Master 2 "Economics"
Track Economic Policy Analysis
Magistère option

- Field: Economics
- Duration of studies: 1 year
- Diploma: Master and Magistère
- Language: English

Aix-Marseille School of Economics
is a department of the Faculty of Economics and Management

SUMMARY

TERM 1

TERM 2

This brochure is not legally binding and is provided for information purposes. List of courses may change marginally from one academic year to the next.

WRITING AND ORAL COMMUNICATION TRAINING - 36H

TEACHERS
- Sebastian BERVOETS - sebastian.bervoets@univ-amu.fr
- Freelance journalist (professional)
- Teacher in English language (professional)

CONTENT
This course aims to develop / perfect the writing skills of students and their communication skills in both English and French. This teaching is very interactive by nature, where the objective is:
- to make individual oral presentations on various topics in front of the rest of the group,
- to write notes of synthesis allowing him to support his editorial capacities.

At the end of this course, the student will naturally build a structured and convincing discussion in front of an informed public.

Detailed course plan:
1st part: Writing expression
  1. How to write with simple and complex sentences and / or text rewriting workshop
  2. Being able to synthesize with reduction text exercise (from 7000 signs to 2000-500 signs) and / or writing summaries for different publics and / or principles of writing of synthesis

2nd part: Oral expression
  1. Principles of oral expression and construction of slides
  2. Short presentation workshop with and without support
  3. Contradictory presentation workshop in groups

PROFESSIONAL SKILLS
At the end of the course, students will know how to:
- write in a simple and clear way.
- make a complex readable text.
- to write a summary note.
- construct an oral presentation.
- express oneself in public.

ORGANIZATION
During this class, 8 hours will be dedicated to speaking and 6 hours to writing. The oral expression workshop will be delivered in French or English, depending on the native language of the student and the capacity of the groups.

COURSE LANGUAGE
☐ French   ☒ English

Updated on April 2021

PROJECT MANAGEMENT - 24H

TEACHER
- Freelance consultant/support for the design and management of international solidarity programs (professional)

CONTENT
This course aims at training students to conceive development projects. It is based on the study case of a real PCM process.

Detailed course plan:
- Session 1: PCM; Presentation of the study case: applicant NGO, field partners, guidelines, grant application form…
- Session 2: Participation to the identification process of a real development project: from the focus group to the problem tree co construction
- Sessions 3 and 4: Participation to the formulation process of a real development project: from the objective tree to the logical framework
- Sessions 5 and 6: Participation to the budgeting process of a real development project: from the intervention logic to the concept note and figures
- Session 7: Evaluation of the project

PROFESSIONAL SKILLS
Relevance, efficiency, team working, express oneself in public.

BIBLIOGRAPHY AND TEXTBOOKS
- EC Aid delivery methods: project cycle management guidelines
- The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet. Synthesis Report of the Secretary-General on the Post-2015 Agenda

ORGANIZATION
In line with the Master 1 PCM course, students will be conducted to participate in the actual conception of a development project lead by a French NGO.

COURSE LANGUAGE
☐   French   ☒   English

Updated on September 2022

QUANTITATIVE TOOLS IN ECONOMICS - 24H

TEACHERS
- Frédéric RYCHEN - frederic.rychen@univ-amu.fr
- Commissariat à l'énergie atomique et aux énergies (CEA) (professional)

CONTENT
The objective is to introduce various tools used to build economic analysis, and decision-making. Two main approaches are introduced: Cost-Benefit Analysis and simulation models. The main principles of each method will be discussed, following the objective that students will be able to implement them in their job.

Course outline:
Part I: Cost-Benefit Analysis
- Chapter 1: Introducing CBA
- Chapter 2: Valuing benefits and costs in primary markets
- Chapter 3: Valuing secondary markets
- Chapter 4: Benefits and costs in future time periods
- Chapter 5: Dealing with uncertainty, expected values, sensitivity analysis, and the value of information
- Chapter 6: Shadow prices from secondary sources

Part II: On the energy scenarios: How to produce them? To use them? What are their limits?
- Chapter 1: Introduction on prospective and scenarios methods
- Chapter 2: The energy transition in France

PROFESSIONAL SKILLS
At the end of the course, the student will be able to:
- Understand the different stage of a Cost-Benefit Analysis,
- and implement a Cost-Benefit Analysis,
- Adapt a Cost-Benefit Analysis to the specific context of the project or policy considered,
- Discuss results,
- Build scenarios,
- Discuss advantages and drawbacks of the two approaches.

BIBLIOGRAPHY AND TEXTBOOKS
- Cost-benefit analysis, A.E. Boardman, D.H. Greenberg, A.R Vining and D.L Weimer, Prentice Hall- Pearson, 2011.
- Pricing nature, N. Hanley and B. Barbier, Edward Elgar, 2009.

ORGANIZATION
The course is organized in 8 teaching slots, 20h devoted to cost-benefit analysis, and 4h devoted to scenarios. During these slots, main concepts are presented, and students have to solve practical problems.

COURSE LANGUAGE

☐ French ☒ English

FUNDAMENTAL PREREQUISITES
Reference models in Microeconomics, industrial economics, public economics.

RECOMMENDED PREREQUISITES
Environmental economics, health economics, numerical tools.

Updated on April 2021

ECONOMETRICS OF IMPACT ASSESSMENT - 24H

TEACHER
- Habiba DJEBBARI - habiba.djebbari@univ-amu.fr

CONTENT
The objective is to provide students with tools for conducting and assessing evidence-based policy. Considered as a second course on evaluation, this course will start with a refresher on standard evaluation methods (including randomized experiments, difference-in-difference). In a second stage, we provide more extensive treatment of other commonly used methods (IV, regression discontinuity). In the third and last section, we present the main requirements for transparent and reproducible research. We illustrate each topic with relevant applied articles from the existing literature in development, environmental, housing and health economics.

Course outline:
Part 1: Refresher on RCT and DiD
Part 2: Other evaluation methods (RD, IV, matching, synthetic methods…)
Part 3: Transparent and reproducible research

PROFESSIONAL SKILLS
As a result of this course, students are expected to be able to understand, explain and compile evidence from the evaluation of public policies and guide public action.

