– MASTER –

OF SCIENCE & TECHNOLOGY

l'X

ÉCOLE POLYTECHNIQUE

IP PARIS

RANKINGS

- #2 Best University in France
  QS 2019
- #2 Best small University in the world
  Times Higher Education 2018
- #28 World Most International University
  Times Higher Education 2018
- #30 Worldwide in term of graduate employability
  QS ranking 2019

ÉCOLE POLYTECHNIQUE

AT A GLANCE

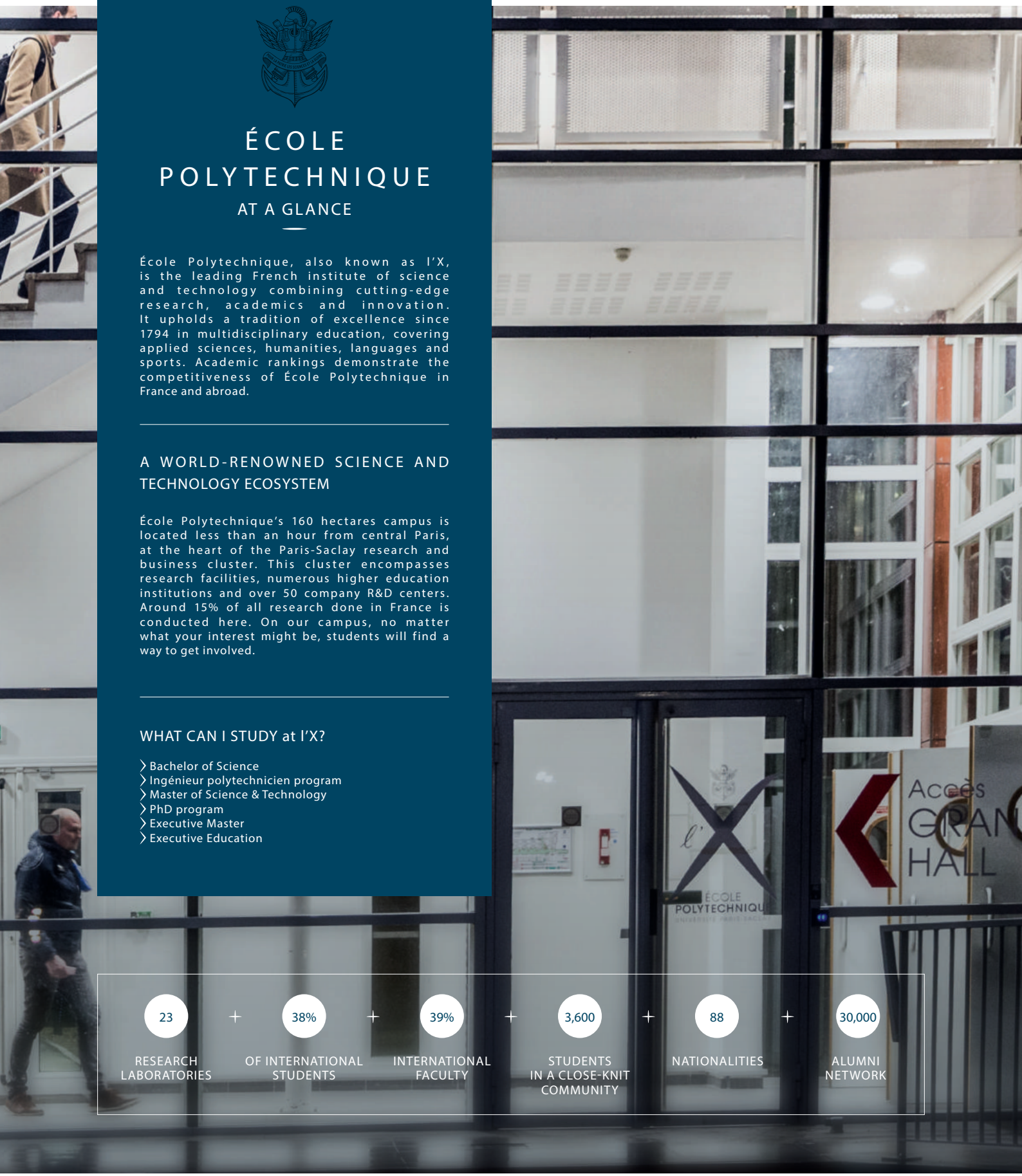
École Polytechnique, also known as l'X, is the leading French institute of science and technology combining cutting-edge research, academics and innovation. It upholds a tradition of excellence since 1794 in multidisciplinary education, covering applied sciences, humanities, languages and sports. Academic rankings demonstrate the competitiveness of École Polytechnique in France and abroad.

A WORLD-RENOWNED SCIENCE AND TECHNOLOGY ECOSYSTEM

École Polytechnique's 160 hectares campus is located less than an hour from central Paris, at the heart of the Paris-Saclay research and business cluster. This cluster encompasses research facilities, numerous higher education institutions and over 50 company R&D centers. Around 15% of all research done in France is conducted here. On our campus, no matter what your interest might be, students will find a way to get involved.

WHAT CAN I STUDY at l'X?

