PANTHÉON-ASSAS UNIVERSITÉ PARIS

Syllabus : Classes in English

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PARIS

Further topics in Statistics – Prof. Christina Pawlowitsch

1st semester - L2 – 30hrs

Program: Collège d'économie

Description:

In this class, we are going to review the fundamental concepts of probability theory and apply them to problems in mathematical economics. We are going to discuss in particular models of interactive knowledge and belief revision as they have been introduced in economics by Robert Aumann's 1976 article\Agreeing to disagree."

Evaluation for this class is based on your preparation of reading assignments and exercises, your participation during the sessions, and your term paper.

Program
Session 1: A review of the fundamental concepts: basics of set theory, _-algebra
Session 2: The review continued: probability spaces, random variable
Session 3: The review continued: Bayes' Law
Session 4: Modeling information and beliefs about events (Aumann's 1976 model)
Session 5: continued
Session 6: Dynamic processes of belief revision (Geanakoplos and Polemarchakis's 1982 model)
Session 7: continued
Session 8: No-bet theorems (Sebenius and Geanakoplos's 1983 model)
Session 9: continued
Session 10: Discussion

Economic Analysis of the Law – Prof. Marie Obidzinski

1st semester - L3 – 30hrs

Program: Collège d'économie

Description:

This course is an introduction to the economic analysis of law. The course will cover several main topics in the economic analysis of law through a general presentation and exercises

Chapter 1: The Economics of Civil Liability
I. The basic model: one-sided accident and given level of activity
II. Extensions of the basic model
Exercises

Chapter 2. Applications in liability law
I. Product liability.
II. Environmental damage.

Chapter 3. Economic analysis of dispute resolution
I. Optimistic models
II. Strategic models
III. Social and private incentives to fill a suit
IV. Cost-sharing rules and recourse to justice

Chapter 4. Deterrence and public enforcement of the law
I. Theoretical predictions of the deterrence model
II. Non-monetary sanctions
III. Justifications for moderate monetary sanctions

Chapter 5. Applications of the offence deterrence model.
I. The fight against money laundering.
II. Deterring insider trading.

Chapter 6. Law and finance
I. Governance of widely held companies.
II. Legal framework and economic performance.

References

• Chappe N. (2005), Économie et Résolution des Litiges, Economica
• Cooter, R. et T. Ulen (2016), Law and Economics, 6ième éd., Addison Wesley Longman, disponible en ligne.
• Deffains, B. et E. Langlais (dir., 2009), Analyse économique du droit, De Boeck.
• Miceli, T. J. (2004), The Economic Approach to Law, Stanford University Press.
• Polinsky, A. M. et S. Shavell (dir., 2007), Handbook of Law and Economics, Vol. 1 et 2, North-Holland.
• Shavell, S. (2004), Foundations of Economic Analysis of Law, Harvard University Press

Optimization and linear programming – Prof. Naila Hayek & Bertrand Crettez

1st semester – L3 – 30 hrs

Program: Collège d'économie

Description:

This an advanced undergraduate course in static optimization. It is useful for students who want to develop analytical skills in order to better understand advanced economic subjects taught at the master level such as Game Theory, Decision Theory, General Equilibrium Theory etc.

The course begins with some useful reminder of topology in an n-dimensional space, such as the space of commodities in microeconomics. The notions of norms, open/closed sets, continuity, differentiability and convexity are treated. The second part focuses on the proof of two important separation-hyperplane theorems. The third part uses these theorems to prove the Karush-Khun-Tucker Theorem, a central tool in non-linear constrained optimization. The fourth and last part is about linear programming and duality.

References:

B. Crettez "Lecture Notes" (they will be sent by email)

N. Hayek and JP. Leca "Mathématiques pour l'économie – Analyse Algèbre"

Grading: Mid-term and final written exams.

PANTHÉON-ASSAS
UNIVERSITÉ
PARIS

Intermediate Microeconomics - Prof. Naila Hayek & Lucie Ménager

1st semester – L3 – 30 hrs

Program: Collège d'économie

Description:

The first part of the course "Advanced Microeconomics" presents in a rigorous way several results that are at the heart of microeconomics. The main objective of the course is to learn how individual decision-making is modelled in economics. There are several types of decisions that must be taken in everyday life: how to allocate my budget to be as happy as possible? Should I subscribe an insurance? How much should I save for my retirement?

The first half (of the first part) of the course is about how to model decision under certainty. The central issue will be about how to define "rational" preferences, and why this definition may be considered controversial. The second half will be dedicated to the study of preferences under uncertainty. The axiomatic treatment of expected utility of von Neumann and Morgenstern will be presented. This part will be concluded with an analysis of human behavior in face of risk.

In the second part of this lecture, we will introduce a general field that we could describe as a normative analysis of politics. It will be based on social choice and game theory and will use theoretical as well experimental approach.

Required knowledge: Advanced Microeconomics (L2) — Elements of game theory — Probability

Lecture 1: Game theory (reminder to start well)
Lecture 2: Condorcet jury: theory and paradox
Lecture 3: Electoral competition
Lecture 4: Single-dimension models

Competition law and economic analysis - Prof. Chloé Le Coq

1st semester – L3 – 20 hrs

Program: Certificat d'analyse économique du droit

Description :

Competition law aims to guarantee respect for the principle of free competition. It therefore prohibits anti-competitive practices, including illegal cartels and abuse of a dominant position. This course is an introduction to the economic analysis of competition law.

