



# ÉCONOMIE

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**Website of the Department**

<https://www.polytechnique.edu/en/education/academic-and-research-departments/departement-economics>

## Program Description

The PA Economics is a one-year specialization program in Economics. The program emphasizes the quantitative aspects of economic analysis and relies mainly on modeling and game theory for the theory part, and on econometrics and data analytics for the empirical part. Although various courses are based on case studies, applications in real examples and data analysis, the main focus of the program will be on scientific studies aimed at engineers, and thus the provided courses will use strong scientific methodologies.

The program is aimed to the students who expect to develop their career in the public

sector (economic administration, ministries, regulation agency, central banks, international organization) or the private sector (consulting in business strategy, industry, bank, M&A, insurance, Financial services), or who wish to become entrepreneurs.

The PA Eco offers four specialization tracks: market strategy, corporate finance, public policy, and Master in Economics (Research track). All courses are taught in English.

## Fourth-year opportunities

### In France

- Corps de l'État.
- Écoles : ENSAE, Mines, Ponts (économie, gestion, finance), Télécom, HEC.
- Master 2 at Ecole Polytechnique : MScT Economics, Data Analytics and Corporate Finance, Economics for Smart Cities and Climate Policy, Data and Economics for Public Policy, REST, STEEM
- Masters en Economie de l'énergie et de l'environnement et de transports
- Second year (M2) of the Master in Economics (mainly for students from the "research track")

### Abroad

- PhD in Economics, Master in Finance, Public Administration, Operations Research
- Master in Business Analytics, Economics, Finance, Public Administration, Technology and Management, International Affairs, Operations Research.
- Academic research

## Research track

The "research track" of the PA Economics corresponds to the first year (M1) of the Master in Economics, which is a two-year program jointly offered by IP Paris and HEC. The objective of this program is to provide an advanced training in economics to students who want to become professional economists working in government, central banks, international organizations, consulting, and finance or in academic research.

The Master in Economics trains students to have a sound expertise in economics. The program heavily relies on advanced quantitative methods. The first year focuses on the theoretical and empirical tools of modern economic analysis, together with their most important applications. By the end of that year, students should be able to read research papers and assess the quality of economic arguments on non-trivial policy issues.

Students who choose to stay on for the second year (M2) will specialize within sub-fields of economics (finance, games and decision theory, industrial economics, macroeconomics, international economics, labor economics, public economics, sustainable development, and econometrics). By the end of that year, they should be familiar with the research frontier within their main area of specialization.

After finishing the M2, many strong students start a PhD in the U.S., at IP Paris, or elsewhere.