- Bachelor of Science
- Ingénieur polytechnicien program
- Master of Science & Technology
- PhD program
- Executive Master
- Executive Education



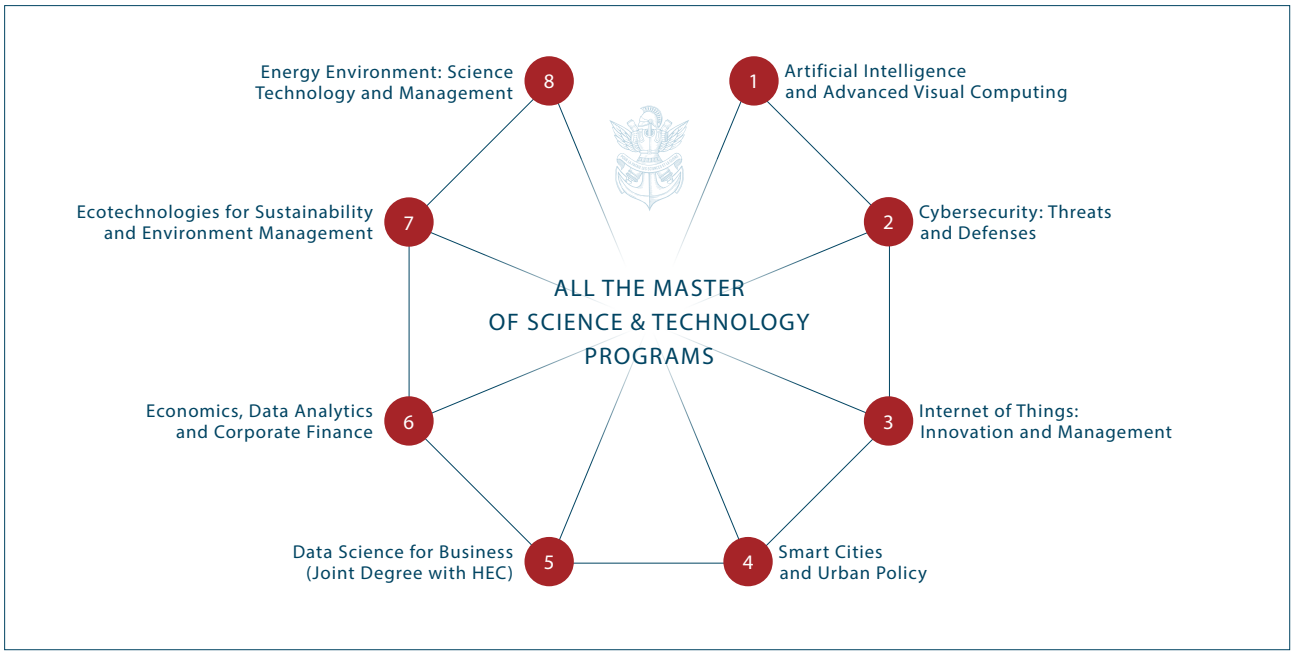
23	38%	39%	3,600	88	30,000
RESEARCH LABORATORIES	OF INTERNATIONAL STUDENTS	INTERNATIONAL FACULTY	STUDENTS IN A CLOSE-KNIT COMMUNITY	NATIONALITIES	ALUMNI NETWORK

MASTER
OF SCIENCE & TECHNOLOGY

Master's Degree | Industry-Oriented
Two years | In English | In France
September 2020 | 140 ECTS

École Polytechnique's Master of Science and Technology Programs are two-year courses that provide students with state-of-the-art multidisciplinary education. The courses offer in-depth scientific knowledge relevant to every student's career interest, whether it is new technologies, economics, data science or sustainable development.

Our programs are tailored for students who want to play a key role in leading technology and business organizations throughout the world. As such, we are looking for highly qualified undergraduate students with a solid background in science and/or engineering.



WHAT MAKES THE MASTER OF SCIENCE & TECHNOLOGY UNIQUE?

HIGH LEVEL TEACHING

Our students acquire well-balanced theoretical and practical knowledge. This is thanks to outstanding courses taught by École Polytechnique's world-class professors, associated research centers, national and international academic partners, and top industry professionals.

RESEARCH

Each Master of Science and Technology program will help you understand the frontiers of technology and teach you how to build bridges between research and the corporate world. You will learn to combine fundamental research, technological applications and developments, and innovation management.

While the MSc&T are mainly geared towards students who plan to enter industry immediately following graduation, they also meet the European prerequisites for admission onto a PhD program.

INNOVATION MANAGEMENT

École Polytechnique has developed an academic department entirely dedicated to Innovation Management and Entrepreneurship. In 2015, l'X also established a center for innovation known as LA FIBRE ENTREPRENEUR Drahi X-Novation Center, which houses the institution's start-up Incubator and Accelerator, a prototyping area, co-working spaces, and much more.

These outstanding facilities allow us to offer a multidisciplinary curriculum that integrates science and engineering with leadership, innovation, entrepreneurship and core management concepts.

CLOSE INDUSTRY COLLABORATION

Now more than ever, employers value graduates who can bring real-world experience and perspectives to their organizations. Our industry-oriented Master's degrees also equip our students with the practical skills and initial work experience necessary to hit the ground running in industry.