BIBLIOGRAPHY AND TEXTBOOKS
Parts 1 and 2
- Blundell R. and M. Costa Dias (2009): « Alternative Approaches to Evaluation in Empirical Microeconomics », Journal of Human Resources, 44 (3), 565-640.
- Heckman, James, Robert LaLonde and Jeffrey Smith (1999): The Economics and Econometrics of Active Labor Market Programs. In Orley Ashenfelter and David Card, eds., Handbook of Labor Economics, Volume 3A. Amsterdam: North-Holland. 1865-2097.
- Imbens, G., Wooldridge J. M., (2009) Recent developments in the econometrics of program evaluation, Journal of Economic Literature, 47, 5-86.

Application papers: TBA
Part 3: Christensen, Garret, Jeremy Freese, and Edward Miguel. *Transparent and reproducible social science research*. University of California Press, 2019.

ORGANIZATION
24-hours course, 3 hours per week over 7 weeks.

COURSE LANGUAGE
☐ French ☒ English

FUNDAMENTAL PREREQUISITES
Graduate econometrics, use of statistical analysis software.

Updated on September 2021

APPLIED ECONOMICS ISSUES - 24H

TEACHER
- Marion DOVIS - marion.dovis@univ-amu.fr

CONTENT
The objective of the course is to train students to think as economists. To this end, the course choses to focus on different topics of a specific developing region, the middle east and north African region. Around specific concerns in the Mediterranean region, we will develop student's critical thinking skills and allow them to analyse information on a given subject or recent events (eg. Arab spring, women empowerment, etc.). The topics are of interest to many but should be seen as tools to serves the purpose of the intellectual exercise of studying a phenomenon using economic thinking. This course will provide students with a general knowledge of advanced economics while using underlying theoretical concepts.

Course outline:
Introduction - Main issues in the Mediterranean countries
Part 1: Resources allocation in MENA
- 1.2 Openness to trade and Development
- 1.3 Private sector: What's holding back in the region?
- 1.4 Women entrepreneurship and empowerment
Part 2: The Arab spring
- Facts and empirics on institutional change and development
- 2.2 Benchmark theories: democratization games
- 2.3 Understandings the Arab spring

PROFESSIONAL SKILLS
- Understand the politico-economic mechanisms leading to political transitions.
- Learning to go from observation of real phenomena to models and vice-versa.

BIBLIOGRAPHY AND TEXTBOOKS
A detailed reference list will be provided in the first day of lectures.
- Boucekkine, R., F. Prieur & K. Puzon, 2014a. On political change in Arab countries, AMSE WP 2014-1.
- Boucekkine, R., F. Prieur & K. Puzon, 2014b. The dynamics of lobbying under uncertainty: On political liberalization in Arab countries, in: Dynamic Games in Economics.

ORGANIZATION
Each lecture will take 3 hours, with a total of 24 hours. Students are expected to read the articles or report before each lecture.

COURSE LANGUAGE
☐ French ☒ English

FUNDAMENTAL PREREQUISITES
The prerequisites courses include Advanced Microeconomics and Advanced Macroeconomic.

Updated on April 2021

BIG DATA AND ECONOMICS - 24H

TEACHERS
- Assistance publique Hôpitaux de Paris (professional)
- ECIJA law firm (professional)

CONTENT
The objective is to introduce several questions associated with the use of big data in order to understand the context, impacts and limits of this new technology. Particular issues will be presented to students: e.g. access, security, innovation and opportunities in order to specifically identify how big data can boost local development, and allow to design new public policies.

Course outline:
Part I: Data and local development
  1. Open data, Smart Region and innovation
  2. Contracts and legal aspect of the platform FlexGrid, a tool for energy transition
Part II: Big data and security
  1. Public security and cities security
  2. Cybersecurity
Part II: Big data, a decision-making support

PROFESSIONAL SKILLS
- Analyze a specific issue,
- Identify the means of data,
- Identify how to use a particular tool to a specific question in order to improve a decision,
- General knowledge on legal and economic aspect associated with the use of big data.

ORGANIZATION
The course spans 24h, and different professional speakers will introduce the specific topics, either by slots of 3h, or an all-day lecture.

COURSE LANGUAGE
☐   French   ☒   English

FUNDAMENTAL PREREQUISITES
Public economics, economic analysis.

RECOMMENDED PREREQUISITES
Big data initiation.

Updated on April 2021

TRANSITIONS AND ECONOMIC POLICIES - 24H

TEACHERS
- Banque de France (professional)
- UNU-MERIT and Maastricht University (professional)

CONTENT
Against the backdrop of the recently introduced Anti-Waste and Circular Economy Law (2020), in two days, we will examine the design and potential impact of the repairability index by going through all major stages of a discrete choice experiment (DCE).

In Day 1, we will start with an introductory lecture on DCE. We will discuss the potential of DCE by comparing it with other traditional impact evaluation techniques such as randomized control trials. After that we will design a DCE together, going through the experimental design, questionnaire design and online setup. Our target is to come up with a ready-to-go survey so that you and your friends can fill in the survey and provide data for the activities in Day 2.

We kick start Day 2 with a mini lecture on random utility theory. The knowledge will prove to be essential in understanding how the data set should be structured and analyzed. By this time, you will understand better why a rather simple looking logistic regression model can inform us how people valuate things. We will then spend time to prepare the data for analysis. This is the time to apply your Stata skills to clean and re-structure the data to make them fit for further data analysis. We will then analyze the data and conclude by discussing our findings related to the value and/or design of the repairability index and reflecting on the original survey design.

After completing this part of the course, students will be able to design a discrete choice experiment, conduct it in an online environment, analyze survey data, and provide recommendations to firms or policymakers based on the findings. Students will also have ample opportunities to apply and sharpen their data management skills using Stata. At a more general level, students should be able to reflect on the possibilities and limitations of the method.