It will propose different tools to assess how legal rules and regulations, defined by competition law, impact competition between firms. We will focus on the three pillars of competition policy, cartels, abuse of dominance and concentrations of companies. It will also discuss decisions made by courts or competition authorities in Europe and the United States.

Outline

1. Consumers, Producers, and Market efficiency

2. Acting in different competitive environment

3. Prohibited agreements

4. Abuse of dominant position

5. Mergers and Acquisitions

6. Analysis of specific decisions by courts or competition authorities in EU or USA

Monetary Macroeconomics – Prof. Xiangyu Qu

1st semester – L3 – 24hrs

Program: Magistère Banque-Finance

Description:

Class 1 Introduction to Macroeconomics
Class 2 The Measurement and Structure of the National Economy
Class 3 The Asset Market, Money, and Prices
Class 4 The IS–LM/AD–AS Model: A General Framework for Macroeconomic Analysis
Class 5 Classical Business Cycle Analysis: Market-Clearing Macroeconomics
Class 6 Keynesianism: The Macroeconomics of Wage and Price Rigidity
Class 7 Monetary Policy and the Federal Reserve System
Class 8 Review

Required Textbook:
Macroeconomics, Andrew Abel and Ben Bernanke, 10th Edition.

Recommended Textbooks:
1. *Macroeconomics*, Paul Kurgman and Robin Wells, 6th Edition.
2. *Macroeconomics*, Olivier Blanchard, 8th Edition.

Introduction to capital markets – Prof. Roland Prévot

1st semester – L3 – 24hrs

Program: Magistère Banque Finance

Description:

Capital markets are becoming more complex than even thanks to the incredible innovations (computers, trading algorithms, data centers, etc.) the world experienced over the past 20 years.

This course will therefore cover a wide range of topics from primary to secondary markets, arbitrage, liquidity, equity trading, market micro and macro structure as well as a key introduction into the hidden world of High Frequency Trading firms and Dark Pools.

Key concepts:

This course will help students in improving their knowledge on Capital Markets (Buy Side vs Sell Side), Financial analysis departments, and Asset management equity, fixed income, commodities and forex.

Key concepts are: Market organization and structure, Trading, algorithms, equities and arbitrage

Corporate investment strategy – Prof. Damien Gaumont

1st semester – M1 – 36hrs

Program: Master Stratégies de l'entreprise et des marchés

Description:

The course on corporate investment strategies is divided into two parts. The first part presents the methods and models of corporate investment in a certain universe and the second in an uncertain universe. The course is based on a pedagogy that starts from concrete life and ends with modeling. This pedagogy allows to fix in mind the sometimes-complex mechanisms with which companies decide their investments. The models in certain universes are based above all on the concept of the schedule and the investment problems encountered by companies are presented. The concept of cash flow and its consequences are widely discussed. Investments being by nature inter-temporal, the notion of discounting and capitalization allow us to understand what are the criteria for making or refusing to make one or several investments. The analysis of physical investments is based on the concepts of actuarial rate and internal rate of return of projects. The second part of the course is devoted to models in an uncertain universe. It is necessary to define the axioms that allow the decision-maker to make rational reasoning in uncertainties. From these axioms, the portfolio theory and the models associated with it are presented. The concept of real option is finally introduced at the end of the course.

Mathematics and statistics for economists – Prof. Lisa Morhaim

1st semester – M1 – 36hrs

Program: Master Analyse et Politique Economique

Description:

The Mathematics and Statistics course is conceived to acquire skills both from a methodological viewpoint and tools. The following subjects will be developed.

- Methodology, how to modelize a problem, proofs, mathematics and statistics revised learning material
- Linear and nonlinear programming, static optimization, dynamic optimization, algorithms
- Probability, Statistics
- Numerical analysis and interpolations

Numerous examples, exercises and problems are discussed.

Macroeconomics and Economic Policy – Prof. Etienne Lehmann

1st semester – M1 – 36hrs

Program: Master Analyse et Politique Economique

Description:

Chapter 1 : Optimal income taxation

Chapter 2 : Optimal income and commodity taxation

Chapter 3: DSGE models

Chapter 4: Capital taxation: Why? How?

Advanced Microeconomics – Prof. Vassili Vergopoulos

1st semester – M1 – 36hrs

Program: Master Analyse et Politique Economique

Description:

Advanced Microeconomics teaches the fundamentals of microeconomics. The course covers selectively the first six chapters of the textbook of Mas-Colell et al. The program is as follows:

1. Preference and choice
2. Consumer choice
3. Classical demand theory
4. Production theory
5. Aggregate demand and production
6. Expected utility under risk

The course serves different purposes: First, it reviews and further refines the basic tools and results that students have learnt in their previous studies. It also seeks to provide students with a common language and background. Finally, it puts emphasis on formal and quantitative aspects of microeconomic theory and thus contributes to the development of the students' analytical skills. Students are evaluated on the basis of a written exam.