Each program includes field trips and conferences. Students also have the chance to get involved in individual and team projects in collaboration with our many industrial partners, both years include four to six-month work placements at companies in France or abroad. On top of this, l'X hosts an annual job fair, the most prestigious one held by a French engineering school, to which more than 200 companies participate.

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MASTER

ARTIFICIAL INTELLIGENCE AND ADVANCED VISUAL COMPUTING

Be part of a field that leads to strong societal impact applications

WHAT IS THE PROGRAM ABOUT?

The Artificial Intelligence and advanced Visual Computing Master of Science and Technology provides students with an in-depth understanding of the most recent techniques in artificial intelligence, and teaches them to implement cutting-edge methods efficiently.

This program equips students with the keys to become the next creators of innovative applications, using deep learning and visual computing.

This program tackles a lot of subjects. We meet researchers that really know their topic. In your career, you want to make sure you choose the field that interests you the most. Here you can learn about a lot of different aspects of AI. That's one of the strengths of the program.

Nicolas Nghiem
Alumni student

STRUCTURE OF THE PROGRAM

Into three periods: two of them combine lectures, practical sessions and seminars and the other consists in an internship. The curriculum is based on two fields, namely Artificial Intelligence and Visual Computing. The first field is studied through statistical learning theory, machine learning, while the second is tackled through 3D computer graphics, virtual and augmented reality, computer vision, robotics, and 3D manufacturing. Taken together, these two fields lead to a wide range of applications.

EXPERIENCE-BASED LEARNING*

Second-year students spend half a day per week working on a Transverse Project, which gives them a taste of the industry. This project helps them find solutions to a significant issue raised by either an industrial partner or a researcher in a domain covered by the program.

The Master ends with a six-months internship, during which students work on a project, either at a company R&D center or a research lab. The Master's Program has developed strong collaborations with world-class partners in industry or academy, many of them offering challenging interships to our students.

AFTER THE MASTER?

The program combines both research and professional experience. After graduating, students can either pursue PhD study at a French or foreign research lab, or work for companies and start-ups across a range of industries: digital apps, drones, virtual reality, e-commerce.

PROGRAM STRUCTURE

Program directors: Marie-Paule Cani & Erwan Scornet

✓ Mandatory courses › Optional courses

YEAR 1

4 MANDATORY COURSES

- ✓ Machine Learning 1
- ✓ Machine Learning 2
- ✓ Constraint-based Modeling and Algorithms for Decision-Making
- ✓ Computer Animation

2 ELECTIVE COURSES PER PERIOD AMONG

- › Image Analysis (P1)
- › Digital Representation and Analysis of Shapes (P1)
- › Signal and Sound Processing (P1)
- › Algorithmic Geometry: From Theory to Applications (P2)
- › Image Synthesis: Theory and Practice (P2)
- › Statistics in Action (P2)
- › Advanced Topics in Artificial Intelligence (P2)

MANAGEMENT AND INNOVATION

- ✓ Marketing and Strategy Introduction
- ✓ Technology-based entrepreneurship and new business creation

INTERNSHIP

- ✓ 4 to 6-month research or industrial internship

YEAR 2 ✓

LONG COURSES

- ✓ Deep Learning
- ✓ Reinforcement Learning

SHORT COURSES

- ✓ Data Analysis: Geometry and Topology in Arbitrary
- ✓ Natural Language and speech Processing: from knowledge modeling to machine learning
- ✓ Advanced 3D Graphics
- ✓ Computer Vision
- ✓ Robot Motion Planning, Verification and Control of Hybrid Systems
- ✓ Socio-Emotional Embodied Conversational Agents
- ✓ Soft robots: simulation, fabrication, and control
- ✓ Virtual/Augmented Reality & 3D Interactions

SEMINAR

- ✓ Ethical issues and novel applications of AI

TRANSVERSE PROJECT

- ✓ Experience-based learning

INTERNSHIP

- ✓ 5 to 6 months project, either in the R&D department of a company or in a research lab

TRANSVERSE COURSES

Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

Bachelor's degree (or licence) in Mathematics or Computer Science. Applicants must have followed at least one course about Statistics and at least one about Algorithmics. Applicants with other degrees may also be considered, provided that they have a solid skill set in the above-mentioned subjects.

HOW MUCH WILL IT COST?

€ 15,000 per year

€ 80 application fee

Scholarships and financial aid are available from our partners

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MASTER
CYBERSECURITY: THREATS AND DEFENSES

Tackle online piracy
at the highest level

WHAT IS THE PROGRAM ABOUT?

The Cybersecurity: Threats and Defenses Master of Science and Technology is a two-year program, entirely taught in English and designed for highly qualified and internationally oriented students. The Program offers high-level scientific classes taught by faculty from École Polytechnique and partner companies.

Conferences are given by renowned academic and industrial lecturers at l'X every week, in the fields of sciences and management. This contributes to giving École Polytechnique a strong image in the industry and makes it easy for us to apply for our dream jobs.

Dhruv Malik
second year student

STRUCTURE OF THE PROGRAM

This two-year Master's degree, fully taught in English, is designed to equip you with the skills required for the business world. The first year of the Program is devoted to acquiring tools and techniques, while the second year focuses on real-world applications. Throughout the two years, students also get the opportunity to connect with industries, thanks to two internships and on-the-ground experience with researchers from l'X and visiting lecturers.

