EDCBA

Economic **D**ecision and
Cost **B**enefit **A**nalysis

COURSE

BOOKLET

2018-2019

École des Ponts
ParisTech

PARIS SCHOOL OF ECONOMICS
ÉCOLE D'ÉCONOMIE DE PARIS

TABLE OF CONTENT

CORE COURSES

Cost Benefit Analysis – 3 credits, 18 hours lectures, 18 hours Tutorials

F. Henriet & Hélène Ollivier,
Semester: 1
Location: PSE – Campus Jourdan

The aim of this course is to provide students with the fundamental concepts and methods of cost-benefit analysis. The first part of the course focus on the economic foundations of CBA (social welfare function, externality and market failures) and the issue of the social discount rate. It then presents the methods for the valuation of non-market goods and quantitative methods for ex post evaluation (randomization, propensity score matching, double difference, IV estimation, regression discontinuity, distributional effects).

Econometrics and Data Analysis - 3 credits, 24 hours
A. Secchi
Semester: 1
Location: PSE – Campus Jourdan

This course is an introduction to master level Econometrics. It covers linear regression with single and multiple regressors, models for panel data structure and the Rubin causal mode but also covers the main microeconometric techniques that are used in policy evaluation: random experiments, matching, difference-in-difference, regression discontinuity and instrumental variables, with particular emphasis on local average treatment effect. It also introduces non-parametric techniques applied to density estimation and regression.

Applications and examples are developed using R, a language for statistical computing and graphics released under the terms of the GNU General Public License developed by the Free Software Foundation.

Reading to do before the start of the course: Stock, J. & Watson M., Introduction to Econometrics, first 3 chapters

Industrial Organization & Regulation - 3 credits, 24 hours
Francis Bloch
Semester: 2
Location: PSE – Campus Jourdan

The objective of the course is to provide an introduction to tools and methods to analyse the behaviour of firms on a market and the regulatory environment faced by firms. In addition, the student should be able to understand how these tools can prove useful to solve real world situations. The course covers Industrial organization, competition policy and regulation subjects, illustrated with concrete applications and case studies. In addition, exercises and problems will be given to help students understand the models analysed in the course.

Pre-requisites:

Students attending the course should have a good knowledge of microeconomics at the intermediate level, including the use of calculus to derive demand and production functions. We expect students to be proficient in the theory of the consumer and the theory of production. They do not need to know game theory or the theory of market equilibrium, as these will be covered during the courses.

References:

A useful reference in English is "Intermediate Microeconomics" by Hal Varian 9th Edition
- chapters 1-14 and 19-23
A useful reference in French is "Introduction à la Microéconomie" by Murat Yildizoglu
- chapters 1-13
Both books can be downloaded as pdf files.

Risk and uncertainty – 2 credits, 16 hours
Catherine Bobtcheff
Semester: 1
Location: PSE – Campus Jourdan

The main objective of this class is to review the different tools allowing to deal with economic decisions in an uncertain environment. The theory will be presented and several applications will be given (insurance, finance, investment decisions, role of asymmetric information…)

Pre-requisites:

in microeconomic theory (Varian, (2014), *Intermediate Microeconomics: A Modern Approach*, Ninth International Student Edition. WW Norton & Company, chapters 1 to 5)
in probability theory (Schinazi, (2011), *Probability with statistical applications*, Springer Science & Business Media). Students must be able to compute expected values for discrete and continuous random variables.

Main reference:

Eeckhoudt, Gollier, Schlesinger, 2005, *Economic and Financial Decisions under Risk*, Princeton UP

References:

Dixit, Pindyck, 1994, *Investment under Uncertainty*, Princeton UP,
Varian, 2014, *Intermediate Microeconomics: A Modern Approach*, Ninth International Student Edition. WW Norton & Company

Innovation & Intangible Asset Evaluation – 2 credits, 16 hours

Nathalie Sinclair Desgagné
Semester: 2
Location: PSE – Campus Jourdan

The course aims at providing students with an understanding of how intangible assets are included into economic decision-making and in particular, into economic impact assessments and cost benefit analyses. We will look at how, in practice, in the public and in the private sector, environmental and social impacts are quantified and sometimes monetized and what innovative tools have been produced to do so. The course will cover the variety of methods used to quantify and monetize these assets (stated-preference to revealed-preference). Once methods are covered, students will get to apply their knowledge and work on case studies.

Prerequisites: Cost Benefit Analysis and Econometrics and Data Analysis courses (both taught in Semester 1).