Course overview:
DAY 1
- **Lecture (1 hour)**

What are discrete choice experiments (DCE)? How may we assess the impact of the repairability index on green transitions? What kind of questions can and cannot be answered by DCE?
- **Session 1: Identify Objective (0.5 hours)**

We will come up with a question answerable with DCE.
- **Session 2: Experiment Design (2 hour)**

We will identify relevant attributes and levels, and then decide what to keep in the survey. We will also discuss issues related to label and visual display.
- **Session 3: Questionnaire Development (1 hour)**

We add additional questions to the survey. Other practical issues such as the number and sequence of questions will also be covered.
- **Session 4: Final Preparation (1-2 hours)**

It is time to set up randomization on Qualtrics. We will also prepare a consent statement and conduct a pilot study. We will also talk about sampling strategy and how to distribute online surveys.
- **Data Collection (overnight)**

DAY 2
- **Session 5: Random Utility Theory (1 hour)**

It is not so straightforward to see why a simple logit model can tell us how people valuate certain things. Some knowledge about the theory is going to help us understanding how to analyze the data. The data downloaded from Qualtrics are not yet ready for analysis. We need to reshape the data in a way that fits the command that everyone knows. An understanding of the theory will shed us some light on how the data set should look like.
- **Session 6: Data Restructuring (2-3 hours)**

Once we know how the data should look like, we are ready to make our hands dirty. The seemingly simple task could be daunting. You think you are good at Stata? This is the time to test it.
- **Session 7: Data Analysis and Interpretation (2 hours)**

Time to run the model now. We will estimate the willingness to pay and use the estimation results for some scenario comparison. Note that they may not make perfect sense given our research objective and experimental design. But at least you know the steps and can apply them when they are appropriate.
- **Session 8: Final Discussion (1 hour)**

We will also discuss our findings related to the value and/or design of the repairability index. To what extent can information induce behavioural changes? Finally, we will have had relatively little time to design our experiment. Things may go wrong in the design process that makes the design not measure up to our objectives. It is time to reflect on the original survey design and propose ways to improve it.

BIBLIOGRAPHY AND TEXTBOOKS

Please complete the readings before our first-day meeting. Readings 1 and 2 are webpage, which you can finish in 10 minutes. Reading 3 introduces what discrete choice experiments are. Reading 4 (section 4 only) will become handy in Session 2 (see the Schedule below) when we finalize the choice sets. Reading 5 is particularly useful in Sessions 2, 5 and 7, when we set up an achievable objective and analyze our data. An understanding of the random utility theory will help you makes sense of the estimation.

As the starting point, we often assume that economic agents are rational, and that people will react to information from a label or an index positively. But what are the missing links which would imply that a simple repairability index may not do the magic? Reading 6 will give us some additional food for thoughts. It is optional as we may not have time to cover that during session 8.

1. The Ellen MacArthur Foundation (2021) France's Anti-Waste and Circular Economy Law.
2. The Right to Repair (2021) The French repair index: challenges and opportunities.
3. OECD (2018). Cost-Benefit Analysis and the Environment. Chapter 5. Discrete choice experiments. OECD, Paris.
4. Sanko, N. (2001) Guidelines for Stated Preference Experiment Design. Section 4 Factorial Design.
5. Pepermans, G. (2014). Valuing smart meters. *Energy Economics*, 45, 280-294.
6. (Optional) Nachreiner, M., Mack, B., Matthies, E., & Tampe-Mai, K. (2015). An analysis of smart metering information systems: a psychological model of self-regulated behavioural change. *Energy Research & Social Science*, 9, 85-97.

ORGANIZATION

For this part of the course, there are two grading components: Participation (30%) and one Written Report (70%). The sessions are highly interactive and require constant inputs from students. The participation grade is based on whether students actively engage in class activities and their contributions to the discussion during the two days.

The report is individual based. Students are asked to, based on the empirical findings of the DCE, discuss one further action which they can take to advance the position of a (hypothetical) organization of your choice. It can be a private firm in a specific sector (e.g., electronic appliance manufacturing or retail, plastic materials, clothing, you name it), an (International) NGO, a social enterprise, or a government body, in a selected country of your choice.

The report should have the following structure:

a) Description

Give your readers further information about the organisation. It can be a real enterprise (e.g., Carrefour, Schneider Electric), but please do not assume that your readers know the organisations by their names. What is the nature of the business or (public) services the organisation provides? What is the country of origin of the organisation? It could be a local firm, a multinational corporation, or a government body, for example.

b) Implications

In which way the repairability index is related to the selected organisation? Highlight a relevant finding from the DCE. (This could be based on some further analysis; but this is not strictly required. Shall you choose to do so, please provide some further details about the extension in an appendix). Discuss the implications of the findings to the organisation.

Note: Image you are trying to make a new proposal to your job supervisor. You need to briefly explain what you find and the implications of it to your organisation, your department and/or your team. Be concise and to the point. Avoid jargons and technical details. They are not interested in the details of DCE or how you find them. They just want to know the importance of the findings. What do they need to know? Why do they need to know that? These two guiding questions will help you determine what (not) to put in this section of the report.

c) Recommendation

You got your supervisors' attention. They saw the relevance and an opportunity. But what should be done next? Pitch your idea here. New follow-up studies? Revision of the index? Redesign of a product? The recommendation needs to be specific and relevant to the findings. Some details are required so that your readers can appreciate your brilliant idea, but excessive details are discouraged. So long as the purpose and the idea are sufficiently clear, such that your friends or partner can understand and see the point, that's enough (i.e., to the point that they stop asking you "what does it mean" and "so what?"). The report should have **1000 to 1500 words**, excluding appendix and references, if there are any. Please include your name, your ID and word count in your submission. The submission deadline is **Friday 11 November**.

COURSE LANGUAGE

☐   French   ☒   English

Updated on October 2022

ECONOMICS, FINANCE AND CRISES - 24H

TEACHER
- Marco FONGONI - marco.fongoni@univ-amu.fr

CONTENT
Using both empirical evidences and theoretical concepts, this course aims at explaining how economic and financial issues are closely related, and how shocks and crises can propagate. It also explains the interactions between financial markets and economic cycles (in light of the recent crises).

Course outline:
- Empirical Evidence on Financial Crises
- Financial frictions
- The financial crisis of 2006-2009
- Unconventional monetary policy
- European Sovereign Debt Crisis Discussion

PROFESSIONAL SKILLS
Good knowledge of the effects of financial frictions on the economy.

BIBLIOGRAPHY AND TEXTBOOKS
- Bernanke, B. S., Gertler, M., and Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. In Taylor, J. B. and Woodford, M., editors, Handbook of Macroeconomics, volume 1, chapter 21, pages 134-1393.
- Bernanke B. (2013). The Federal Reserve and the Financial Crisis. Princeton University Press.

ORGANIZATION
This course covers several topics, each topic being used as a support to introduce key theoretical concepts.

COURSE LANGUAGE
☐ French ☒ English

FUNDAMENTAL PREREQUISITES
Good knowledge in macroeconomics and econometrics.

Updated on April 2021

PROGRAMMING FOR BIG DATA (PYTHON, SQL, NOSQL, ETC) - 24H

TEACHERS
- Airbus Helicopters (professional)
- CCI Aix Marseille Provence (professional)

CONTENT
This course is aimed at teaching the basics of computer programming, with emphasis on its use in Big Data. Students will first become familiar with database management. They will then learn the basics of programming with the computer language Python.