EXPERIENCE-BASED LEARNING

Each year ends with a 4 to 6-month internship in either research or industry, always with a strong scientific or technological component. Students have access to a large number of internships options with the program's numerous academic and industrial partners.

AFTER THE MASTER?

After graduating, our students have access to a wide range of high-level jobs, from security auditors to system developers and security architects, to name a few.

PROGRAM STRUCTURE

Program director: François Morain

✓ Mandatory courses › Optional courses

YEAR 1

8 MANDATORY COURSES

- ✓ From the Internet to the IoT: The Fundamentals of Modern Computer Networking
- ✓ Introduction to Cryptology
- ✓ A Programmer's Introduction to Computer Architectures and Operating Systems
- ✓ Distributed Computing
- ✓ Advanced Cryptology
- ✓ Information Systems Security
- ✓ Network Security

4 OPTIONAL COURSES

- ✓ Database Management Systems (period 1)
- ✓ Machine learning 1 (P1)
- ✓ Introduction to Information Theory (P2)
- ✓ Machine Learning 2 (P2)

MANAGEMENT AND INNOVATION

- ✓ Introduction to Marketing and Strategy
- ✓ Technology-based entrepreneurship and new business Creation

INTERNSHIP

- ✓ 4-month research or industrial internship

YEAR 2

6 MANDATORY COURSES

- ✓ Blockchain
- ✓ Applied crypto: biometry; obfuscation (white box); steganography, watermarking
- ✓ Filtering architectures
- ✓ Introduction to formal methods
- ✓ C-secure programming/ System security
- ✓ Embedded security: side-channel attacks; javacard

MANAGEMENT AND INNOVATION

- ✓ Business Models in the Digital Era
- ✓ Case studies on Innovation

INTERNSHIP

- ✓ 5 to 6-month research or industrial internship

TRANSVERSE COURSES

Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

Bachelor's Degree in Computer Science. Applicants with other degrees may be considered, provided that they have a strong background in computer science.

HOW MUCH WILL IT COST?

€ 15,000 per year

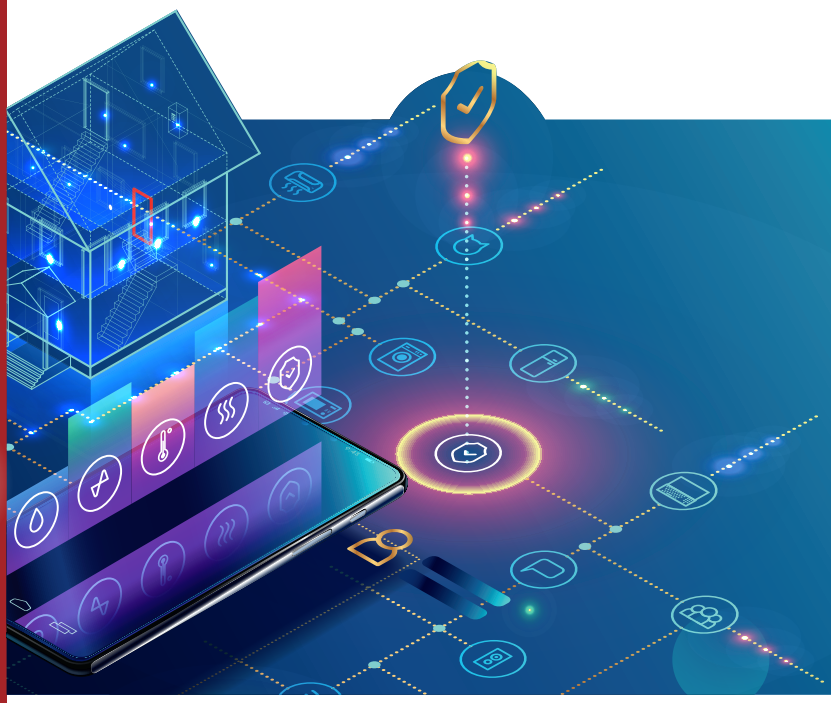
€ 80 application fee

Scholarships and financial aid are available for the best applicants

MASTER

INTERNET OF THINGS: INNOVATION AND MANAGEMENT

3



Learn to drive the future of digital transformation

WHAT IS THE PROGRAM ABOUT?

The Internet of Things: Innovation and Management Master of Science and Technology is geared towards training future leaders of the digital revolution. Our students learn to design new objects, improve our use of existing ones, create business models, advance our understanding through research, and much more.

It is possible to learn something new every day at École Polytechnique, not only because of the top-level education but also because of the skilled professors that help us improve and become better each day.