References

Microeconomic Theory. Andreu Mas-Colell, Michael D. Whinston and Jerry R. Green. 1995. Oxford University Press.

Introduction to Sustainable Finance – Prof. Chloé Le Coq

1st semester – M1 – 12 hrs

Program: Magistère Banque Finance

Description:

From social preferences to sustainable enterprise (Session 1, 3 hours)
Individual decisions in a social context
The responsibility of a business

The "social" investors (Session 2, 3 hours)
The social discounting rate
Modelling the social investor's utility function
Sustainable investing strategies

Sustainable finance Instruments (Session 3, 3 hours)
Traditional sustainable financial instruments
Financial innovations
Sustainable financial instruments on firms' performance

PANTHÉON-ASSAS
UNIVERSITÉ
PARIS

Contract Theory – Prof. Damien Gaumont

1st semester – M2 – 20 hrs

Program: Master Stratégies de l'entreprise et des marchés

Description:

This 20-hour course is offered at the Master 2 level (5th year of Economics) in the Master Corporate Strategy and Industrial Organization at university Paris Pantheon Assas. It is based on the book by Jean-Jacques Laffont and David Mortimort "THE THEORY OF INCENTIVES I : THE PRINCIPAL-AGENT MODEL »

The objective of the course is to provide a high level of comprehension of the role of contract theory in the true life. It is applied to the working relation inside the firm since every single student will somedays work in an organization either as an Agent (who produces) or as a Principal (who delegates the production).

Under perfect information a labor market equilibrium is defined as a wage such that the demand for labor equals the supply of labor at that particular wage. At the optimum the wage positively depends on the marginal productivity of workers. This is the first best equilibrium.

Under asymmetric information, such a concept of equilibrium is no longer relevant. It is necessary to replace the vector wage by a labor contract that encompasses both a quantity of good to be produced and a transfer (the wage) from the Principal who delegates the production to the Agent. We study the second best optimum. Under asymmetric information, there are two main situations: adverse selection and moral hazard.

Chapter 1 deals with Adverse selection: some individual's characteristics, which are relevant for production, are unobservable to the Principal. The optimal labor contract is computed. Some extension to bunching (different workers receive the same wage) and shut-down of the low type individual or pooling equilibria are presented. The Myerson's Principle of revelation is developed.

Chapter 2 is devoted to moral hazard: some individual's action, which are relevant for production, are unobservable to the Principal. The optimal labor contract is computed for a risk neutral agent as well as for a risk adverse agent. General utilities are considered and the information rent extraction is studied at the second best optimum.

Corporate Governance – Prof. Damien Gaumont

1st semester – M2 – 20 hrs

Program: Master Stratégies de l'entreprise et des marchés

Description:

The purpose of this course is to present the decision-making structure of companies, more commonly known as "corporate governance". The choice of an optimal decision-making structure is an important issue because of the worldwide wave of privatizations, an increasing number of mergers, acquisitions, takeover bids, market deregulation, capital market integration (especially in Europe), and the increased presence of pension funds, mutual funds, insurance companies, and banks in the boards of directors or management of firms. This course studies, from the point of view of the theory of agency in asymmetric information, the conflicts of interest existing between the executive and the shareholders (whether they are dispersed or not), but also the conflicts of interest existing between the firm and its creditors (banks, insurance companies), between the firm and its employees (represented by the unions), between the firm and its suppliers. Models of takeover bids, shareholder groups, boards of directors, management boards, managerial compensation and multi-voter models are presented. Finally, capital transaction techniques and company valuation methods are detailed.

Ethics – Prof. Nathalie Columelli

1st semester – M2 – 10 hrs

Program: Magistère Banque Finance

Description:

The first decade of the 21st century has experienced many crises for the investment industry. This period has encompassed many instances of unethical behavior by business executives and investment professionals, through Ponzi schemes, insider trading, weak governance, diligence and fraud. Unethical behavior has been highlighted in fields such as investment ratings, financial product packaging and distribution and investment management firms. As markets function to an important extent on trust, each case has resulted in heavy financial losses and stained reputations and lost investors trust. The CFA Institute Code of Ethics and Standards of Professional Conduct's goal is to set the highest standards for education, integrity, and professional excellence for the ultimate benefit of society. Such standards are critical to maintaining and recovering public's trust in financial markets and in the investment profession.

Key concepts:

Reference frame and scope: Capital Markets, Financial analysis departments, and Asset management.

Key concepts: law, codes and regulation, professionalism, diligence, fiduciary duties, respect, suitability, fair representation, transparency, conflicts of interest, disclosures, transparency.

Learnings objectives:

This course objective is to increase the students' awareness of the importance of ethics.
They will learn, from their own experience, the recent scandals and their short and long term impacts:
– Why it matters to act ethically
– How and why both the very nature of finance added to common irrational human biases may impair
one's capacity to act ethically.
– The major rules and laws that have been enacted to protect consumers and shareholders
– How to increase the odds for sound ethical decision making

Through the analysis of the CFA Institute code of ethics and Standards of Practice Handbook as well as movies and short case studies, the students will:
– Have an overall knowledge of the CFA Institute code of ethics
– Identify the best standards of professionalism and integrity
– Identify unethical behaviors and take appropriate corrective actions
– Adopt and Use a framework for ethical decision-making
– Know approaches to embed ethics in corporate governance organization and strategic decisions

Competition Policy – Prof. Chloé Le Coq

1st semester – M2 – 20 hrs

Program: Master Analyse et Politique Economique

Description:

Competition law aims to guarantee respect for the principle of free competition. It, therefore, prohibits anti-competitive practices, including illegal cartels and abuse of a dominant position. The course studies the strategic interaction among firms in imperfectly competitive markets, the sources of market power, and the rationale and impact of competition policy.