Course outline:
1. Database Management (relational model, relational algebra, SQL language…)
2. Introduction to Python
3. Creating Functions
4. Introduction to Numpy
5. Data manipulation with Pandas
6. Visualization
7. Parallel programming

PROFESSIONAL SKILLS
- Being able to create a database and query it to extract information.
- Knowing how to load data into Python, manipulate it and format it.
- Being able to understand and use functions from Python libraries.
- Acquire knowledge on distributed computing.

BIBLIOGRAPHY AND TEXTBOOKS
- Rockoff, L. (2016). The language of SQL. Addison-Wesley Professional.
- VanderPlas, J. (2016). A Whirlwind Tour of Python. O'Reilly Media, Inc.
- Lutz, M. (2013). Learning Python: Powerful Object-Oriented Programming. O'Reilly Media, Inc.
- https://www.python.org/

ORGANIZATION
Sessions alternating theoretical presentations and applications.
The applications will be carried out on computers.

COURSE LANGUAGE
☐   French   ☒   English

Updated on April 2021

DEVELOPMENT ECONOMICS - 24H

TEACHER
- Roberta ZIPARO - roberta.ziparo@univ-amu.fr

CONTENT
This course is meant to train students on recent topics in development economics bridging the gap between theoretical and empirical research and the implementation of public policy to eradicate poverty. In this sense, the course will allow the students to apply the analytical tools they acquired during the first year of the master to specific questions and to relate them to targeted policies and their effectiveness.

This course will focus on *microeconomic issues*, seeking to understand the factors and constraints influencing individual-level, household-level, or firm level decision-making in developing countries. We will cover a series of broad topics.

The first will concern human capital. Health and education are desirable per se, but they are also important determinants of productivity and of fertility levels (and of each other). What prevents poor households from becoming healthier and to acquiring more education? Why are girls often at a disadvantage within the household? What policies can improve health and education levels in developing countries?

The second broad topic will concern financial capital. Most people in developing countries are self-employed earning highly irregular income, either a daily profit in the informal sector when business is good or only realizing income once or twice a year in farming when the harvest is good. How do households deal with such irregular income? Can they borrow and save, and if not why not? How and how well do informal insurance networks work? Is microfinance the solution to all problems?

We will also consider the importance of physical capital. Since the majority of poor households live in rural areas, agricultural productivity is central determinant of income for most of the world' poor. How do the land distribution, property rights and access to technology matter for agricultural productivity?

To summarize, the course will cover complementary topics in the development literature linking relevant econometric techniques and theoretical models to the implementation of relevant public policies.

Course outline:
The detailed list of the topics covered (and the related plan of the course) is the following:
INTRODUCTION
- What is economic development? Measuring poverty.

HUMAN CAPITAL
1. Determinants of health: the household behaviour
- Nutrition based poverty traps
- Adoption and use of health products
2. Education:
- The demand for education and child labour
- The returns to education
3. Fertility, gender gaps and
- The determinants of fertility choices and the missing women
- Intra-household decision making

FINANCIAL CAPITAL
1. Microfinance and micro-savings
- Access to credit in poor countries
- Why don't the poors save more?
2. Coping with risk
- Income risk and agricultural production
- Informal safety nets

PHYSICAL CAPITAL
- Property rights and technology adoption
- Property right and farm productivity
- Technology adoption and information

PROFESSIONAL SKILLS
- Being able to understand and replicate simple theoretical models applied to core issues of development economics.
- Being able to understand and replicate simple econometric analysis to analyse core issues of development economics.
- Being able to understand how to test relevant theoretical model through econometric techniques.
- Being able to link the economic analysis of development issues to the design and implementation of effective public policies.

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BIBLIOGRAPHY AND TEXTBOOKS

Textbooks

- Understanding Poverty, A. Banerjee, R. Benabou, and D. Mookherjee, editors, Oxford University Press: March 2006.
- Development Economics by Debraj Ray.

Introduction + Topic 1.1

- UP Chapter 1 (Angus Deaton): "Measuring Poverty" (12 pages) note: available online for those who are still in the process of ordering books.
- Banerjee et al. (2015). "A Multi-faceted Program Causes Lasting Progress for the Very Poor: Evidence from Six Countries" (May 2015) Science, 348(6236), pp. 772.
- Dasgupta, Partha and Debraj Ray (1986), "Inequality as a Determinant of Malnutrition and Unemployment: Theory," Economic Journal 96 (384): 1011-1034.
- Jensen, Robert and Nolan Miller (2011). "Do Consumer Price Subsidies Really Improve Nutrition?" Review of Economics and Statistics, 93(4), p. 1205-1223.
- Haushofer, Johannes and Jeremy Shapiro (2016). "The Short-Term Impact of Unconditional Cash Transfers to the Poor: Evidence from Kenya". Quarterly Journal of Economics. 131(4), 1973–2042.

Topic 1.2

- Section 5 in: Dupas, Pascaline, and Ted Miguel (2016). "Impacts and Determinants of Health Levels in Low-Income Countries," Handbook of Field Experiments, Eds. A. Banerjee and E. Duflo.
- Dupas, Pascaline (2014). "Short-Run Subsidies and Long-Run Adoption of New Health Products: Evidence from a field experiment". Econometrica.
- Cohen, Jessica, and Pascaline Dupas (2010). "Free Distribution or Cost-Sharing? Evidence from a Randomized Malaria Prevention Experiment." Quarterly Journal of Economics, 125(1): 1-45.
- Ashraf, Nava, James Berry and Jesse Shapiro. (2010). "Can Higher Prices Stimulate Product Us? Evidence from a Field Experiment in Zambia." American Economic Review 100: 2383-2413.
- Dupas, Pascaline (2009). "What matters (and what does not) in households' decision to invest in malaria prevention?" American Economic Review, 99(2): 224-30.
- Cohen, Jessica, Pascaline Dupas and Simone Schaner (2012). "Price Subsidies, Diagnostic Tests, and Targeting of Malaria Treatment".
- Field, Erica, Rachel Glennerster and Reshma Hussam (2011). "Throwing the Baby out with the Drinking Water: Unintended Consequences of Arsenic Mitigation Efforts in Bangladesh". Working paper.

