economic evaluation as one potential framework to make such decisions. The course will cover the principles of economic evaluation and discuss the advantages and downsides of this approach. We will work through an example of how a cost-effectiveness analysis is conducted in practice, and we will discuss how evidence from such analyses is used in healthcare systems around the world by looking at several countries as case studies.

In the second part of the course, we will consider individual decision-making for health and health behaviour. We will discuss economic models of the demand for health and their implications for individual health behaviour and the demand for healthcare. We will also consider behavioural economic models for risky health behaviour (e.g., smoking) and discuss empirical evidence for these models.

Prerequisites: None

Course Objectives: After participating in this course, students will:

- Understand how economic evaluation can be used to assess health interventions.
- Be able to critically discuss decision-analytic models for cost-effectiveness analyses.
- Have an overview of how evidence from economic evaluations is used in healthcare decision-making in different institutional contexts
- Understand how economic principles can be applied to model the demand for health and health behaviour.
- Have an overview of the empirical literature on risky health behaviour.
- Be able to critically assess empirical studies on health behaviour.

Course Schedule

1	Principles of health economic evaluation
2	Conducting cost-effectiveness analyses
3	Using economic evaluation to support decision-making in healthcare (case studies)
4	The demand for health: The health capital model and the health deficit model
5	Economics of risky health behavior: Theory
6	Economics of risky health behavior: Evidence
7	Economics of health prevention

Readings

Textbooks:

Some of the material we will cover is discussed in the two textbooks below. Zweifel et al. (2009) is available online through the library, and especially in the first part of the course we will follow the exposition there closely. There is no need to buy these books if you do not have access to them.

- Zweifel, P., Breyer, F., and Kifmann, M, 2009. Health Economics, 2nd Edition, Springer Berlin Heidelberg.
- Sloan, F. and Hsieh, C.-H., 2017. Health Economics, 2nd Edition, MIT Press Cambridge Massachusetts.
- *Papers:*
- The papers listed below provide some additional background to the material discussed in class.
- Cropper, M.L., 1977. Health, Investment in Health, and Occupational Choice. Journal of Political Economy 85, 1273–1294.
- Dalgaard, C.-J., Strulik, H., 2014. OPTIMAL AGING AND DEATH: UNDERSTANDING THE PRESTON CURVE. Journal of the European Economic Association 12, 672–701. <https://doi.org/10.1111/jeea.12071>
- Grossman, M., 2000. The Human Capital Model, in: Culyer, A.J., Newhouse, J.P. (Eds.), Handbook of Health Economics. Elsevier, pp. 347–408. [https://doi.org/10.1016/S1574-0064\(00\)80166-3](https://doi.org/10.1016/S1574-0064(00)80166-3)
- Grossman, M., 1972. On the Concept of Health Capital and the Demand for Health. Journal of Political Economy 80, 223–255.
- Walker, S., Sculpher, M., Drummond, M., 2011. 733 The Methods of Cost-Effectiveness Analysis to Inform Decisions about the Use of Health Care Interventions and Programs, in: Glied, S., Smith, P.C. (Eds.), The Oxford Handbook of Health Economics. Oxford University Press, p. 0. <https://doi.org/10.1093/oxfordhb/9780199238828.013.0031>

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Class participation: Encouraged

Exam policy:

- Presentation of an academic paper on risky health behaviour in session 6 of the course (30% of the final grade)
- Written final exam (70% of the final grade)

Labor, education, and public policies

Professors:

Gabrielle Fack (Université Paris Dauphine, LEDa & PSL Research University)

Lionel Wilner (CREST-ENSAE)

Contact Information

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Lionel Wilner lionel.wilner@ensae.fr

Information on the course:

Master 2, Semester 1

Course load: 24 hours, i.e. 8 sessions of 3 hours each

ECTS : 3

Mandatory course for the SPP field, elective for the field ET

Overview:

This course will present an overview of topics in Labor and Education. The first part of the course will cover various topics at the frontier of current research in Labor economics. More specifically, we will consider the fundamentals of wage determination, the forms and consequences of Labor market discrimination, the theory and empirics of job search, and the provision of unemployment insurance. The course will systematically discuss the relevant policy implications. The second part of the course will review the returns to education, the reasons for government intervention in Education, and will then cover three main types of interventions: demand side policies (financial and information interventions), supply side policies (school resources) and policies aimed at reducing inequalities (affirmative action).