Macroeconomics – 2 credits, 18 hours

Patrick Artus
Semester: 1
Location: PSE – Campus Jourdan

Part 1: Monetary policy: contemporary theory

Introduction: the traditional monetary policy models (Barro, Gordon, etc.)

Chapter 1: Transparency

Should central banks be transparent on their objectives and policies and on the future economic situation?

Chapter 2: Uncertainty

How should central banks behave in the event of uncertainty about monetary policy transmission mechanisms?

Chapter 3: Deflation

What triggers deflation? What monetary policy in the event of deflation?

Chapter 4: Asset prices

Should central banks react to changes in asset prices? Monetary policy and bubbles.

Chapter 5: Delegation of objectives and externalities

Can the fact that the central bank's objective differs from the social objective be justified by (domestic or external) externalities.

Chapter 6: Fiscal policy and monetary policy

What leadership? Fiscal dominance, fiscal policy ensuring monetary solvency.

Prerequisite: knowledge of macroeconomics at the bachelor's level (for example Blanchard, Cohen).

Part 2: The choice of exchange rate regime

Chapter 1: Intermediate exchange rate regimes are unstable

The different balance of payments crisis models.

Chapter 2: The choice of exchange rate regime when only monetary policy is taken into account. Credibility; externality; currency war; symmetric and asymmetric shocks; the case of the euro zone: productive specialisation and currency areas.

Chapter 3: The choice of exchange rate regime when fiscal policy is taken into account. The conflicts between externalities (exchange rates, fiscal policies) and monetary coordination

Chapter 4: Impossible trinity, capital control. The return of capital controls to stabilise the international monetary system

Chapter 5: Are currency boards an efficient regime?

Chapter 6: Local currency debt - foreign currency debt (original sin). The choice between debt in local currency and in foreign currencies, and the consequences of the choice.

Prerequisite: knowledge of international economics e.g. a bachelor's degree (for example Krugman, Obstfeld).

Investment Decision - 3 credits, 24 hours
Dominique Jacquet
Semester: 1&2
Location: PSE – Campus Jourdan

The course introduces the main tools used by corporations to run the appraisal and control process of their industrial investment projects. It focuses on sensitivity analysis, risk and uncertainty, and their impact on value creation, mobilizing the real option theory and its applications. The application to R&D projects and "tech firms", such as biotech or social network-based business models, is addressed with real cases and examples.
The evaluation process consists in: a final exam for 70% of the grade and a personal case study work for the remaining 30%

Organizational & Managerial Practices – 2 credits, 16 hours
Hélène Bovais
Semester: 2
Location: PSE – Campus Jourdan

The aim of this course is to provide the students with the sociological knowledge and toolbox necessary to navigate in organizations, gain the support of key stakeholders and achieve their projects. It helps understand and thus, influence organizational functioning, decision making and collective action.
A mix of theoretical inputs, practical examples and games illustrates basic notions on human action in organizations, - whether individual or collective -, power, decision-making and control, as well as culture, cooperation and efficiency.
The students are also taught a method of organizational diagnosis called Strategic Analysis of Organizations (or stakeholders' analysis) useful for problem solving and change management. This method is applied on case studies and if possible, on the capstone projects.

Pre reading:
Organizations and collective action: our contribution to organizational analysis, by Michel Crozier and Erhard Friedberg, 1995

References:
Are we all lost in management? On Management Thinking Derailers, by François Dupuy, Diateino, 2018
Business for the 21st century: Towards Simplicity and Trust, by François Dupuy, Palgrave Macmillan, 2011, pp. 204
Actors and Systems. The Politics of Collective Action, by Michel Crozier and Erhard Friedberg, Chicago, The University of Chicago Press, 1980, (the French original published by Éditions Seuil in 1977), pp. VII + 333.
Power and Rules: The Organizational Dynamics of Collective Action, by Erhard Friedberg (Editor)

Finance & Corporate Finance – 2 credits, 16 hours

Thomas Cuignet
Semester: 2
Location: PSE – Campus Jourdan

This course will introduce students to Project Finance, as developed by lenders to finance long term infrastructure projects. This financing technic will be introduced in the context of Public Private Partnerships (PPP).
Students will develop their understanding of Project Finance, and the differences with corporate finance and other financing alternatives. Students will increase their knowledge of key stakeholders in a project, of the key project risks, and of the required risk allocation among parties. This will also give them a knowledge of how project finance models are built, and of the key ratios that should be met.