Aims:
This course aims at providing a theoretical and practical understanding of the main issues in competition policy. It offers students a first understanding of competition policy, particularly the firms' strategic interaction within markets. Lectures will use analytical tools, basic concepts in game theory, and empirical tools. Practical examples will be provided, and a few case studies will be discussed throughout the course.

Learning Outcomes
At the end of the module, students should be able to:
1. Learn about the major concepts of competition policy
2. Examine drivers and challenges of competition policy based on the analysis of firms' strategic interaction
3. Practice synthesizing articles on specific cases of competition policy systematically
4. Become familiar with existing empirical tools and practice applying them to concrete cases.

Course outline
1. Competition (Policy) in Economics
2. Market Definition and Market Power
3. Horizontal or Vertical agreements and Enforcement Laws
4. Mergers and Acquisitions
5. Behavioral Anti-trust

Monetary Policy Implementation – Prof. Mariana Rojas-Breu

1st semester – M2 – 24 hrs

Program: MBFA parcours Economie Monétaire et Bancaire

Description:

- Introduction. Basic concepts in monetary economics.
- Objectives of monetary policy.
- The practice of monetary policy (historical evolution). The debate on the operational target of monetary policy: monetary aggregates vs. interest rates.
- The interbank market and the implementation of monetary policy in normal times. Main instruments of monetary policy. Monetary policy systems run by modern central banks (channel system, floor system).
- The Poole model of the interbank market.
- Anomalies in the interbank market.
- The conduct of unconventional monetary policy.
- The implementation of monetary policy with central-bank digital currencies.

Banking and Financial Stability – Prof. Mariana Rojas-Breu

1st semester – M2 – 24 hrs

Program: MBFA parcours Economie Monétaire et Bancaire

Description:

- Introduction. Basic concepts in banking and finance. Direct finance vs indirect finance. Specificity of banking and financial regulation.
- Fractional Reserve Banking System. Bank runs and bank panics. Fundamental vs. beliefs-based bank runs. Regulatory and institutional responses to financial instability.
- Narrow banking.
- Liquidity provision and the lender-of-last-resort function of the central bank.
- Financial crises. Business-cycle view of bank runs. Efficient bank runs.
- Bail-outs vs. bail-ins and financial fragility.
- Aggregate uncertainty and assets' _resales.
- Optimal capital and liquidity regulation.
- The Diamond-Dyvbig model. Extensions with capital requirements, deposit insurance, bail-outs.
- Central-bank digital currencies. Impact on banking and financial stability.

Financial decision theory – Prof. Vassili Vergopoulos

1st semester – M2 – 15 hrs

Program: Master Ingénierie Statistique et Financière

Description:

Financial Decision Theory teaches classical economic and financial applications of decision theory under risk and uncertainty. The first part of the course reviews the basic tools from expected utility under risk and uncertainty. The second part introduces students to theories of ambiguity (Knightian uncertainty). The third part is really the core of the course and focuses on applications to portfolio choice, demand for insurance, savings behavior, optimal risk sharing in financial markets. The program is as follows:

1. Expected utility under risk and uncertainty: (comparative) risk aversion, risk premium, coefficients of risk aversion, prudence, stochastic dominance, etc.
2. Ambiguity theory: Ellsberg paradox. Introduction to Choquet Expected Utility and Maxmin Expected Utility.
3. Financial applications: (a) the role of risk aversion in portfolio choice/demand for insurance, (b) the role of prudence in the formation of precautionary savings, (c) the role of heterogeneity in belief in the emergence of speculative trade among risk averse investors, (d) ambiguity as an explanation for several empirical "anomalies" (equity premium puzzle, portfolio inertia, absence of trade, etc.)

Students are evaluated on the basis of a written exam and a group project that allows them to either deepen the notions discussed in class or learn new economic and financial applications of decision theory.

References :

Economics of Risk and Time. Christian Gollier. 2004. MIT Press.

Behavioral Industrial Organization – Prof. Xiangyu Qu

1st semester – M2 – 15 hrs

Program: Master Ingénierie Statistique et Financière

Description:

Recommended Textbook: Bounded Rationality and Industrial Organization, Ran Spiegler, Oxford University Press.

Suggested Survey Readings:
1. Chapter 6 - Behavioral Industrial Organization, Paul Heidhues and Botond Koszegi, in: Handbook of Behavioral Economics: Applications and Foundations 1.
2. Bounded Rationality in Industrial Organization, Glenn Ellison, in: Advances in economics and econometrics: theory and applications, ninth World Congress (2).