Topic 2.1

- Attanasio, Orazio, Costas Meghir and Ana Santiago (2012). "Education Choices in Mexico: Using a Structural Model and a Randomized Experiment to Evaluate Progresa". Forthcoming in Review of Economic Studies.
- Jensen, Robert (2012). "Do Labor Market Opportunities Affect Young Women's Work and Family Decisions? Experimental Evidence from India". Quarterly Journal of Economics 127(2), p. 753-792.
- Jensen, Robert (2010). "The (Perceived) Returns to Education and the Demand for Schooling," Quarterly Journal of Economics, 125(2), p. 515-548.
- Benhassine, Najy, Florencia Devoto, Esther Duflo, Pascaline Dupas and Victor Pouliquen (2015). "Replacing the Shove with a Nudge: A Small Unconditional Transfer for Education". AEJ Economic Policy.

Topic 2.2

- 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. « The Medium Run Effects of Educational Expansion: Evidence from a Large School Construction Program in Indonesia. » Journal of Development Economics 74, no. 1 (2004): 163-197.
- Bills, Mark, and Pete Klenow. « Does Schooling Cause Growth? » The American Economic Review 90, no. 5 (2000): 1160-1183.
- Foster, Andrew D. and Mark R. Rosenzweig (1996). "Technical Change and Human-Capital Returns and Investments: Evidence from the Green Revolution" The American Economic Review, 86(4): 931-953.
- Ozier, Owen (2016). "The Impact of Secondary Schooling in Kenya: A Regression Discontinuity Analysis". Journal of Human Resources, forthcoming.
- Psacharopoulos, George (1994), "Returns to Investment in Education: A Global Update," World Development 22(9): 1325-1343.
- Rosenzweig, Mark (1995), "Why Are There Returns to Schooling?" American Economic Review P&P 85(2): 153-158.
- Munshi, Kaivan, and Mark Rosenzweig (2006). "Traditional Institutions Meet the Modern World: Caste, Gender, and Schooling Choice in a Globalizing Economy." American Economic Review 96(4): 1225-1252.

Topic 3.1

- Amartya Sen, "More Than 100 Million Women Are Missing," New York Review of Books 37(2), December 20, 1990.

- Eliana Carranza (2014) "Soil Endowments, Female Labor Force Participation, and the Demographic Deficit of Women in India" AEJ applied Vol. 6, Issue 4 -- October 2014.
- Nancy Qian (2008). "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Income on Sex Imbalance," The Quarterly Journal of Economics, 123(3), August 2008.
- Chattopadhyay, Ragabhendra, and Esther Duflo (2004). "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India". Econometrica. Vol. 72, No. 5.
- Jayachandran, Seema, and Ilyana Kuziemko (2011). "Why Do Mothers Breastfeed Girls Less Than Boys? Evidence and Implications for Child Health in India", Quarterly Journal of Economics, 126(3), August 2011, pp. 1485-1538.
- Pauline Rossi and Léa Rouanet (2015). "Gender Preferences in Africa: A Comparative Analysis of Fertility Choices". World Development, Vol. 72, pp.326-345, 2015.
- Lori Beaman, Esther Duflo, Rohini Pande and Petia Topalova (2012). "Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India".
- Elaina Rose (1999). "Consumption Smoothing and Excess Female Mortality in Rural India." Review of Economics and Statistics 81, no. 1: 41-49.

Topic 3.2
- Ashraf, Nava, "Spousal Control and Intra-Household Decision Making: An Experimental Study in the Philippines." American Economic Review.
- Ashraf, Nava, Erica Field, and Jean Lee. "Household Bargaining and Excess Fertility: An Experimental Study in Zambia." American Economic Review.
- Anderson, S., and J.-M. Baland. 'The Economics of Roscas and Intrahousehold Resource Allocation". Quarterly Journal of Economics, 117(3): 963-95.
- Doepke, M., and M. Tertilt (2014). 'Does Female Empowerment Promote Economic Development?'.
- Guirkinger, C., and J.P. Platteau (2015). 'Transformation of the Family under Rising Land Pressure: A Theoretical Essay'. Journal of Comparative Economics, 43(1): 112-37.

Topic 4.1
- Robert Cull, Asli Demirgüç-Kunt and Jonathan Morduch (2009). "Microfinance Meets the Market". February 2009. Journal of Economic Perspectives 23(1), Winter: 167-192.
- Erica Field, Abraham Holland and Rohini Pande (2014). "Microfinance: Points of Promise."
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Topic 4.2
- Gugerty, Mary Kay (2007), "You Can't Save Alone: Commitment in Rotating Savings and Credit Associations in Kenya." Economic Development and Cultural Change 55 (2007): 251-282.
- Dean Karlan, Aishwarya Ratan, Jonathan Zinman (2014). "Savings By and For the Poor: A research review and agenda". Review of Income and Wealth, 60(1), pp. 36-78.
- Dupas, Pascaline and Jonathan Robinson (2013). "Why don't the poor save more? Evidence from health savings experiments". American Economic Review, 103(4), pp. 1138-71.
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Topic 5.1
- Udry, Christopher (1990), "Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy." World Bank Economic Review 4(3): 251-269.
- Karlan, Dean, Robert Osei, Isaac Osei-Akoto and Christopher Udry (2013), "Agricultural Decisions after Relaxing Credit and Risk Constraints." Quarterly Journal of Economics.
- Cole, Shawn et al. (2013), "Barriers to Household Risk Management: Evidence from India." American Economic Journal: Applied Economics 5(1): 104-35.

Topic 5.2
- Dercon, Stefan (2002), "Income Risk, Coping Strategies, and Safety Nets." World Bank Research Observer 17(2): 141-166.
- Townsend, Robert (1994), "Risk and Insurance in Village India." Econometrica 62(3): 539-591.
- Ambrous, A., M. Mobious, AND A. Szeidl (2014): "Consumption Risk-Sharing in Social Networks," American Economic Review, 104(1), 149-182 [677].
- Fafchamps, M., and S. Lund (2003): "Risk Sharing Networks in Rural Philippines," Journal of Development Economics, 71, 261-287 [675,682].
- Foster, A. D., and M. R. Rosenzweig (2001): "Imperfect Commitment, Altruism, and the Family: Evidence From Transfer Behavior in Low-Income Rural Areas," Review of Economics and Statistics.