### SITE WEB DU MASTER IN ECONOMICS

<http://phd-in-economics.com/>

# COMPOSITION DU PROGRAMME

## Track Corporate Finance

### First period

#### 2 Mandatory courses

**EC0552A** - Applied Econometrics 1/**EC0552B** Advanced Econometrics 1

**EC0554** - Corporate Finance

#### One mandatory course among

**EC0553** - Financial Decisions under risk 1

**EC0570** - Blockchain 1: Bitcoin and Smart-Contracts (ENSAE)

**EC0579** - Case studies in Corporate Finance

**EC0579B** - Private Equity

**EC0652** - Valuation of start-ups

#### One course among

**EC0511** - Research Project in Applied or Theoretical Economics

**EC0553** - Financial Decisions under risk 1 (*if not chosen*)

**EC0556** - Industrial Organization

**EC0557** - Market Design

**EC0559** - Urban Economics and Real Estate

**EC0570** - Blockchain 1: Bitcoin and Smart-Contracts (ENSAE)

**EC0572** - Environmental economics and corporate environmental responsibility

**EC0579** - Case studies in Corporate Finance (*if not chosen*)

**EC0579B** - Private Equity (*if not chosen*)

**EC0652** - Valuation of start-ups (*if not chosen*)

**EC0684** - Public Economics & Public Finance (ENSAE) (Prerequisite EC0431)

**INF553** - Database and Management Systems, (prerequisite: INF411) (*strongly recommended*) or INF412

**MAP557** - Operations Research: Mathematical Aspects and Applications

### Second period

#### 2 Mandatory courses

**EC0562B** - Advanced Econometrics 2/**EC0562A** Applied Econometrics 2,  
*prerequisite: ECO552A/B*

**EC0568** - Advanced Corporate Finance, *Prerequisite: ECO554*

#### One mandatory course among

**EC0563** - Financial Markets

**EC0566** - Law and finance

**EC0582** - Financial Decisions under Risk 2, *prerequisite ECO553*

**EC0586/PHY560C** - Modelling of Financial Markets: An Introduction to Econophysics

**EC0587** - Behavioral Finance

#### One course among

**EC0511** - Research Project in Applied or Theoretical Economics

**EC0563** - Financial Markets (*if not chosen*)

**EC0564** - Economics of energy sectors

**EC0566** - Law and finance (*if not chosen*)

**EC0567A** - Energy Economics with geography focus

**EC0569** - Environmental Economics 2 (*prerequisite ECO572*)

**EC0580** - Competition Policy (*prerequisite ECO556*)

**EC0582** - Financial Decisions under Risk 2, prerequisite EC0553 (*if not chosen*)

**EC0585** - Economics facing nature: history and context

**EC0586/PHY560C** - Modelling of Financial Markets: An Introduction to Econophysics (*if not chosen*)

**EC0587** - Behavioral Finance (*if not chosen*)

**EC0588** - Digital Economics (*prerequisite ECO556*)

**EC0589** - Perspectives croisées sur les problématiques environnementales à travers l'étude de territoires

**EC0680B** - Big Data (for X)

# COMPOSITION DU PROGRAMME

## Market Strategy

### First period

#### Two Mandatory courses

**EC0552A** – Applied Econometrics 1/**EC0552B** Advanced Econometrics 1

**EC0556** – Industrial Organization

#### One mandatory course among

**EC0557** – Market Design

**EC0572** – Environmental Economics (*prerequisite EC0431*)

#### One course among

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0553** – Financial Decisions under risk 1

**EC0554** – Corporate Finance

**EC0557** – Market Design (*if not chosen*)

**EC0559** Urban Economics and Real Estate

**EC0570** – Blockchain 1: Bitcoin and Smart-Contracts

**EC0572** – Environmental Economics (*if not chosen*)

**EC0579** – Case studies in Corporate Finance

**EC0579B** – Private Equity

**EC0652** – Valuation of start-ups

**EC0655** – Dynamic pricing and revenue management (ENSAE)

**EC0684** – Public Economics & Public Finance (ENSAE), (*prerequisite EC0431*)

**INF553** – Database and Management Systems, (*prerequisite: INF411*)(*strongly recommended*)  
or INF412

**MAP557** – Operations Research: Mathematical Aspects and Applications

### Second period

#### Two Mandatory courses

**EC0562A** – Applied Econometrics 2/**EC0562B** – Advanced Econometrics 2, (*prerequisite: EC0552A/B*)

**EC0583** – Business Economics; (*prerequisite EC0556*)

#### One mandatory course among

**EC0580** – Competition Policy (*prerequisite EC0556*)

**EC0588** – Digital Economics (*prerequisite EC0556*)

**EC0680B** – Big Data

#### One course among

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0563** – Financial Markets

**EC0564** – Economics of energy sectors

**EC0566** – Law and Finance

**EC0567A** – Energy Economics with geography focus

**EC0568** – Advanced Corporate Finance, (*Prerequisite: EC0554*)

**EC0569** – Environmental Economics 2 (*prerequisite EC0572*)

**EC0580** – Competition Policy (*prerequisite EC0556*)(*if not chosen*)

**EC0581** – Economics of Biodiversity

**EC0582** – Financial Decisions under Risk 2, (*prerequisite: EC0553*)

**EC0585** – Economics facing nature: history and context

**EC0587** – Behavioral Finance

**EC0588** – Digital Economics (*prerequisite EC0556*)(*if not chosen*)

**EC0589** – Perspectives croisées sur les problématiques environnementales à travers l'étude de territoires

**EC0611A** – Lecture Series in Economics and Finance

**EC0660** – New technologies and Sharing Economy

**EC0680B** – Big Data (for X)(*if not chosen*)

# COMPOSITION DU PROGRAMME

## Public Policy

### First period

#### One Mandatory course

**EC0552A** – Applied Econometrics 1/**EC0552B** Advanced Econometrics 1

#### Two mandatory course among

**EC0550** – Microeconomics 1 (*compulsory if ECO431 not passed*)

**EC0556** – Industrial Organization

**EC0557** – Market Design

**EC0559** – Urban Economics and Real Estate

**EC0572** – Environmental Economics

**EC0684** – Public Economics and Public Finance (ENSAE), (*prerequisite: ECO431*)

#### One course among

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0550** – Microeconomics 1 (*if not chosen*)