Structured finance – 2 credits, 16 hours

Henri Philippe
Semester: 1
Location: PSE – Campus Jourdan

The objective of the class is to provide students with the tools to assess the value of the firm financial resources.

The first sessions will be focused on the three main financial asset categories:
- Debt
- Equity
- Options

The understanding of the rational used to value those assets will provide the building blocks that will be used to understand and value more complex instruments (convertible bonds, hybrid debt, etc.). The use of option theory will also provide us a useful tool to understand the financial structure of the firm.

No particular prerequisites required. However, a basic knowledge of corporate finance will definitely help.

FIELD COURSES

Digital transformation

Platform Economics – 2,5 credits, 20 hours
Jean Beuve
Semester: 2
Location: PSE – Campus Jourdan

Description
The course aims to analyse the economic principles of platforms (two-sided and multi-sided markets). In the first part of the course, the basic concepts and principles of platform economics will be introduced and discussed. It will then consider the role of scale economies and network effects in determining the dynamics of platform competition and long-run industry structure. In the second part, value creation and ecosystem of platforms will be analysed both from theoretical and empirical perspectives, and also through examples of business models and competitive strategies of local and global companies. Finally, the course will derive implications for competition policy and regulation in two-sided markets with special focuses on the main challenges raised by platform economics (market dominance and merger control, role of data and privacy).

Expectations and Goals
After completing this class students should be able to: identify platforms / explain the functioning of a platform / identify network effects / evaluate direct and indirect network effects / analyse platform business models / evaluate platforms' behaviours / analyse platforms' competitive strategies

Some references:
- *Armstrong, M. 2006. Competition in Two-Sided Markets. RAND Journal of Economics 37, 668-91.*
  Belleflamme, P. and Peitz, M. (2010). Industrial Organization. Markets and Strategies. Cambridge : Cambridge University Press. Chapter 22. Section 3.
- *Caillaud, B. and Jullien, B. 2003. Chicken & Egg: Competition among Intermediation Service Providers. Rand Journal of Economics 34, 309-328.*
- *Evans, D.S. (2011). Platform Economics: Essays on Multi-Sided Businesses. Competition Policy International. Chapters 1 to 6.*
- *Rochet, J.-Ch., and Tirole, J. 2002. Cooperation among Competitors: Some Economics of Payment Card Associations. Rand Journal of Economics 33, 549-570.*

Data analytics – 2 credits, 15 hours
Marc-Arthur Diaye
Semester: 1
Location: PSE – Campus Jourdan

This course is an introduction to Data Analytics Methods and Technics. It starts with a scratch introduction to data analysis. It also covers data visualization and unsupervised learning models (PCA and Clustering). Applications and examples are developed using R and Dataviz software.

Disruptive Business Models – 2 credits, 15 hours
Henri-Paul Rousseau
Semester: 2
Location: PSE – Campus Jourdan

The course aims at providing a solid understanding in disruptive innovations and the way it is used and implemented by firms making distinctions between the challenges of incumbents as compared to the opportunities and risks of the "disruptors». The goal is to familiarize students with selected theoretical and empirical topics in disruptive innovations through the study of tools and methods used to detect disruptive changes and disruptive business models.

The courses is divided into three parts. The first part will cover the key components of business models, the main sources of innovative disruptions and their implications for both incumbents and disruptors .The second part will be a review of how multiples business sectors are impacted by disruptive new technologies and new regulations; the third part will focus on the sources , criteria and methods of the financing of disruptive business models both in the case of an incumbent putting in place a self -disruptive new business unit as well as in the case of a start-up disruptor. Students will be asked to apply these concepts and tools by preparing and presenting a Case Study.

Energy and Ecological Transition

Sustainable development and climate change economics- 2.5 credits, 20h
Katheline Schubert & Franck Lecocq
Semester: 1
Location: PSE – Campus Jourdan

Sustainable development is a broad-ranging concept rather than a narrowly defined field of study. As a result, this course is broad in scope, providing an overview of the underlying principles, beliefs and issues and their interconnections. But this course also addresses specific issues in economic/environmental sustainability such as the theory of natural non-renewable resources (with an emphasis on fossil fuels), the preservation of renewable natural resource stocks (fisheries, forests, water, biodiversity), the sustainable development indicators, both on a theoretical point of view and on an empirical one. The second part of this class will review the latest findings from climate change science, highlighting robust results and key uncertainties about the climate system, the impacts of climate change and the costs of action; provide an update on the current initiatives to address climate change (among others, existing schemes to manage greenhouse gas emissions and status of on-going post-Kyoto negotiations) and discuss how the economist toolbox (such as discounting, valuation of environmental resources or economic instruments to mitigate externalities) can provide insights on key decisions about the climate problem.