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Topic 6.1
- Woodruff, C. (2001), "Review of de Soto's The Mystery of Capital", Journal of Economic Literature 39(4), 1215-1223. (9 pages)
- Udry, Christopher (2011). "Land Tenure", in Ernest Aryeetey, Shantayanan Devarajan and Ravi Kanbur, eds. The Oxford Companion to the Economics of Africa, 2011 (6 pages).
- Allendorf, Keera (2007). "Do Women's Land Rights Promote Empowerment and Child Health in Nepal?" World Development 35(11): 1975-1988. (13 pages).
- Field, Erica, and Maximo Torero (2006). "Do Property Titles Increase Credit Access Among the Urban Poor? Evidence from a Nationwide Titling Program." Working paper.
- Sebastian Galiani and Ernesto Schargrodsky (2010). "Property rights for the poor: Effects of land titling". Journal of Public Economics.
- Entitled to Work: Urban Tenure Security and the Labor Supply in Peru, Quarterly Journal of Economics, November 2007, 4(122): 1561-1602.
- Gollin, Doug, David Lagakos and Mike Waugh (2012) "The Agricultural Productivity Gap in Developing Countries". Quarterly Journal of Economics.
- Goldstein, Markus, and Chris Udry (2008). "The Profits of Power: Land Rights and Agricultural Investment in Ghana," Journal of Political Economy, December 2008.

Topic 6.2
- Kyle Emeick, Alain de Janvry, and Elisabeth Sadoulet and Manzoor H. Dar (2016). Technological innovations, downside risk, and the modernization of agriculture, American Economic Review.
- Suri, Tavneet (2011). "Selection and Comparative Advantage in Technology Adoption", Econometrica, 79(1), pp. 159-209.
- Duflo, Esther, Michael Kremer and Jonathan Robinson (2011), "Nudging Farmers to Use Fertilizer: Theory and Experimental Evidence from Kenya" American Economic Review 101(6): 2350-2390.
- Aker, Jenny C. (2010). "Information from Markets Near and Far: The Impact of Mobile Phones on Grain Markets in Niger". American Economic Journal: Applied Economics 2(3): 46-59.
- Aparajita Goyal (2010). « Information, Direct Access to Farmers, and Rural Market Performance in Central India » American Economic Journal: Applied Economics.
- AD Foster, MR Rosenzweig, "Microeconomics of technology adoption" Annual Review of Economics.
- O Bandiera, I Rasul "Social networks and technology adoption in northern Mozambique".

ORGANIZATION
The course will consist of 8 lectures of 3 hours.

COURSE LANGUAGE

☐ French ☒ English

Updated on April 2021

HEALTH ECONOMICS - 24H

TEACHERS
- Alain PARAPONARIS - alain.paraponaris@univ-amu.fr
- Bruno VENTELOU - bruno.ventelou@univ-amu.fr

CONTENT
This course proposes a balanced approach of health economics based on both theoretical and empirical considerations. It deals with the study of the main stakeholders' economic behaviours of the health sector: patients, health professionals (physicians and hospitals), health insurance, companies producing health goods or pharmaceuticals and health authorities. It invites to reconsider some of the basic concepts in economics (supply and demand, public intervention, uncertainty, information asymmetries, incentives, etc.) and models (growth models and human capital, labour supply, etc.), for a deep understanding of the phenomena at work in the sector. Thus, the course is likely to meet the expectations from students willing to specialise in the analysis of the health sector as well as students interested in illustrations of concepts and mechanisms derived from the economic theory.

Course outline:
General introduction (2h-BV)
Part 1. Micro foundations (8h)
Chap 1 The demand for health and healthcare (4hBV)
- Introducing health in the utility function and deriving healthcare demand: presentation of several options
- The demand for healthcare using the concept of health-capital (Grossman, 1972)
- Empirical illustration

Chap 2 Health supply (4h-AP)
- Self-employed physicians
- Modelling Quality
- Payment schemes
- Empirical illustration

Part 2. Health macroeconomics (8h)
Chap 3 Health as an economic sector (5h-AP)
- Health sector contribution to GDP and growth in France and other OECD countries
- The irresistible growth of the health sector in the economy (health as a luxury or a necessity good?)
- Innovation in the health sector
- Empirical illustration

Chap 4 Health, development and growth (3h-BV)
- A health-augmented Solow-model
- Health and the development process, the Sachs report & the econometrics of the health/growth relationship
- The burden of diseases in Africa and the notion of "Universal Health Coverage"
- Modelling health in a macroeconomic design: epidemic traps
- Empirical illustration

Part 3. Topics (6h)
Chap 5 Public regulations in the healthcare market
- Measuring and reducing social inequalities in health (3h-BV) Empirical illustrations
- Information asymmetries in health insurance (3hAP)
- Adverse selection in insurance companies' plans
- Moral hazard and healthcare consumption

PROFESSIONAL SKILLS
- Analytical capabilities in health economics.
- Transferring knowledge to others (noneconomists).
- Ability to combine theoretical modelling and empirical analysis.
- Identifying the appropriate estimation strategy.
- Data creation/collection, handling datasets for health economics purposes.

BIBLIOGRAPHY AND TEXTBOOKS
- Bras PL, de Pouvourville G, Tabuteau D. Traité d'économie et de gestion de la santé, Presses de Sciences Po, 2008.
- Culyer AJ, Newhouse JP (editors). Handbook of health economics, volumes 1A and 1B, North Holland, 2000.
- Folland S, Goodman AC, Stano M. The economics of health and health care, Pearson, 7th edition, 2013.

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- Jones AM. The Elgar companion to health economics, Edward Elgar, 2006.
- Jones AM. Applied econometrics for health economists: a practical guide: Abingdon: Radcliffe Publishing Ltd, 2007.
- Jones AM, Rice N, Bago d'Uva T, Balia S. Applied Health Economics, Routledge, 2007.
- Pauly MV, McGuire TJ, Barros PP. Handbook of health economics, volume 2, North Holland, 2011.
- Phelps CE. Health economics, Pearson, 5th edition, 2013.
- Sloan F, Hsieh CR. Health economics, MIT Press, 2012.

ORGANIZATION

The course is taught by specialists in health economics involved in research projects most often implying or concerning health sector stakeholders (self-employed physicians, hospitals, DREES and DGOS of the French Health Ministry, National compulsory health insurance, complementary health insurances, regional health observatories, regional health agencies, National cancer institute, National drug safety agency, Public health research institute, etc.). It will use both theoretical modelling and search for empirical evidence backed by statistical and econometric methods.

COURSE LANGUAGE

☐ French ☒ English

RECOMMENDED PREREQUISITES

Microeconomics 1-4, Macroeconomics 1-4, Econometrics 1&2, Methodology 2, Health and environmental economics.