**EC0553** – Financial Decisions under Risk 1

**EC0554** – Corporate Finance

**EC0556** – Industrial Organization (*if not chosen*)

**EC0557** – Market Design (*if not chosen*)

**EC0559** – Urban Economics and Real Estate (*if not chosen*)

**EC0570** – Blockchain 1: Bitcoin and Smart-Contracts

**EC0572** – Environmental Economics (*if not chosen*)

**EC0579** – Case studies in Corporate Finance

**EC0579B** – Private Equity

**EC0684** – Public Economics and Public Finance (ENSAE) (*if not chosen*)

**INF553** – Database and Management Systems, (*prerequisite: INF411*) (*strongly recommended*)  
or INF412

**MAP557** – Operations Research: Mathematical Aspects and Applications

### Second period

#### One Mandatory course

**EC0562A** – Advanced Econometrics 2/**EC0562B** – Applied Econometrics 2, (*prerequisite: EC0552*)

#### One mandatory course among

**EC0580** – Competition Policy

**EC0561** – Macroeconomics 2

#### Two courses among

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0561** – Macroeconomics 2 (*if not chosen*)

**EC0563** – Financial Markets

**EC0564** – Economics of energy sectors

**EC0566** – Law and Finance

**EC0567A** – Energy Economics with geography focus

**EC0568** – Advanced Corporate Finance, (*prerequisite: EC0554*)

**EC0569** – Environmental Economics 2 (*prerequisite: EC0572*)

**EC0580** – Competition Policy (*prerequisite EC0556*)

**EC0581** – Economics of Biodiversity

**EC0582** – Financial Decisions under Risk 2, (*prerequisite: EC0553*)

**EC0585** – Economics facing nature: history and context

**EC0587** – Behavioral Finance

**EC0588** – Digital Economics (*prerequisite: EC0556*)

**EC0589** – Perspectives croisées sur les problématiques environnementales à travers l'étude de territoires

**EC0611A** – Lecture Series in Economics and Finance

**EC0680B** – Big Data

# COMPOSITION DU PROGRAMME

## Master in Economics

*All is mandatory*

### First period

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0550** – Microeconomics 1

**EC0551** – Macroeconomics 1

**EC0552B** – Advanced Econometrics 1

**EC0558** – Time Series Econometrics

### Second period

**EC0511** – Research Project in Applied or Theoretical Economics

**EC0560** – Microeconomics 2

**EC0561** – Macroeconomics 2

**EC0562B** – Advanced Econometrics 2

## All Tracks

### Semester 1 and 2

#### *Elective Applied projects*

**EC0511** – Research Project in Applied or Theoretical Economics through 1st and 2nd semester, can replace two courses

In order to complement theoretical knowledge acquired during the courses, Project EC0511 provides students with opportunities to work on a topic in applied economics, with some empirical ingredients or applied economic theory. Students work in groups of two or three members, and they are graded during an oral exam in March. A written report is submitted a week before the oral exam. Academic tutors provide topics, and meet the students on regular basis to supervise their work. The list of topics is provided at the end of September. The allocation of the groups will be on the first-come-first-serve basis. Any topics proposed by the students/ any arrangements are to be discussed individually.

#### *Approximate timeline*

- September: announcement of the subject list by the department
- Beginning of October: registration, beginning of work
- Beginning of December: mid-term report (Semester 1)
- Beginning of March: final report (Semester 2)
- Mid- March, oral exam

### Semester 3

#### *Stage de recherche (Research Internship)*

**EC0591** – Internship in Microeconomics/Corporate/Environmental Sector

**EC0592** – Internship in International Economics/Public Policy

**EC0593** – Internship in Banking/Finance

In the third semester, students do an internship of 16 weeks' minimum. The objective of this research internship is to provide students with opportunities to apply economic theory in practice. The students are expected to deliver application of economic theory into practice in a public or private institution, or conduct economic research in an academic institution.