Gökçe Alkan
second year student

STRUCTURE OF THE PROGRAM

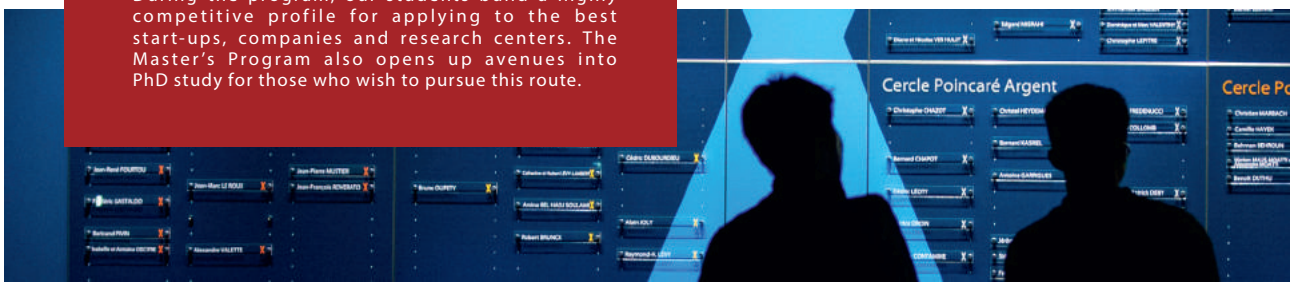
Each year of the program is divided into three periods: two of classes and one dedicated to the Graduate Project. During the first year, all students take the same classes wherein they learn the theoreticaland conceptual basics required to continue on the program.
In year 2, students are ready to specialize. They can choose a large number of their classes and pursue hard sciences, economics, electronics, security, or any other domain related to the world of connected objects, provided that their decision is in line with their Graduate Project.

EXPERIENCE-BASED LEARNING

Students spend several hours a week on their Graduate Project. Throughout the two years, they have to manage each step of the development of a connected object, from initial conception right through to design, prototyping and pitching. The trimester of each year is devoted entirely to completion of students' Graduate Projects.

AFTER THE MASTER?

During the program, our students build a highly competitive profile for applying to the best start-ups, companies and research centers. The Master's Program also opens up avenues into PhD study for those who wish to pursue this route.



PROGRAM STRUCTURE

Program director: Thomas Clausen

✓ Mandatory courses › Optional courses

YEAR 1

PERIOD 1
Sept-Dec

Refreshers:

- ✓ IoT Refresher

Core Courses:

- ✓ Practical C and Java Programming, Algorithms, and Data Structure
- ✓ IoT Workshops
- ✓ From the Internet to the IoT – The Fundamentals of Modern Computer Networking
- ✓ Business Models in the Digital Era
- ✓ Fundamentals of Strategy & Innovation
- ✓ Digital and Analog Electronics
- ✓ Culture & Technology

PERIOD 2
Jan-March

- ✓ IoT Workshops
- ✓ Independent IoT Project
- ✓ From Fundamentals to Reality – How the Internet Really Works, and How to Make It Better
- ✓ Corporate Finance for Entrepreneurs
- ✓ Humanities & French Culture

PERIOD 1 & 2

- ✓ IoT Seminars
- ✓ Sports
- ✓ Languages

PERIOD 3
March-Aug

- ✓ 4-month research or industrial internship

YEAR 2

PERIOD 1
Sept-Dec

- ✓ Independent IoT Project
- ✓ Cyber-Physical Systems
- ✓ A Programmer's Introduction to Computer Architectures and Operating
- ✓ Database Management Systems
- ✓ Marketing and Strategy Introduction

PERIOD 2
Jan-March

- ✓ IoT Project & Workshops
- ✓ Digital Economics
- ✓ Technology-Based Entrepreneurship and New Business Creation
- ✓ Network Security
- ✓ Sensors and Transtucers: From Macro to Nano
- ✓ Machine learning II

PERIOD 1 & 2

- ✓ IoT Seminars
- ✓ One Foreign language module
- ✓ Modules of Humanities and French Courses
- ✓ Sport

PERIOD 3
March-Aug

- ✓ 4 to 5-month research or industrial internship

ACADEMIC PREREQUISITES

Bachelor's degree (or licence) in science, technology, engineering, mathematics. Applicants from other educational backgrounds may also be considered provided that they have a solid skill set in the subjects mentioned above.

HOW MUCH WILL IT COST?

€ 12,000 per year

€ 80 application fee

Scholarships and financial aid are available for the best applicants

MASTER
SMART CITIES AND URBAN POLICY

4

Get the keys to unleash cities economic potential

WHAT IS THE PROGRAM ABOUT?

The Smart Cities and Urban Policy Master's Degree is designed for highly qualified and internationally-oriented students.

This program equips students with the know-how to navigate the current trends shaping 21st-century metropolitan economies. It involves applying advanced quantitative methods to the study of new and transforming metropolitan areas and their competitive environments.

The framework of the Master in Smart Cities gives me the opportunity to see the wide range of how cities developed by managing their assets and energy from an economic perspective