Energy economics – 2 credits, 15hours
Carine Staropoli
Semester: 1
Location: PSE – Campus Jourdan

This course aims at giving students an overview of the New Energy Economics (dealing with liberalized and globalized energy markets) focusing on the issue of infrastructure. It examines public policies affecting energy markets (especially gas and electricity) and infrastructure (generation mix and security of supply). Adopting an IO perspective, it presents the supply chain value of the gas and electricity system, the competition, the regulation and the new business models of these industries, so as to better understand the context of investment decision. It studies the future challenges of energy sector based on the innovations that will deeply transform offer and supply conditions of energy and impact investment decision (smart grids, big data, storage batteries for electricity, CO_2 capture and storage). CBA is often used in the energy sector but need to be adapted to the technical, regulatory, political specificities of the gas and electricity systems, notably when the projects are developed as demonstrators (typically for smart grid projects).

Reference:
Varian, (2014), *Intermediate Microeconomics: A Modern Approach*, Ninth International Student Edition. WW Norton & Company

Water, sanitation and waste management economics - 2 credits – 15 hours
Mouez Fohda and invited professors
Semester: 1&2
Location: PSE – Campus Jourdan

The course introduces theory, principles and techniques of economics relevant to solid waste and to water resources decision-making. The focus is on fundamentals of theory and their application to a range of challenges in solid waste and water resources management. The first part of the course provides an overview of the municipal solid waste management situation covering key elements of the waste management system, with its economic, environmental, financial and institutional aspects. The course will present the governance aspects of the municipal solid waste management system. It also covers public policy issues and the opportunities for a circular and green economy. The content of the second part of the course introduces to the subject of water economics. The course will provide a set of analytic tools that will be useful for water issues or natural resource issues more broadly. In particular, students will learn about non market valuation methods, water rights, water use and pricing, groundwater management, urban water use, and water markets. This will also show how economics is used in policy and cost-benefit analysis, the roles of water marketing and water pricing.

Healthcare in Ageing Societies

Health Economics – 2.5 credits, 20 hours

Pierre-Yves Geoffard, Lise Rochaix, Benedicte Apouey

Semester: 1

Location: PSE – Campus Jourdan

This course will be devoted to analysing the main determinants of recent trends in health status, the impact of recent reforms in health care systems and their social and economic consequences. It aims at both presenting the range of issues addressed in **health economics**, from efficiency to equity, from individual choices to public decision, from microeconomic decisions to global health and highlighting their **health policy** implications. The course will present recent methodological developments in health economics, based on econometrics and micro-simulations techniques. It will aim at showing the potential for application in the health care field, of models and tools developed in other fields such as labour economics, behavioural economics or industrial economics.

Textbooks

Handbook of Health Economics (2000), A. Culyer and J. Newhouse, eds., North-Holland

Elgar Companion to Health Economics (2006), A. Jones ed., Edward Elgar

Very selective bibliography

Arrow, Kenneth (1963), "Uncertainty and the welfare economics of medical care," American Economic Review, 53 (5): 941 – 73.

Grossman, Michael (1972), "On the Concept of Health Capital and the Demand for Health," Journal of Political Economy 80(2), pages 223-55.

Cutler, David, and Richard Zeckhauser (2000), "The anatomy of health insurance," in Handbook of Health Economics, North-Holland.

Ellis, Randall, and Thomas McGuire (1986), "Provider behaviour under prospective reimbursement : cost sharing and supply," Journal of Health Economics, 5 (2): 129-51.

Manning, W.G. et al. (1987). Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment. American Economic Review 77(3): 251-277.

Ellis, Randall, and Thomas McGuire (1990), "Optimal payment systems for health services," Journal of Health Economics, 9 (4): 375-96

Blomqvist, Ake (1991), "The doctor as double agent: information asymmetry, health insurance and medical care", Journal of Health Economics, 10(4), p411-432

Weisbrod, Burton (1991), "The Health Care Quadrilemma: An Essay on Technological Change, Insurance, Quality of Care, and Cost Containment," Journal of Economic Literature, June 1991, Vol. XXIX, pp. 523-552.