Prerequisites

Microeconomics, microeconometrics at the Graduate 1 level

Course Objectives:

The first objective of the course is to equip the students with the tools that will allow them to understand the contemporary labor market and the relevant public policies. With this aim, it will first provide students with advanced knowledge of the determinants of wages, both from a theoretical and an empirical perspective. At the end of the course, the students will be able to identify the mechanisms underlying matching between employers and employees, wage setting within firms, and will have a good understanding of the main quantitative methods used by labor economists. They will also be able to contribute to the design of public policies related to labor market discrimination, unemployment insurance, etc.

The second objective of the course is provide students with a critical analysis of government intervention in education. It will present an overview of the main types of education policies, together with in-depth empirical analysis of the impact of specific policies. At the end of the course, the students will be able to identify the market failures and equity issues that concern education, and the type of policies that may be considered to solve them. They will also have a good understanding of the main quantitative methods used by economists to evaluate the impact of educational policies and contribute to the social debate on education.

This class will be useful to students who want to do a PhD dissertation in the field of applied labor economics and education economics as well as to students who plan to work in institutions that produce studies and policy recommendations regarding education and the labor market, such as the OECD, Ministries of Labor, the ILO, etc.

Course Schedule

1	Education I: Returns to education
2	Education II: demand side policies (financial and information interventions)
3	Education III: supply side policies (school resources)
4	Education IV: policies aimed at reducing inequalities (affirmative action)
5	Labor I: Wage determination

6	Labor II: Labor market discrimination
7	Labor III: Job search and matching models
8	Labor IV: Unemployment insurance

Readings

Tito Boeri and Jan Van Ours, *The Economics of Imperfect Labour Markets*, 2nd edition, Princeton University Press, 2013.

Pierre Cahuc, Stéphane Carcillo and André Zylberberg, 2014, *Labour Economics*, 2nd edition, MIT Press.

Hanushek, E., and Welch, D. (eds.), *Handbook of the Economics of Education*. Amsterdam: North Holland volumes 1 to 5

Articles listed on the reading list provided at the start of the course

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: Yes

Assessment

Written and oral assessment

During the course, students will be asked to present an article chosen in the reading list of the course. This presentation will be graded. A final exam will take place during the exam week. The final grade will be computed as a weighted average of the oral presentation (30%) and written exam (65%) grades, as well as a grade to account for participation (5%).

Exam policy: In the exam, students will not be allowed to bring any document (except if allowed by the lecturer). Unexcused absences from exams or failure to submit cases will result in zero grades in the calculation of numerical averages. Exams are collected at the end of examination periods.

Semester 2 courses

A. Data science & economics

Machine Learning for Applied Economic Analysis

Professor: Mathilde Godard, CNRS, University Dauphine-PSL, LEDa

Contact Information mathilde.godard@cnrs.fr

Information on the course :

Master 2, Semester 2

Course load: 24 h, 8 sessions of 3 hours per session

ECTS : 3

Elective course for all fields

Overview:

Economic science has evolved over several decades toward greater emphasis on empirical work. Ever increasing mass of available data ('big data') in the past decade is likely to have a further and profound effect on economic research (Einav and Levin, 2014). Beyond economic research, governments and the industry are also increasingly seeking to use 'big data' to solve a variety of problems, usually making use of the toolbox from machine learning (ML).

The question we ask in this course is the following: What do we (not) learn from big data and ML as economists? Is ML merely applying standard techniques to novel and large datasets? If ML is a fundamentally new empirical tool, how does it fit with what we know? How does it fit with our tools for causal inference problems? As empirical economists, how can we use big data and ML? We'll discuss in detail how ML is useful to collect new data, for prediction in policy, and to provide new tools for estimation and inference.