Harold Canchari Daga
second year student

STRUCTURE OF THE PROGRAM

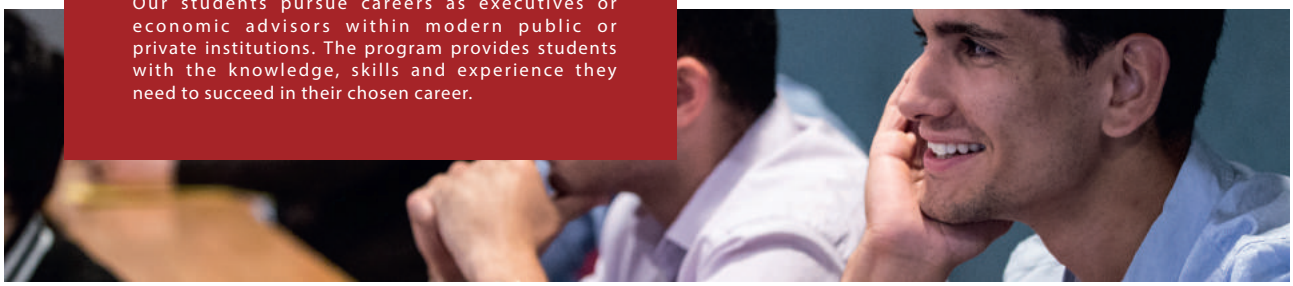
Each year of the program is divided into three trimesters: two trimesters of classes and one trimester dedicated to the internships. Throughout the program, students develop strong economics skills with classes like Urban Economics and Real Estate, Economics of Energy Sectors, Corporate Finance, or Industrial Organization. Students complete a four- to six-month internship at the end of each year of the program, either in France or abroad.

EXPERIENCE-BASED LEARNING

The Capstone Project is done over the course of both years, and involves evaluating the climate action plan of Paris in collaboration with the City of Paris. Students select one of the areas of the Paris climate and energy action plan (mobility, housing, air quality, sustainable consumption, waste policy, adaptation strategy) and conduct a scientific study to evaluate it in relation to their chosen area.

AFTER THE MASTER?

Our students pursue careers as executives or economic advisors within modern public or private institutions. The program provides students with the knowledge, skills and experience they need to succeed in their chosen career.



PROGRAM STRUCTURE

Program director: Patricia Crifo

✓ Mandatory courses › Optional courses

YEAR 1

PERIOD 1
Sept-Dec

3 MANDATORY COURSES

- ✓ Urban Economics and Real Estate
- ✓ Environmental Economics and Policies in Cities
- ✓ Econometrics 1

1 ELECTIVE COURSE AMONG

- › Corporate Finance
- › Industrial Organization

PERIOD 2
Jan-March

3 MANDATORY COURSES

- ✓ Traffic and Transportation systems in urban contexts
- ✓ Applied Econometrics
- ✓ Digital Economics

1 ELECTIVE COURSE AMONG

- › Management of energy system
- › Economics of Energy Sectors
- › New technologies and the sharing economy

1 ELECTIVE MANAGEMENT & INNOVATION COURSE

- › Case Studies of Innovation
- › Technology-based entrepreneurship and new business creation
- › Sustainable Strategy and Business model

PERIOD 1 & 2

- ✓ Lecture series in Finance and Economics
- ✓ Capstone Project: Paris climate action plan evaluation
- ✓ GIS & Python 1
- ✓ Languages Humanities and French Culture Sports

PERIOD 2
April-Aug

- ✓ 4-month research or industrial internship

YEAR 2

Students have access to two courses offered by our partner Telecom ParisTech from Master IREN (www.masteriren.eu)

PERIOD 1
Sept-Dec

2 MANDATORY COURSES

- ✓ Urban services and utilities
- ✓ Cities and Transportation

1 ELECTIVE COURSE AMONG

- › Corporate Finance
- › Industrial Organization
- › Market design
- › Network economics

PERIOD 2
Jan-March

3 MANDATORY COURSES

- ✓ GIS and public policies
- ✓ Big Data
- ✓ Economics of energy sectors

1 ELECTIVE COURSE AMONG

- › Environment and Local Development Economics
- › New technologies and the sharing economy
- › Management of energy systems
- › Energy transition and electromobility

PERIOD 1 & 2

- ✓ Lecture series in Finance and Economics
- ✓ Capstone Project: Paris climate action plan evaluation
- ✓ Python 2
- ✓ Startup Deep Tech
- ✓ Languages Humanities and French Culture Sports

PERIOD 3
April-Sept

- ✓ 6-month internship in France or abroad

TRANSVERSE COURSES

Lecture series in Finance and Economics + Capstone project : Paris climate action plan evaluation + Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