Updated on April 2021

ENVIRONMENTAL ECONOMICS - 24H

TEACHERS
- Dominique AMI - dominique.ami@univ-amu.fr
- Hubert STAHN - hubert.stahn@univ-amu.fr

CONTENT

Part I of this lecture is dedicated to the design of an environmental policy. These regulation tools are first introduced in the context od a competitive polluting industry. We concentrate our attention on property rights, usual command and control, Pigouvian taxes, and emission rights permits. In a second step, we discuss the effect of imperfect competition, of imperfect information and of policy spill-overs.

In part two of this course you will learn about the categories of economic value assigned to environment and work through the utility theory on which environment valuation methods are based. We will survey the nonmarket valuation method employed by economists to measure public goods. This includes Revealed Preference methods and Stated Preference methods based on surveys and hypothetical markets. We will explore theoretical and empirical issues.

Course outline:

Part I: The design of an environmental policies
1. The regulation of a competitive polluting industry a. A competitive partial equilibrium model b. Property rights and the Coase theorem c. The different instruments
2. Some extensions a. Market Power b. Imperfect information c. Policy spill-overs

Part II: Valuing the Environment
1. The theory of environmental valuation a. Categories of Values b. From economic values of non-market goods to valuation methods c. Willingness To Pay (WTP) or Willingness To Accept (WTA)
2. Stated Preference Methods a. Hypothetical Market b. Contingent Valuation Methods c. Choice Modelling
3. Revealed preference Methods a. Valuing consumer's benefits b. Related topics

PROFESSIONAL SKILLS
- Identifying the main issues of modern resource and environmental economics.
- Identifying the relevant theoretical models to deal with them.
- Identifying the relevant empirical models to deal with them.
- Valuing goods and services when markets do not exist.

BIBLIOGRAPHY AND TEXTBOOKS
- Endres A. Environmental Economics: Theory and Policy Cambridge University Press 2010.
- Koldsadt C.D Environmental Economics Oxford University Press 2000.
- Hanley, N., E.B. Barbier Pricing Nature, Edward Elgar Publishing, Inc. 2009.
- Perman R., Ma Y., Common M., Maddison D., McGilvray J. Natural Resource and Environmental Economics 4th edition Addison Wesley 2011.
- Phaneuf D., T. Requate, A course in Environmental Economics, Theory, Policy and Practice Cambridge university Press 2017.

ORGANIZATION

This lecture on environmental economics is split into two topics of 12 hours. One is dedicated to environmental policy and the other to environmental evaluation.

COURSE LANGUAGE

☐ French ☒ English

FUNDAMENTAL PREREQUISITES
- Advanced Consumer's theory, producer theory, welfare economics.
- Market Failures: Externalities, Public Goods.
- Basic econometrics.

RECOMMENDED PREREQUISITES

Econometrics of Qualitative dependent variable: logit, logit multinomial models.

Updated on April 2021

HOUSING ECONOMICS - 24H

TEACHERS
- Alain TRANNOY - alain.trannoy@univ-amu.fr
- Baptiste MEUNIER - baptiste.meunier@ecb.europa.eu

CONTENT

Course outline:
Introduction (3h/R.Lecat)
- The triple dimension of Housing
- A joint product of land and structures. Land is fixed, structures are produced
- A highly differentiated consumption good. The highest expenditure share
- A capital good (Investment, Depreciation, renting vs owning)
- International comparisons

Chap 1: The construction of housing price index (3h/A. Trannoy)
- Models: Hedonic Model (Sherwin Rosen), Repeated Sales (Case and Shiller)
- Empirics: The construction of Notaires-Insee Price index
- How to use the hedonic model to test the success of an urban renewal policy

Chap 2: Can we regulate the dynamics of housing price through macroprudential policies (9h/R.Lecat)
- 2.1 Housing price, cycles and financial stability: the transmission of housing price cycles to the financial sector and the real economy (Kiyotaki-Moore; Campbell and Cocco)
- 2.2 Housing price bubble
- Housing as a market: the stock-flow model (Di Pasquale and W.Wheaton)
- Housing as an asset: financial valuation models
- Early warning tools
- Examples of Housing price bubbles
- 2.3 Macroprudential policy tools (Bennani et al.)
- Monetary policy and macroprudential policy
- Demand-oriented
- Supply-oriented
- Impact channels and estimates (Avouyi-Dovi et al.)

Chap 3: What are the impact of tax and transfer policies on housing market outcomes? (3h/A. Trannoy)
- Housing supply is fixed at short run. How elastic at long run?
- The role of land-use policy
- Housing benefits and Rents
- Rent control
- Capitalization of taxes in land values
- Inequality of housing conditions and housing cost of living (Albouy, Bérard-Trannoy)

Chap 4: Segregation in the City: The sorting of people (3h/A.Trannoy)
- Land location as an auction: The monocentric Alonso Model
- Extension Amenities Bruckner&Thisse&Zenou
- The influence of public transportation on location
- Can social housing mitigate segregation?

Chap 5: Do people (rent) follow jobs or do job (wage) follow people (rent)? (3h/A. Trannoy)
- The Rosen-Roback model
- Empirical evidence: Moretti, Albouy, Davis
- Can territorial policies be efficient to change the spatial equilibrium?

BIBLIOGRAPHY AND TEXTBOOKS

1. D.Di Pasquale and W.Wheaton 1996 'Urban Economics and Real Estate Markets'.
2. "Housing Market Dynamics and the Future of Housing Prices", D.Di Pasquale and W.Wheaton, Journal of Urban Economics, 1994, vol. 35, issue 1, pages 1-27.
3. « Credit cycle »; N.Kiyotaki and J.Moore, Journal of Political Economy (1997), 105(2), pp. 211-248.
4. « Insight from a Time-Varying VAR Model with Stochastic Volatility of the French Housing and Credit Markets, » S. Avouyi-Dovi & C. Labonne & R. Lecat & S. Ray, 2017. Working papers 620, Banque de France.
5. « The housing market: the impact of macroprudential measures in France, » Avouyi-Dovi, S. & Labonne, C. & Lecat, R., 2014. Financial Stability Review, Banque de France, issue 18, pages 195-206, April.6.
6. "Politique macroprudentielle", Bennani et al., Pearson, 2017.