Prerequisites : Machine Learning (Semester 1)

Course Objectives:

1. Present a way of thinking about ML that gives it its own place in the econometric toolbox.
2. Develop an intuition of the problems to which it can be applied, and its limitations.
3. Think of unstructured data (text, image) as data we can use when economic outcomes are missing.
4. Specific focus on application of ML to social policies (health/labor/taxation/environment etc.).

Course Schedule

1	Intro ; How ML works: An applied econometric approach
2	Collect new data ; Application to webscrapping
3	Prediction for policy 1/2
4	Prediction for policy 2/3
5	Prediction for policy 3/3
6	Recap causal inference (Rubin framework) ; Prediction in the service of estimation 1/2
7	Prediction in the service of estimation 2/2
8	Recap

Readings

Mullainathan, Sendhil and Jann Spiess (2017). "Machine learning: An applied econometric approach". In: Journal of Economic Perspective 31.2, pp. 87-106.

Kleinberg, Jon et al. (2015). "Prediction policy problems". American Economic Review 105.5, pp. 491-495.

Athey, S. (2017): “Beyond prediction: Using big data for policy problems”, Science 355, 483–485.

Athey, Susan, and Stefan Wager. 2021. “Policy Learning with Observational Data”, Econometrica, 89(1): 133-161.

Kleinberg, J., Lakkaraju, H., Leskovec, J., Ludwig, J. and S. Mullainathan (2018): “Human Decisions and Machine Predictions”, The Quarterly Journal of Economics, Volume 133, Issue 1, Pages 237–293.

Susan Athey, Guido W. Imbens. 2019. Machine Learning Methods That Economists Should Know About. Annual Review of Economics 11:1, 685-725.

Athey, Susan, and Guido Imbens. 2016. “Recursive Partitioning for Heterogeneous Causal Effects”. PNAS 113(27): 7353–60.

Belloni, A., V. Chernozhukov, S. Mullainathan and J. Spiess and C. Hansen.(2014): “High-Dimensional Methods and Inference on Structural and Treatment Effects” Journal of Economic Perspectives, Volume 28, Number 2 – Spring 2014, Pages 29–50

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty’s recommended grade distribution.

Mode of Assessment

Class participation: Explicitly taken into account in the grading (+0,5 points max on average grade).

Exam policy:

- In-class : pairwise presentation of an academic paper (30% of overall grade).
- Final exam (in-class written text): 70% of overall grade.

NLP for economic decisions

Instructor: Yannick Le Pen (Université Paris Dauphine, PSL, LEDa)

Contact information: Yannick.le_pen@dauphine.psl.eu

Information on the course

Course load : 24 hours, 8 sessions, 3 hours each

ECTS : 3

Status : **Elective course for all fields**

Overview

The purpose of this course is to present the fundamentals methods of Natural Language Processing (NLP) and their applications through practical exercises and cases. NLP is the field of Artificial Intelligence which uses statistical methods to analyze texts in a systematic way.

Prerequisites

Intermediate level in Python or R

Intermediate level in statistics and econometrics

Machine Learning Course (Master 2, semester 1)

Course Objectives

In this course, we will cover the NLP process from preprocessing and representation to supervised and unsupervised task-specific learning.

After attending the course, the students should

- Have a good understanding of the principles and main methods of NLP
- Be able to run a project of NLP

Course Schedule

1. Introduction
2. Text Classification
3. Text Summarization
4. Topic Modeling
5. Word Embedding
6. Sentiment Analysis
7. Large Language Models

Assessment :

100%: NLP project by groups of two or three students

Readings

Delip Rao and Brian McMahan (2019) Natural Language Processing with Pytorch, Cambridge: O'Reilly

Vajjaka, Sowmya et al. (2020) Practical Natural Language Processing: A Comprehensive Guide to Building Real-World NLP Systems, Cambridge: O'Reilly.

Internet Ressources

Jurafsky, Daniel and James H. Martin (2023) Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition

https://web.stanford.edu/~jurafsky/slp3/ed3book_jan72023.pdf

<https://www.kaggle.com/>

Sentometrics:

<https://sentometrics-research.com/>

B. Specialization courses

Advanced Health Economics

Professor: Elsa Perdrix, Université Paris- Dauphine- PSL, LEDa, LEGOS

Contact Information : elsa.perdrix@dauphine.psl.eu

Information on the course :

Master 2, Semester 2

Course load: 18h, 7 sessions of 3 hours per session

ECTS : 3

Mandatory course for the SPP field

Overview:

The course addresses important issues in Health Economics at an advanced level: design and regulation of health insurance (efficiency and coverage), managed competition systems; the impact of health insurance on medical prices (coverage of demand, medical networks), physician agency, hospital competition under fixed prices and quality of care, health investment.