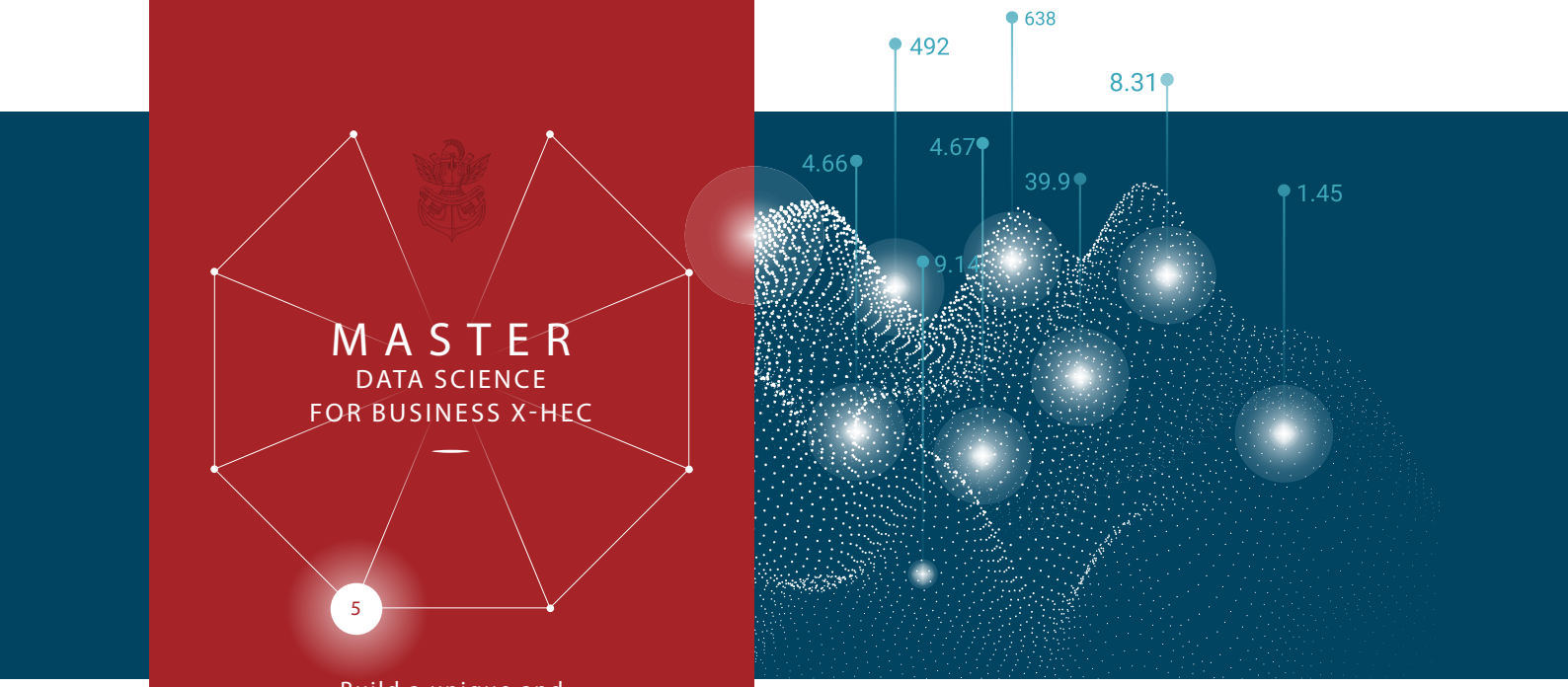
Bachelor's degree (or licence) in economics, mathematics, civil engineering and/or transportation studies, or a French engineering degree. Applicants from other educational backgrounds may also be considered provided that they have a solid skill set in the subjects mentioned above.

HOW MUCH WILL IT COST?

€ 12,000 per year

€ 80 application fee

Scholarships and financial aid are available for the best applicants



MASTER
DATA SCIENCE FOR BUSINESS X-HEC

5

Build a unique and dual-skilled profile

WHAT IS THE PROGRAM ABOUT?

The X-HEC Data Science for Business Master of Science and Technology is a two-year program taught jointly by École Polytechnique and HEC Paris. It aims to train dual-profile managers and data scientists to become tomorrow's entrepreneurs, intrapreneurs and data managers, who will go on to create impactful startups, disrupt business models and manage innovation.

There's no need to emphasize the growing importance of data for companies and for society. The X-HEC program brings the best network in France and empowers those students that want to create a business. It's probably the most promising MSc track of both institutions.

Nicolas Bonnot
second year student

STRUCTURE OF THE PROGRAM

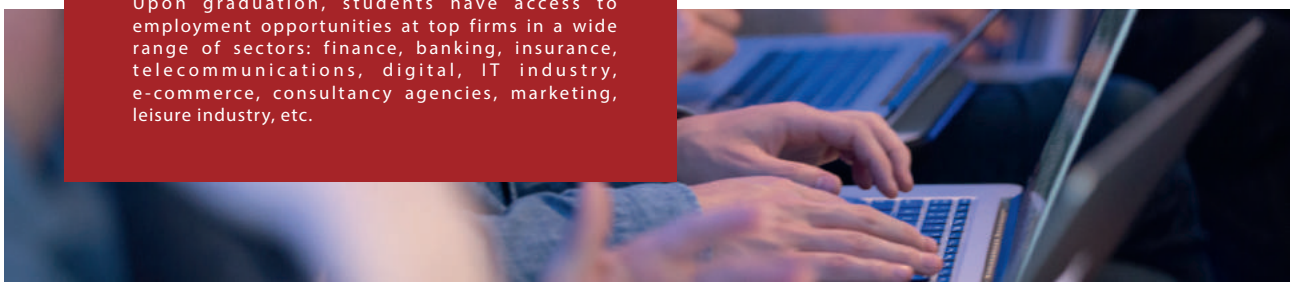
The first year of the program takes place at École Polytechnique, with a strong focus on scientific and mathematic topics. The second year is spent at HEC Paris, and uses learning-by-doing methods to help students enhance their management knowledge and apply it to solve complex business challenges. During these two years, students benefit from world-class faculty and study alongside leading data scientists in specialized research units within a competitive environment.

INTERNSHIPS

The first year ends with a 4-month internship with a company in a data-related sector. The second year is completed with a research paper. Students work on a specific subject during 4 months with the help of a tutor.

AFTER THE MASTER?

Upon graduation, students have access to employment opportunities at top firms in a wide range of sectors: finance, banking, insurance, telecommunications, digital, IT industry, e-commerce, consultancy agencies, marketing, leisure industry, etc.