Course Outline:
Class 1 Loss Aversion and Reference-Point Dependent Preferences
Class 2 Time-inconsistent consumers
Class 3 Markets with boundedly rational or differentially informed consumers
Class 4 Overconfidence
Class 5 Attention

Course Objectives: Behavioral economics has introduced psychological complexity into the standard economic framework of individual decision making, with the goal of understanding observed puzzles in market as well as improving the predictive power of models.

Big Data and Open Data – Prof. Patrick Bury

1st semester – M2 – 15 hrs

Program: Master Ingénierie Statistique et Financière

Description:

We want to provide here a global overview of the main tools used in the Big Data world. Lectures are spread over two main parts for each lecture, one theoretical and one very practical, hands on data. We will introduce providers (Microsoft, Google, Amazon), main devops tools (Docker, gitlab,…) , workflow (mar-reduce), databases (graph DB, document oriented, …) and tools (tensorflow). We also give a short introduction to Dataviz and statistical interpretation.

Map :

1. Introduction to Big Data
2. Open Data, definition, sources, Licences
3. Big Data definition and anti-definition
4. Usual scales in Big Data
5. Solutions provider overview
6. Big Data Databases
7. Introduction, shortcuts and pitfalls in dataviz
8. Introduction to Hadoop
9. Map-Reduce principles and usage
10. AWS offers
11. Azure offers
12. Google offers
13. Sovereign cloud (new for 2020-2021)
14. Docker principle and application
15. Gitlab Howto
16. Map reduce with Azure (can be changed)
17. Graph databases
18. Tensorflow

PANTHÉON-ASSAS
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Introduction to MatLab – Prof. Lionel Perret

1st semester – M2 – 15 hrs

Program: Master Ingénierie Statistique et Financière

Description:

The objective of this class is to learn the basics of MATLAB programming in order to be able to manipulate matrices, resolve equations and problems, import databases from excel, draw elaborate custom graphs and create an interactive form.

Map :

- Working with the Command Window
- Variables, matrices, equations
- Scripts : functions and programs
- Programming with conditions and loops
- Graphs
- Animations
- Livescript
- Creating Apps
- Debugging
- Excel importation

Law and Economics of the Firm – Prof. Chloé Le Coq

1st semester – M2 – 25 hrs

Program: Master Economie du Droit

Description:

This course examines whether businesses can credibly contribute to the shift towards a more sustainable future. In particular, we analyze the economic and legal challenges that arise when firms invest more/only resources in sustainable and socially responsible endeavors. Here is a sampling of the questions we address:
-What are the drivers and legal challenges of adopting sustainability strategies for traditional/commercial enterprises?
-Are social enterprises better at delivering inclusion and social innovation? Which legal obligations are associated with a firm's social mission?
-What are the existing economic and legal toolkits to evaluate the firm's social impact and map out stakeholders' diverse interests?

Outline

PART I INTRODUCTION
What is socially responsible behavior?
Sustainable goals and firm's activity
PART II CORPORATE SOCIAL RESPONSIBILITY AND FIRM'S GOVERNANCE
The responsibility of the firm
The stakeholder theory and corporate governance
PART III KEY DRIVERS OF CSR AND LEGAL FRAMEWORK
Legal regimes and CSR
Firm's market value and CSR
The criticism of CSR
PART IV SOCIAL ENTERPRISE (SE): DEFINITION AND MOTIVATION
Multiple definitions of social enterprise
Who are the social entrepreneurs?
What makes a social enterprise?
PART V SOCIAL ENTERPRISE: LEGAL FRAMEWORK AND METRICS
Do we need a legal framework for hybrid organization?
Legal form and mission drift
Social metrics
PART VI DEMAND FOR SUSTAINABILITY AND LEGAL CHALLENGES

The social trust deficit
Legal structures to aggregate impact capital

Microeconomics: Introduction to cooperative games – Prof. Alberto Grillo & Christina Pawlowitsch

2nd semester - L2 – 40hrs

Program: Collège d'économie & CMI EfiQuas

Description:

Game theory provides mathematical tools for analyzing situations in which players (individuals, firms, countries...) can interact; that is their choice influence the welfare of the others.
Non-cooperative game theory model situations where players cannot commit on agreements. The premises of non-cooperative game theory models are: a set of players, a set of actions for each player, a utility for each player (a function that goes from the set of action profiles to R) and an information structure.
Cooperative game theory models situations, where agents can benefit by cooperating, and commitment is possible. The premises of cooperative game theory models are a set of players and payoffs. But now, payoffs are functions that associate a group of players (a coalition) to a real number. If this payoff can be shared among players without any constraint, then we say that it is a game with Transferable Utility. If there are constraints, then the game is called a game without transferable utility. The main issue in cooperative games is to find "good allocation rules". For instance, think of a situation in which a set of players (entrepreneurs) form a coalition (a start-up). Then they work together and create a surplus (profit). How should they share this profit? What sharing rule should they use?

Chapter 1 Bargaining
Chapter 2 Games with transferable utility
Chapter 3 Core
Chapter 4 Shapley value
Chapter 5 Social Choice and Matching

Textbooks

Dequiedt, V., Durieu, J., Solal, P. (2011). Théorie des jeux et applications. Economica.
Maschler, M., Solan, E. S. Zamir (2013). Game theory.
Osborne, M. J., Rubinstein, A. (1994). A course in game theory. MIT press.