These subjects are all linked to current policy questions in most countries: is it important for efficiency to put copayments in place, i.e. to limit coverage for an efficient use of healthcare? Are managed competition systems effective in promoting price competition between insurers, or do they encourage patient selection? Does supplementary health insurance encourage balance billing in France? Do medical networks implemented by some insurers contribute to limit prices? Is there a risk that hospital payment systems that are based on lump-sum payments per stay encourage a decrease in the quality of hospital care?

Lastly, this course covers new issues in Health Economics, and recent developments of research in this fields: the role of technology in health (does it improve the efficiency of the system, the healthcare access and quality?); the relationship between health and climate changes (how climate changes affect healthcare demand and supply); and the challenges associated with an ageing population (How to face the needs for medical care and long-term care of the generation of the baby-boom, how the changes in family composition affect the provision of informal long-term care).

Prerequisites

At the M2 level: Semester 1: “Health, welfare and health behavior”

At the Master 1 level : Microeconomics 1 & 2

Course Objectives:

The objective of the course is to present the state of the art as concerns the treatment of the main current issues in health economics.

After having attended the classes, the students should be able to take up the reading of most research papers in health economics. They will be able to know how to gather sensible literature to write a comprehensive international survey on any policy question in health economics.

Course Schedule

1	General Introduction – Presentation of the Healthcare System
2	Health Insurance
3	Physician agency and induced demand
4	Hospital care regulation
5	Health Investment
6	The next challenge in health research: Technology, climate change ageing population and health

Readings

To be specified soon

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Mode of Assessment

2 pages literature review (60%) + Presentation of a scientific paper (40%).

Class participation: Active class participation – this is what makes classes lively and instructive. Come on time and prepared.

Exam policy Unexcused absences from courses, exams or failure to submit cases will result in zero grades in the calculation of numerical averages. Exams are collected at the end of examination periods.

Financial frictions in macroeconomics

Professor: Fabien Tripier, Université Paris- Dauphine- PSL, LEDa

Contact Information fabien.tripier@dauphine.psl.eu

Information on the course

Master 2, Semester 2

Course load: 18 hours (6 sessions of 3 hours)

ECTS : 3

Mandatory course for the MF field, elective for the ET field

Overview:

The course focuses on the macroeconomic implications of financial frictions in macroeconomics. Understanding the origins and consequences of these imperfections is essential to address key challenges of financial crisis for macroeconomists. The course shows how to integrate these financial frictions (in the financing of firms and financial institutions) into business cycle models, assess their ability to explain the stylized facts of cycles and inequalities, and develop economic policy recommendations.

Prerequisites:

- Macroeconometrics 1 (M1 – Semester 1 ; M2 QEA Semester 1)
- Business cycles analysis (M1 – Semester 2)

Course Objectives:

The objective of the course is to provide theoretical foundations of financial frictions in up-to-date business cycle models and to assess the ability of these models in explaining the key stylized facts related to business cycles. The implications of economic stabilization and macroprudential policies will also be discussed.

Course Schedule:

1	Why didn't macroeconomic models predict the Great Financial Crisis?
2	Uncertainty in crisis times: a challenge for policy makers
3	New macroeconomic models to assess unconventional monetary policies
4	The European System of Financial Supervision in the Aftermath of the Great Recession

Readings

Uncertainty fluctuations

Basu, Susanto, and Brent Bundick. "Uncertainty shocks in a model of effective demand." *Econometrica* 85.3 (2017): 937-958.

Bloom, N. (2009). The impact of uncertainty shocks. *econometrica* 77(3), 623–685.

Bloom, N. (2014, Spring). Fluctuations in Uncertainty. *Journal of Economic Perspectives* 28(2), 153–76.