Newhouse, Joseph (1996), "Reimbursing health plans and health providers: efficiency in production versus selection," Journal of Economic Literature, 34(3): 1236 – 63.

Ma, Albert, and Thomas McGuire (1997), "Optimal health insurance and provider payment," American Economic Review 87: 685-704.

Glazer, Jacob, and Thomas G. McGuire (2000), "Optimal Risk Adjustment in Markets with Adverse Selection: An Application to Managed Care," American Economics Review, 90, 1055-1071.

Becker, Gary, Tomas J. Philipson and Rodrigo R. Soares (2005), « The Quantity and Quality of Life and the Evolution of World Inequality, » American Economic Review, Vol. 95, No. 1, March 2005

Murphy, Kevin M., and Robert H. Topel (2006), « The Value of Health and Longevity, » Journal of Political Economy, 114 ; 871–904

Aging and health – 2 credits, 15 hours
Benoit Rapoport
Semester: 2
Location: PSE – Campus Jourdan

The course will train students to the use of demographic statistics and data. It provides a comprehensive overview of the recent research on ageing indicators. It will be divided in two parts. The first part will analyse aging measures from an individual perspective. Life tables, healthy ageing and attitudes toward morbidity and mortality risks will be studied. The second part will be devoted to population ageing. Measures and controversies will be discussed and various forecasting methods will be presented.

Regulation in healthcare – 2 credits, 15 hours
Daniel Herrera
Semester: 2
Location: PSE – Campus Jourdan

The course aims at providing a solid grounding in understanding regulation in Health Care markets. The goal is to familiarize students with selected theoretical and empirical topics in health care. Case studies will be analysed during the course. At the end of the course, students will be able to underpin the economic reasons under which regulation in health might be justified and their implications. Case studies will provide a practical understanding of how health care regulations play out in a real-world environment.

References
On health economics/IO
Pauly, M V., Mcguire T G. and Barros, P P. (eds), Handbook of Health Economics, Volume 2, Elsevier, 2012.
On econometrics
Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton university press.

Smart cities

Transport Economics - 2 credits, 15 hours
Nicolas Coulombel
Semester: 2
Location: PSE – Campus Jourdan

This course aims to introduce students to transport economics, and to the use of cost-benefit analysis in the transport sector. The key notions of transport economics are first presented (e.g. travel demand, generalized cost of travel, value of time…). Then, students are taught how cost-benefit analysis puts all these notions to use. Several related issues are covered, such as the place of cost-benefit analysis in the design and evaluation of transport projects, governance…. The course addresses basic theoretical aspects as well as methodological aspects (travel demand modelling, emergence of big data in transport studies and in economic appraisal…). Several case studies are also discussed (Grand Paris Express, London's Crossrail…).

Pre-requisites
Knowledge in microeconomics &IO
Mathematical analysis: analytical functions, convex optimization, Lagrangian

References
Varian, (2014), *Intermediate Microeconomics: A Modern Approach*, Ninth International Student Edition. WW Norton & Company

Urban Economics – 2.5 credits, 20 hours
Camille Hemet, Laurent Gobillon
Semester: 2
Location: PSE – Campus Jourdan

This course provides an overview of urban economics and explains how to conduct local policy evaluation with the help of concrete examples drawn from the economic literature. The working of the city will be examined with stylized facts and lectures on agglomeration economies, urban mechanisms and equilibrium effects. Motivations for urban policies will then be developed and programs meant to foster development and help the poor will be discussed. An emphasis will be put on evaluation methods such as difference-in-differences and propensity score matching. Programs examined in more detail will include the implementation of enterprise zones, urban renovation tools, support for residential mobility, and transportation policies.

References:
Microeconomics theory, Mas-Colell
Econometric analysis, Greene
Econometrics analysis of cross-section and panel data, Wooldridge

Housing and Real Estate - 2 credits, 15 hours
Ingrid Nappi-Choulet
Semester: 2
Location: PSE – Campus Jourdan

This course aims to give an understanding of real estate market analysis and provide an economic perspective on markets to the real estate sector and industry, in the broader context of (global) real estate investment and development. The real estate sector represents a substantial share of the economy. Not only, will we discuss the economic and financial strategies of main key players in the real estate industry, but also the effects of financial, economical and management issues in the context of the interrelationship between property and business cycles.
The course will provide an historical and international context for these issues, including the major property booms and bust since late 1990s.
Students of this course will acquire a comprehensive understanding of property cycles.