Macroeconomics: Monetary Economics – Prof. Sébastien Lotz

2nd semester - L2 – 20hrs

Program: Collège d'économie & CMI EfiQuas

Description:

This course first revisits in details the classical, IS/LM, and AD/AS models (hypotheses, equations, resolution, multipliers, policy effects, graphical effects, economic explanations). Second, the micro foundations of money demand are studied in order to introduce portfolio selection (Baumol, and Tobin model). Finally, the OLG model is presented in order to study the role of money in such an environment.

Economic Methodology – Prof. Chloé Le Coq

2nd semester – L3 – 18hrs

Program: Collège d'Economie

Description:

The aim of this course is to provide students with methodological knowledge which is sometimes insufficiently developed in the other courses of the undergraduate course. We will also insist on the requirements of the oral presentation, which are requested during the thesis or research thesis defense.

To do this, the course will be based on the study of simple research articles, which will be presented orally. Students must present two research articles of their choice and answer the questions associated with these articles. Students must also read and prepare the articles presented in class.

Introduction to financial modelling – Prof. Claude Cohen

2nd semester – L3 – 30hrs

Program: Magistère Banque Finance

Description:

"Introduction to Financial Modeling" is designed for MBF students who will pursue internships in financial service organizations including advisory and transaction service firms, investment banks, private equity and venture capital funds, asset management funds and leverage finance or private debt firms. Interns will be assisting senior teams in creating and maintaining complex financial models as per client needs. This course will attempt to harness Excel skills and what constitutes good modeling practice. In-person modeling sessions will cover business planning such financial statement analysis, business plans for start-ups and established business, capital budgeting, cost of capital, and corporate valuation methods.

Course content:

Excel main functions

- Financial functions.
- Logical functions.
- Lookup & Reference functions.
- Date & Time functions

Introduction to spreadsheets & financial models

- Model design and architecture
- Modeling best practices.
- On-line exercise

In-person exercises :

- Financial Planning & Forecasting.
- Capital Budgeting.
- Corporate Valuation

Introduction to derivatives (finance) – Prof. Nathalie Columelli

2nd semester - L2 – 21hrs

Program: Magistère Banque-Finance

Description:

A derivative is any financial instrument, whose payoffs depend in a direct way on the value of an underlying asset at a time in the future. Derivatives are contracts

- to buy or sell the underlying asset at a future time, with the price, quantity and other specifications defined today
- that give the right to buy or sell the underlying asset at a future time, with the price, quantity and other specifications defined today

This course places emphasis on market operations and the valuations of forward, futures, swaps, and options contracts and their interrelations. Major topics of trading strategies include hedging, arbitrage and speculation, on stock index, interest rate instruments, commodities and foreign currencies.

Key concepts:

Reference frame and scope: Capital Markets, Financial analysis departments, and Asset management equity, fixed income, commodities and forex.

Key concepts: Market organization, forwards, futures, options, margins, execution, delivery, pricing, valuation, hedging, arbitrage, speculation & strategy

Learning objectives

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

Knowledge: Students will have an understanding of
- The organization of derivative markets
- The uses and market functions of financial derivatives
- Basic theories on valuations of financial derivatives
- The relationships of financial derivatives with other financial instruments
- The concepts of hedging, arbitrage, and management of financial risks

Skills: Students will learn to
- Use various basic financial functions and models in financial calculations
- Use basic statistical and mathematical concepts in developing derivative strategies

Application abilities: Students will be able to
- Formulate hedging, arbitrage, and speculative strategies with derivatives
- Apply derivative pricing models to evaluate performances of financial assets and positions
- Compare relative performances of various financial instruments and investment strategies
- Evaluate the major effects of market (in)efficiencies

Values and Attitudes: Students will be able to
- Understand the risk of the misuse and/or abuse of financial derivatives
- Understand market failures caused by excessive risk-taking with financial derivatives

Method and course material:

Slides are sent to students before the course.
Class preparation is critical to success in this course. As intermediate quizzes are organized, mastering the slides up to latest covered session is critical.
All mentioned Hull chapters (§) in the "course structure" section (below) are not always fully covered for this introductive course.

Course structure

This 21-hour seminar is split in seven 3-hour classes.

FIRST AND SECOND CLASS

1) **Session 1 Introduction (Hull, §1 §2)**
   a) *Introduction*
      i) What is a derivative instrument?
      ii) Market participants
      iii) OTC and exchange traded derivatives => Post 2008 regulation
   b) *Main derivative products*
      i) Definitions and terminology
      ii) Forwards commitments
         (1) Forwards and Futures
         (2) Interest rate swaps IRS and Currency IRS
      iii) Contingent claims
         (1) Calls & Puts
         (2) European/American exercise

(3) Credit default Swaps (CDS)

c) *Uses of derivatives*
   i) Hedging, Arguments against hedging and Liquidity issues
   ii) Speculation
   iii) Arbitrage and Dangers

2) Session 2 Market & Organization (Hull, §2)

a) *Margins*
b) *Execution: defining best execution*, *Benchmarks for execution* and *Types of orders*
c) *Delivery*

THIRD AND FOURTH CLASS

QUIZZ 1 (30 minutes)