Financial frictions for firms

Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. *Handbook of macroeconomics*, 1, 1341-1393.

Christiano, L. J., Motto, R., & Rostagno, M. (2014). Risk shocks. *American Economic Review*, 104(1), 27-65.

Kiyotaki, Nobuhiro, and John Moore. "Credit cycles." *Journal of political economy* 105, no. 2 (1997): 211-248.

Financial frictions for banks

De Fiore, Fiorella, and Harald Uhlig. "Bank finance versus bond finance." *Journal of Money, Credit and Banking* 43.7 (2011): 1399-1421.

Gertler, M. and P. Karadi (2011). A model of unconventional monetary policy. *Journal of Monetary Economics* 58(1), 17–34.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

Assignment preparation: Each lecture, an assignment must be prepared and students are randomly picked up to correct the assignment in front of the class.

Final grade: Final written exam

Policies in developing countries

Professor:

Olivia Bertelli, University Paris Dauphine – PSl, LEDa, DIAL

Contact Information

Olivia.bertelli@dauphine.psl.eu

Information on the course :

Master 2, Semester 2

Course load: 18 h, 6 sessions of 3 hours per session

ECTS : 3

Mandatory course for the SPP field

Overview:

The very large efforts carried out by countries and international organizations to increase income and fight poverty have been unequally successful. While some countries have seen impressive growth in the last 30 years, 736 million people still live in extreme poverty, one child out of three is undernourished and lacks access to drinking water. Famines and conflicts keep rising around the globe, undermining human and economic development.

How to fight poverty and inequality? How to improve the life conditions of millions of people? This course looks at major public policies and interventions that tackled poverty in developing countries in the past twenty years. After discussing the main concepts and tools to measure poverty, inequality and human development, we will go deep in analysing actions taken around the world to improve people's lives. The course focuses on impact evaluations of public policies tackling the constraints to human and economic development tied to education, health, gender and agriculture in developing countries. It provides insights into social policies in developing countries, with a focus on the instruments and the political economy of the implementation of policies

Prerequisites

The class will sometimes get technical regarding the econometric methods adopted in the papers. We will discuss key methods along with the papers applying them. We expect the students to be familiar with panel estimation methods and IV methods, which can be read up in the following references:

- Wooldridge, J. M. (2009). Introductory Econometrics. Mason (Cengage Learning Services).
- Kennedy, P. (2003): A Guide to Econometrics, 5th edition, Malden (Blackwell). [less math]

Course Objectives:

The overall objectives of this course are to provide students with an overview of policies in developing countries, with a focus on the different types of instruments and the political economy of policy implementation. It will also discuss the impacts of education, health, gender and agricultural policies

in developing countries.

The course is based on selected contemporary applied research in development economics, to be read by the students and to be discussed in class. By the end of the course, the students are expected to master the main challenges related to policies in developing countries and know the most recent evolutions in this literature. They will also be able to critically assess research work.

Course Schedule

1	Poverty, inequality, human development. Main concepts and measures
2	Poverty, inequality, human development. Main concepts and measures
3	Education economics in developing countries
4	Health economics in developing countries
5	Gender inequalities
6	Agriculture development