7. Sherwin Rosen: Hedonic prices and implicit markets: product differentiation in pure competition, Journal of Political Economy 1974, 82: 34-55.
8. Erwin Diewert: Hedonic Regression: A consumer theory Approach.
9. F. Barthelemy, A. Michelangeli et A. Trannoy : "La Rénovation de la Goutte d'or est-elle un succès ? un diagnostic à l'Aide d'Indices de Prix immobiliers" Economie et Prévision 180-181 2007/4-5, 108-125.
10. K Case and Robert J. Shiller The Efficiency « of the Market for Single-Family Homes », American Economic Review, 79(1) (March 1989): 125-137.
11. Masahisa Fujita Urban Economic Theory: Land Use and City Size, Cambridge 1989.
12. Jan K. Brueckner, Jacques-François Thisse Yves Zenou Why is central Paris rich and downtown Detroit poor?: An amenity-based theory European Economic Review Volume 43, Issue 1, 10 January 1999, Pages 91-107.
13. Fack g. (2006), « are housing benefit an effective way to redistribute income? evidence from a natural experiment in France », Labour Economics, n° 13, p. 747-771.
14. Grislain Letremy et Trévien c. (2014), « The Impact of housing subsidies on the rental sector: The French example », Document de travail Insee-DESE, n° 2014-08. Version révisée en mars 2016.
15. Moretti, E. (2011). Local labor markets, in O. Ashenfelter and D. Card (eds), Handbook of Labor Economics, Vol. 4, Elsevier.
16. E Moretti (2013) The new geography of jobs Houghton Mifflin Harcourt.
17. Morris A. Davis François Ortalo-Magné (2011) Household expenditures, wages, rents The Review of Economic Dynamics Volume 14, Issue 2, April 2011, Pages 248-261.

COURSE LANGUAGE

☐ French   ☒ English

Updated on April 2021

END-OF-STUDY PROJECT

TEACHER

-

CONTENT

PROFESSIONAL SKILL(S)

BIBLIOGRAPHY AND TEXTBOOKS

ORGANIZATION

COURSE LANGUAGE

☐ French ☒ English

RECOMMENDED/FUNDAMENTAL PREREQUISITES

Update in progress

IT TOOLS FOR BIG DATA, A DEEPER VIEW - 24H

TEACHER
- EQUANCY (professional)

CONTENT

Course outline:
- Hadoop. HDFS. MapReduce. Stockage et calculs distribués. Déploiement d'un cluster.
- Préparation, stockage et traitement des big data : Pandas, Hive and Pig
- Data visualisation avec matplotlib & seaborn
- Alternatives : solutions propriétaires, bases NoSQL, ElasticSearch

PROFESSIONAL SKILL(S)

BIBLIOGRAPHY AND TEXTBOOKS

ORGANIZATION

COURSE LANGUAGE
☐   French   ☒   English

RECOMMENDED/FUNDAMENTAL PREREQUISITES

Update in progress

ADVANCED MACHINE LEARNING - 24H

TEACHER
- Badih GHATTAS - badih.ghattas@univ-amu.fr

CONTENT

Course outline:
- Advanced feature extraction (TF_IDF, Word2Vec, etc.)
- Deep learning (TensorFlow, Theano)
- Text Mining

PROFESSIONAL SKILL(S)

BIBLIOGRAPHY AND TEXTBOOKS

ORGANIZATION

COURSE LANGUAGE
☐ French ☒ English

RECOMMENDED/FUNDAMENTAL PREREQUISITES

Update in progress

CORPORATE STRATEGY - 24H

TEACHERS
- Airbus Helicopters (professional)
- The Janssen Pharmaceutical Companies of Johnson & Johnson (professional)

CONTENT
The objective is to introduce various tools used by private organizations to implement innovative strategies in order to adapt to their new environment, using skill, and knowledge students have learnt so far.

Course outline:
Part I: Case studies on a pharmaceutical firm
- Build a business case
- Make recommendations
- Adapt the case to a new situation

Part II: Development of new economic models
- Innovative marketing method
- Circular Economy

PROFESSIONAL SKILLS
At the end of the course, the student will be able to:
- Present case studies,
- Use Business intelligence,
- Suggest new economic models to private firms,
- Work in a team.

ORGANIZATION
The course is organized in 8 teaching slots, for a total of 4 days to develop case studies.
Two days are devoted to the analysis of the pharmaceutical case, and the two remaining case for the development of innovative approaches.
Cooperation and involvement of students will be highly required to create a dynamic course.
During these slots, students have to solve practical problems.

COURSE LANGUAGE
☐ French   ☒ English

FUNDAMENTAL PREREQUISITES
Industrial economics, econometrics.

RECOMMENDED PREREQUISITES
Environmental economics, health economics.

Updated on April 2021

COLLABORATING WITH PUBLIC ORGANIZATIONS - 27H

TEACHER
- IREEDD (professional)

CONTENT
The objective is to develop skills working on publics projects in a professional situation. There is a double aiming: (i) expose students to the management of
commons, and the implementation of a local public
project (e.g. in relation with urban issues); (ii) introduce students to the topic of the implementation of international projects (e.g. in relation with development or environmental issues).

Course outline:
Part I: Commons economics
- Introduction
- Examples and discussion
- Case studies
- Implementation of a project (on a voluntary basis)
Part II: Applied development economics
- Introduction
- Case studies

PROFESSIONAL SKILLS
At the end of the course, the student will be able to:
- Implement a public project,
- Work in a team,
- Field work (development economics).

ORGANIZATION
The course is organized in 8 teaching slots, 20h devoted to cost-benefit analysis, and 4h devoted to scenarios. During these slots, main concepts are presented, and students have to solve practical problems.

COURSE LANGUAGE
☐ French   ☒ English

FUNDAMENTAL PREREQUISITES
Public economics, environmental economics, development economics.

RECOMMENDED PREREQUISITES
Project management.

Updated on April 2021

MANAGING BIG DATA WITH SAS - 24H

TEACHER
- Freelance in data science (professional)

CONTENT

Course outline:
- SAS and Big Data, an introduction
- The SAS procedures for Big Data (1/2)
- The SAS procedures for Big Data (2/2)

PROFESSIONAL SKILL(S)

BIBLIOGRAPHY AND TEXTBOOKS

ORGANIZATION

COURSE LANGUAGE
☐   French   ☒   English

RECOMMENDED/FUNDAMENTAL PREREQUISITES

Update in progress

HANDS-ON PROJECT - 24H

TEACHER
- EQUANCY (professional)

CONTENT

PROFESSIONAL SKILL(S)

BIBLIOGRAPHY AND TEXTBOOKS

ORGANIZATION

COURSE LANGUAGE

☐   French   ☒   English

RECOMMENDED/FUNDAMENTAL PREREQUISITES

Update in progress