3) Session 3 Future & Forwards pricing and P&L (Hull §3 §4 §5 §6)

a) *Basis and choice of contract*
b) *Yield conventions*
c) Fundamentals of Futures and Forwards pricing and P&L
   i) Equity Future index
   ii) Bond Future Index
   iii) FRA and Eurodollar/Euribor contracts
   iv) Commodity Futures
   v) Forex

4) Session 4 introduction to Swaps an Options pricing and P&L (Hull §7 §10 §11 §25 §29 §33)

a) *Swaps overview*
   i) Pricing principles
   ii) First settlement

FIFTH AND SIXTH CLASS

QUIZZ 2 (30 minutes)

b) *Option fundamentals*
   i) Put/call parity
   ii) Factors influencing option prices
   iii) Boundaries for option premiums
   iv) Payoffs
c) *Other option-based derivatives*
   i) CDS fundamentals
   ii) Caps and floors fundamentals
   iii) Swaptions fundamentals

5) *Session 5 derivative strategies (Hull §12 §19)*

a) *Hedge with Equity Futures*
   i) Optimal hedge ratio using β

b) *Hedge with commodity Futures*
c) *Hedge with Bond Futures*
   i) Duration matching and duration-based hedge ratio
   ii) Limitation of duration-based hedging
d) *Option strategies: hedging and speculation*
   i) The Greeks
      (1) Delta Hedging
      (2) Gamma
      (3) Thêta and Rhô
      (4) Vega
      (5) Graphical representation of option portfolio payoffs and of P&L on maturity
   ii) Long synthetic asset
   iii) Covered call
   iv) Protective put
   v) Other classical option strategies

SEVENTH CLASS
LAST SLIDES, Q&A AND FINAL EXAM (1.5hours)

Grading:

A minimum mark of 10/20 on this seminar is required to validate the course.

Final score: 2 intermediate quizzes (weight = 2x20%) and a final exam (weight = 60%)

Exam material: Financial calculator (TIBA2+ preferred). Computers turned off. Printed material allowed (slides and Hull).

If a student misses one or two of the intermediate quizzes, his grade will be calculated as the sum of his other marks.

Please note that it is not possible to get a "make-up" for the final exam, without a very serious reason.

Bibliography :

Reference material

- Core reference material
  - Hull, Options, Futures, and Derivative Securities, 10th ed. Pearson
  - French version: Hull Options, Futures et autres actifs dérivés, 9ème édition, Pearson

- This course also maps most of the CFA level 1 “Derivatives” body of knowledge as well as some learning objectives of the CFA level 2 and Level 3 “Derivatives” body of knowledge. The reference book is:
    - Don M. Chance and Roberts Brooks, Introduction to derivatives and risk management, 9th ed. South-Western

International Investment Law – Prof. Catharine Titi

2nd semester – M1 – 36hrs

Program: Master Stratégies de l'Entreprise et des Marchés

Description:

This course will offer an introduction to the fundamental themes and issues of international investment law. International investment is one of the key drivers of economic development. It provides access to capital and facilitates technology and know-how transfers, it creates jobs, and it contributes to the development of infrastructure and to poverty reduction. Once established abroad international investment can face enormous risks. *International investment law studies the legal framework that addresses these risks.*

The course will cover both substantive and procedural investment standards. It will first examine the sources of international investment law, and especially international investment agreements, including megaregionals such as CETA and TPP. It will explore the types of international investment, with a focus on foreign direct investment (FDI). It will analyse the notions of 'investment' and 'investor' protected under international investment agreements and the ICSID Convention. It will address investment promotion mechanisms, and the admission and establishment of foreign investments.

It will then consider substantive investment protections, including provisions on expropriation, fair and equitable treatment, full protection and security, national and most-favoured-nation treatment, and free capital transfers, as well as exceptions and limitations to these standards. It will analyse international investment law's dispute settlement methods, and notably investor-state arbitration. It will explore the arbitration process, including jurisdiction and admissibility, the selection of arbitrators, their role, powers and ethical requirements.

The course will further examine the EU's ongoing endeavours to reform investor-state dispute settlement by creating an international investment court. The course will also cover the economic theories and the literature on FDI, and the political economy of investment protectionism and liberalisation (market access under the World Trade Organization and regional trade agreements), thus offering complementary legal and economic perspectives.

Applied Game Theory – Prof. Christina Pawlowitsch

2nd semester – M1 – 18hrs

Program: Master Ingénierie Statistique et Financière

Description:

Session 1 :

Introduction into the theory of costly signaling: history of the idea; the debate in economics, sociology, and biology. What are the problems to which it gives answers? Its applications?
The basic model: a costly-signaling game with 2 states of nature, 2 signals, and 2 actions in response to the signal.

Session 2, 3 and 4: *Equilibrium analysis of the game*

Session 5: Addressing the problem of multiple equilibria in signaling games: equilibrium refinement and selection

Session 6: Writing a research paper

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Optimisation: Theory and Algorithms – Prof. Nikos Pnevmatikos

2nd semester – M1 – 18hrs

Program: Master Ingénierie Statistique et Financière & Analyse et Politique Economique

Description:

The aim of this course is to introduce to graduate students the theory of optimization and its resolution through numerical algorithms.