Readings

- Acemoglu, Daron, and Simon Johnson. "Disease and development: the effect of life expectancy on economic growth." *Journal of political Economy* 115.6 (2007): 925-985.
- Baird, Sarah, Craig McIntosh, and Berk Özler. "Cash or condition? Evidence from a cash transfer experiment." *The Quarterly journal of economics* 126.4 (2011): 1709-1753.
- Behrman, Jere R., Susan W. Parker, and Petra E. Todd. "Do conditional cash transfers for schooling generate lasting benefits? A five-year follow-up of PROGRESA/Oportunidades." *Journal of Human Resources* 46, no. 1 (2011): 93-122. ^[11] _{SEP}
- BenYishay, Ariel, and A. Mushfiq Mobarak (2019) "Social learning and incentives for experimentation and communication." *The Review of Economic Studies* 86.3: 976-1009.
- Chattopadhyay, R., & Duflo, E., 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica*, 72(5), 1409-1443.
- Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers (2006) "Missing in action: teacher and health worker absence in developing countries." *The Journal of Economic Perspectives* 20, no. 1: 91-116.
- Cohen, Jessica, and Pascaline Dupas (2010) "Free distribution or cost-sharing? Evidence from a randomized malaria prevention experiment." *Quarterly journal of Economics* 125.1: 1.
- Duflo, Esther (2001) "Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment." *American economic review* 91.4: 795-813.
- Duflo, Esther (2012) "Women empowerment and economic development", *Journal of Economic Literature*, vol.50 n.4: 1051-1079
- Duflo, Esther, Pascaline Dupas, and Michael Kremer (2015), "School governance, teacher incentives, and pupil-teacher ratios: Experimental evidence from Kenyan primary schools", *Journal of Public Economics*, 123 : 92–110
- Dupas, Pascaline. "What matters (and what does not) in households' decision to invest in malaria prevention?" *The American Economic Review* (2009): 224-230. ^[11] _{SEP}
- Miguel, Edward, and Michael Kremer. "Worms: identifying impacts on education and health in the presence of treatment externalities." *Econometrica* 72.1 (2004): 159-217.
- Mammen, K. and Paxson, C. (2000) "Women's work and economic development", *Journal of Economic Perspectives*, vol.14 n.4: 141-164

- Qian, Nancy (2008) "Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance." *The Quarterly Journal of Economics* 123.3: 1251-1285.
- Timmer, C. Peter (2002) "Agriculture and economic development." *Handbook of agricultural economics* 2: 1487-1546.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **Yes**

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Mode of Assessment

- Students' presentation 20%
- Final written or oral exam 70%
- Class participation 10%

Empirical Industrial Organization

Instructor: Daniel Herrera, PSL Mines Paris tech

Contact information :

Daniel.herrera@minesparis.psl.eu

Information on the course

Master 2, Semester 2

Course load: 21 hours

ECTS : 3

Mandatory course for the ET field, elective for the SPP and MF fields

Overview:

To be completed soon

Readings

To be completed soon

Natural gas economics

Instructors: Anna Creti, Université Paris Dauphine - PSL

Contact

Anna.creti@dauphine.psl.eu

Information on the course

Master 2, Semester 2

Course load: 18 hours

ECTS : 3

Elective course for the ET field

Overview

This course explores the theoretical and empirical perspectives developed to gain insights into the economic, regulatory and policy issues pertaining to the natural gas sector. It discusses aspects of the demand, supply, logistic, industrial organization, regulatory and public policy issues that affect the economics of natural gas markets. The course will develop some of the issues discussed in the course "Electricity and Gas Market Empirical Modelling" (delivered during the first semester in the Master Energy, Carbon, Finance. If necessary, materials related to this first-semester course can be delivered upon demand to Pr Creti).

Course Schedule

1	Introduction: Gas fundamentals I - Natural gas demand models
2	II – Upstream issues - Gas resource extraction problems - Resource monetization issues III – Supply chain issues and problems - The economics of natural gas pipelines
3	III – Supply chain issues and problems (cont.) - LNG economics - The economics of natural gas storage
4	IV – Industrial organization - Long-term contracts - The traditional I.O., its shortcomings and the restructuring reforms - The actual organizations of natural gas markets. - Contemporary market design issues and lessons learned from the restructuring process
5	V – The economics of natural gas trade - Perfect and imperfect competition models - Cooperation models.
6	VI – The role of natural gas in the energy transition. - Is natural gas a bridge fuel? - Biogas - Insights for pipeline-based decarbonizing technologies (hydrogen, CCS).

Pre-requisite

Microeconomics, Industrial Organization, Energy Economics

Exam policy

Short dissertation (15 pages) written by groups of 2 students, with oral presentation

Readings

The course will have quite a bit of background reading. The professors have developed a reading list that will be distributed during each lecture.

Computational social choice

Professors:

Jérôme Lang (Université Paris Dauphine-PSL, LAMSADE)

Dominik Peters (Université Paris Dauphine-PSL, LAMSADE)

Contact Information

Jérôme Lang : jerome.lang@lamsade.dauphine.fr

Dominik Peters: dominik.peters@lamsade.dauphine.fr

Information on the course :

Master 2, Semester 2

Course load: 24 h, 8 sessions of 3 hours per session

ECTS : 3

Elective course for the ET field

Beware that this course is common with the Master IASD (Artificial Intelligence and Data Science) and will take place rue de l'Estrapade, 75005 Paris

Overview

The course consists of the analysis of problems arising from the aggregation of preferences of a group of agents from a computational perspective. On the one hand, it is concerned with the application of techniques developed in computer science, such as complexity analysis or algorithm design, to the study of social choice mechanisms, such as voting procedures or fair division algorithms. On the other hand, computational social choice is concerned with importing concepts from social choice theory into computing.

The course will focus on normative aspects, computational aspects, and real-world applications (including some case studies).

Prerequisites

Prerequisite-free. Basics of discrete mathematics (especially graph theory) and algorithmics is a plus.

Course Objectives

The aim of this course is to give an overview of the problems, techniques and applications of computational social choice, a multidisciplinary topic at the crossing point of computer science (especially artificial intelligence, operations research, theoretical computer science, multi-agent systems, computational logic, web science) and economics.

Course Schedule

1. Introduction to social choice and computational social choice.
2. Preference aggregation, Arrow's theorem and how to escape it.
3. Voting rules: informational basis and normative aspects.
4. Voting rules: computation.
5. Strategic issues: strategyproofness, Gibbard and Satterthwaite's theorem, computational resistance to manipulation, other forms of strategic behaviour.
6. Voting on combinatorial domains.
7. Communication issues in voting: voting with incomplete preferences, elicitation protocols, communication complexity, low-communication social choice.
8. Fair division of indivisible goods.
9. Matching under preferences.
10. Specific applications and case studies (varying every year): rent division, kidney exchange, school assignment, group recommendation systems...

Readings

Handbook of Computational Social Choice (F. Brandt, V. Conitzer, U. Endriss, J. Lang, A. Procaccia, eds.), Cambridge University Press, 2016. Available for free online.

Trends in Computational Social Choice (U. Endriss, ed), 2017. Available for free online.

Grading

Written exam by default. Possibility to replace the exam by a project.

Advanced Environmental Macroeconomics

Professors:

Garth Heutel (Georgia State University)
Lise Patureau (Université Paris Dauphine-PSL)

Contact Information

Garth Heutel : gheutel@gsu.edu
Lise Patureau: lise.patureau@dauphine.psl.eu

Information on the course :

Master 2, Semester 2
Course load: 15 h, 5 sessions of 3 hours per session
ECTS : 3
Mandatory course for the MF field

Overview:

The course focuses on market failures in environmental economics and the appropriate macroeconomic policies to correct them, with a particular focus on carbon taxing in an intertemporal perspective. The course is gradual and starts with a presentation of Integrated Assessment models (IAM) that analyze climate policy in a long perspective. Next, the course introduces the notion of carbon taxing at the business cycle frequency in Dynamic Stochastic General Equilibrium (DSGE) models. Environmental policy in the short term may interfere with the economic cycle, inflation dynamics as well as credit cycles.

Prerequisites

A solid background in both micro and macro is a prerequisite. The course in Business Cycles Stabilization and Policies (Master 2, Semester 1) is a prerequisite, as this lecture is a direct extension to macroeconomic stabilization.

Course Objectives:

The objective of the course is to provide students with an overview of recent developments in environmental macroeconomics dealing with carbon tax policies interacting with financial, nominal and economics components of the economy.

Students should be able to solve the theoretical models presented and to interpret their normative predictions. From a practical perspective, students are also expected to learn the relevant institutional framework for implementing these policies.

Course Schedule

1	A presentation of Integrated Assessment models
2	The intertemporal implementation of optimal carbon tax
3	Environmental economics and real business cycles
4	Environmental economics and nominal rigidities
5	Environmental economics and financial frictions

Readings

Papers studied in class, list provided in the slides

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **No**.

Grading

The numerical grade distribution will dictate the final grade, according to the faculty's recommended grade distribution.

Class participation: Encouraged, this is what makes the lectures lively

Exam policy: Final written exam of 2 hours, 100% of the final grade.