The content of the course is the following :

- Reminders of multivariable calculus and fundamentals of optimization.
- Description of algorithms.
- Order and rate of convergence.
- Gradient descent and line search methods.
- Conjugate gradient methods.
- Newton method.
- Quasi-Newton methods.
- Linear Programming and the simplex method.

References : Nocedal and Wright “Numerical Optimization"

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Topics in Money, Banking and Finance – Prof. Sébastien Lotz

2nd semester – M1 – 18hrs

Program: MBFA parcours Economie Monétaire et Bancaire

Description:

The objective of this course is to read short articles (from economic newspapers, journals, institutions…) about money issues, monetary policy, banking, or finance, discuss them and explain the theoretic/economic analysis of these various topics.

Law and Economics – Prof. Chloé Le Coq

2nd semester – M1 – 24hrs

Program: Master Economie du Droit

Description:

In this course, we will apply the concepts and techniques of microeconomics to discuss the consequences of the law. We will analyze how legal rules affect individuals and groups' behavior (incentives). We will use welfare economics to evaluate legal rules, especially efficiency effects. We will also discuss the behavioural law and economics. We will go through an overview of the irrationality in economic behaviour to introduce its application and consequences to legal issues.

Outline

PART I INTRODUCTION
What is law?
How economists think?

PART II ECONOMIC ANALYSIS AND TOOLS
Assumptions to understanding behavior
Price theory
Efficiency. Impediments to economic efficiency. Externalities
The Coase theorem
PART III CRIME AND PUNISHMENT
The economic approach to crime
Law enforcement and optimal punishment
Comparative law enforcement
The economics of antitrust law

PART IV IMPACT OF THE LAW ON ECONOMICS (few examples)
Law and Finance
Legal tech
Climate change laws

PART V FOUNDATIONS of BEHAVIORAL LAW AND ECONOMICS (BLE)
The notion of bounded rationality
Social preference theory
Implications for Law and Economics

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PART VI ILLUSTRATIVE APPLICATIONS OF BLE

Pre-trial settlement and the litigation process

Behavioral Antitrust

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Econometrics of Insurance – Prof. Joseph Lanfranchi

2nd semester – M2 – 15hrs

Program: Master Ingénierie Statistique et Financière

Description:

In this lecture, we want to deal with two issues:

<u>How to deal with qualitative variables modelling in the SAS System</u>

First, we will focus on applications of your previous lecture about qualitative variables econometrics.

These applications will cover various forms of choice: binary, categorical and non categorical, ordered evaluation of choices, countable events. Also, the Sas software will be used as an econometric tool for modelling these choices.

<u>Highlight these methods in the field of insurance economics</u>

Also, these applications will be chosen from the field of insurance economics at large. The scope of study will cover the factors explaining the decisions between various forms of insurance, of complementary insurance and the effect of social insurance on individual's health behaviour.

Outline of the lectures:

- Discrete choice modelling:
  - Logit (or probit) modelling of choice of life insurance
  - Multinomial logit modelling of long-term care insurance
  - Ordered Logit or Probit modelling of choice of the extent of insurance cover

- Count data
  - Poisson and negative binomial modelling of the number of doctor visits in relation with the access to Medicaid or Medicare Insurance systems

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Advanced Quantitative Methods (Python) – Prof. Xiangyu Qu

2nd semester – M2 – 15hrs

Program: Master Analyse et Politique Economique

Description:

Class 1 Introduction and Types of Data
Class 2 Structure and Operators
Class 3 Conditions and Loops
Class 4 Functions and Visualization
Class 5 Introduction to Numpy

Course Objectives: The purpose of this course is to introduce the Python programming language and make you be able to use it efficiently and independently. You are strongly encouraged to execute all the examples I give in the classes. Some exercises are required to better assimilate the concepts covered in the classes.

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Financial decision theory – Prof. Vassili Vergopoulos

1st semester – M2 – 15 hrs

Program: Master Ingénierie Statistique et Financière

Description:

Financial Decision Theory teaches classical economic and financial applications of decision theory under risk and uncertainty. The first part of the course reviews the basic tools from expected utility under risk and uncertainty. The second part introduces students to theories of ambiguity (Knightian uncertainty). The third part is really the core of the course and focuses on applications to portfolio choice, demand for insurance, savings behavior, optimal risk sharing in financial markets. The program is as follows:

1. Expected utility under risk and uncertainty: (comparative) risk aversion, risk premium, coefficients of risk aversion, prudence, stochastic dominance, etc.
2. Ambiguity theory: Ellsberg paradox. Introduction to Choquet Expected Utility and Maxmin Expected Utility.
3. Financial applications: (a) the role of risk aversion in portfolio choice/demand for insurance, (b) the role of prudence in the formation of precautionary savings, (c) the role of heterogeneity in belief in the emergence of speculative trade among risk averse investors, (d) ambiguity as an explanation for several empirical "anomalies" (equity premium puzzle, portfolio inertia, absence of trade, etc.)

Students are evaluated on the basis of a written exam and a group project that allows them to either deepen the notions discussed in class or learn new economic and financial applications of decision theory.

References :

Economics of Risk and Time. Christian Gollier. 2004. MIT Press.