C. Prepare your job market insertion

Internship / PhD project

Professor: Lise Patureau

Contact Information : lise.patureau@dauphine.psl.eu

Information on the course :

Master 2, Semester 2

ECTS : 6

Mandatory for all fields

Overview:

This internship/PhD project is intended to prepare the job market insertion of the students after graduation. If choosing the PhD project option, the student prepares a PhD project to submit to the SDOSE doctoral school primarily, but also to other PhD programs in other universities, in France and/or abroad. Doing so, the student paves the way to his future PhD in economics. If choosing the internship option, the student will benefit from a long-lasting experience (Internship of 4-month minimum) in a private company, international institution or research center to improve his competencies in view of his future career.

Course Objectives:

At the start of Semester 2, the student is asked to choose between two options: PhD project or internship. There is no hours in class dedicated to this course.

- If the PhD project option is chosen, the student must write a well-structured PhD proposal that fulfills with the requirement of the SDOSE Doctoral school at Dauphine and/or the requirements of other PhD programs in France or abroad. This should be done in close link with the Master thesis supervisor.
- If the internship option is chosen, the student must find an internship of a minimum of 4 months, to be finished before graduation in early December of the next academic year.

Moodle

Pedagogical supports (slides and other materials) will be available through Moodle: **No teaching material is required**

Grading

Whatever the choice between PhD project and internship, the validation is subject to oral defense based on a written report. The oral defense takes place in front of a senior faculty from the LEDa specialist of the field of specialization of the student, either before the application deadline to PhD grant of the PSL doctoral program in economics (mid-June at the latest) or at the end of the internship. The oral defense lasts around 40 minutes (20 minutes of presentation and 20 minutes of Q&A). Ahead of the defense, the student shall send her internship report / PhD project to the senior faculty and the person responsible of the Master. A final grade (100%) is attributed based on both the written document and the oral defense.

Exchange opportunity with UAM, Spain

Summary of the exchange program

The Master 2 QEA track has just set in place an international agreement with the Master in Quantitative Economic Analysis (MQuEA) at the Universidad de Autónoma de Madrid (UAM), Spain. The MQuEA is a recent Master degree which shares many similarities with the M2 QEA track – i.e, research-oriented profile, fully in English, and with a strong quantitative content.

The curriculum of the MQuEA is more restricted scope than QEA; in particular, it does not include SPP-related courses in the training. Accordingly, **exchange possibilities for QEA students are restricted to students in the MF or ET fields only.**

The international agreement stands for **up to 3 students from each Master**. The selection procedure is made by the head of the Master of origin.

Selected MQuEA students will come to Paris during the first semester; **selected QEA students will go to Madrid during the second semester**. All semester 2 courses will be followed at UAM, except for the Master thesis support seminar which will be followed online for QEA students in exchange.

QEA students in exchange should validate the equivalent of 9 ECTS in the QEA track (equivalent to 3 courses) – See the details of the curriculum below.

Deadline for application to the exchange program is : July 17, 2025. Application should internally be made through the requested Forms. Selected QEA students are expected to fulfill the administrative registration process before September 2024 to ease the administrative steps of the IA procedure that will follow.

Semester 2 curriculum for M2 QEA students at UAM

Up to three students of the Master Quantitative Economic analysis have to opportunity to follow second semester's courses in Madrid, following courses delivered by the Master in Quantitative Economic Analysis of the University Autonoma de Madrid (UAM).

All courses of Parts (A) and (B) are delivered in Madrid. The official language of UAM Master is English, so speaking Spanish is not a pre-requisite to participate to the exchange program.

Course	Hours in class	Nb of ECTS
<u>(A) Data science & economics, one to choose (3 ECTS)</u>		
Introduction to Big Data	30	3
<u>(B) Specialization course, 2 to choose within the chosen field (6 ECTS)</u>		
Social and Economic Networks	30	3
Competition Economics	30	3
Quantitative Methods in macroeconomic analysis & forecasting Business Cycles	30	3
International Economics and Finance	30	3
<u>(C) Prepare your job market insertion (21 ECTS)</u>		
(a) Master thesis		15
(b) PhD proposal / Internship		6