PROGRAM STRUCTURE

Program directors: Julie Josse & Vincent Fraitot

✓ Mandatory courses › Optional courses

YEAR 1

REFRESHER COURSES

For students with a business/ management background

- ✓ Probability refresher
- ✓ Mathematical foundations of data science

8 MANDATORY COURSES

- ✓ Statistics
- ✓ Introduction to Machine Learning
- ✓ Regression
- ✓ Python for Data Science
- ✓ Machine Learning 2
- ✓ Optimization / Deep Learning
- ✓ Database Management
- ✓ Data Science for Business Seminars

1 ELECTIVE COURSE AMONG

- › Capgemini Data Camp Projects
- › Statistical Models for Health
- › Causal Inference / Reinforcement Learning

INTERNSHIP

- ✓ 4-month Internship in a company (27 ECTS)

YEAR 2 ✓

7 CORE COURSES

- ✓ Introductory Supercase
- ✓ Digital Transformation Strategy
- ✓ Making sense of the technology ecosystem
- ✓ Regulations and Compliance in Data Science
- ✓ Data Analytics for Business Strategy
- ✓ Deep Learning
- ✓ Time Series and Financial Data, etc.

2 BUSINESS CHALLENGES

- ✓ Data I and II
- ✓ Entrepreneurship

3 TRACKS

- › Data Manager: Joining a data science department of a company
- › Data Entrepreneur: Joining the HEC Startup Launchpad and creating a startup
- › Data Consultant: Joining a consulting firm to help clients develop business by leveraging data

Learning Expeditions: New York & London

Research Paper

ACADEMIC PREREQUISITES

Bachelor's degree in Science, Engineering, Business or Economics. A strong background in Mathematics is mandatory as students deal with data pool and learn mathematical techniques for extraction and data visualization.

HOW MUCH WILL IT COST?

19,850 per year

€ 110 application fee

Scholarships and financial aid are available for the best applicants

MASTER
ECONOMICS, DATA ANALYTICS AND CORPORATE FINANCE

6

Gain the essential skills
for strategic decision-making
in the corporate world

WHAT IS THE PROGRAM ABOUT?

The Economics, Data Analytics and Corporate Finance Master of Science and Technology provides students with essential skills for strategic decision-making in the corporate world. The program combines three complementary disciplines that are usually taught separately at this level of study: microeconomic analysis, corporate finance and data analytics.

This program gives us this ability to have a diverse set of skills that is useful for a lot of different companies at a strategic level and implementation of new projects or independent things.

Lucas
recent graduate

STRUCTURE OF THE PROGRAM

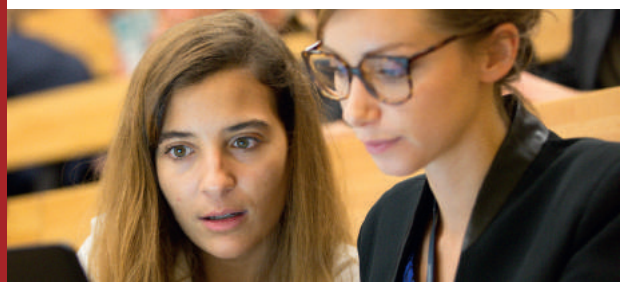
Each year is divided into three trimesters, with the first two devoted to classes (9 weeks each), presentations and projects. The last trimester takes the form of an end-of-year internship. The first year involves principally theory-based teaching, focusing on fundamentals and methodologies of the disciplines studied, year two offers more applied, project-oriented courses. In Year 2, students choose one of the two specializations: Finance or Economics.

EXPERIENCE-BASED LEARNING

At the end of each year, our students complete internships in France or abroad. They may decide to develop their practical skills in corporate finance by joining banks or private equity firms, go into strategic consulting, or develop data analytics in any sector.

AFTER THE MASTER?

The Economics, Data Analytics and Corporate Finance Master opens the door to a wide range of professional opportunities in corporate finance (M&A, investment funds, business ventures), consulting, strategy management, and data analytics. Graduates of the Program can easily join any type of company, from start-ups to multinational corporations, in fields such as digital transformation, data science and strategy.



PROGRAM STRUCTURE

Program director: Marie-Laure Allain

✓ Mandatory courses › Optional courses

YEAR 1

3 CORE COURSES PER PERIOD

- ✓ Industrial Organization
- ✓ Econometrics 1
- ✓ Corporate Finance
- ✓ Econometrics 2
- ✓ Business Economics
- ✓ Advanced Corporate Finance

1 ELECTIVE PER PERIOD

PERIOD 1

- › Financial Decisions under Risk 1
- › Market Design
- › Urban Eco. & Real Estate
- › Environmental economics & policy in cities
- › Case Studies in Finance
- › Merger & Acquisition

PERIOD 2

- › Competition Policy
- › Financial Decisions under Risk 2
- › Behavioral Finance
- › Digital Economics
- › Bitcoin and Fintech
- › Supply Chains
- › Blockchain and Platform Design

LECTURE SERIES IN FINANCE AND ECONOMICS

MANAGEMENT AND INNOVATION

- ✓ Entrepreneurship Certificate and Marketing & Strategy Introduction

INTERNSHIP

- ✓ 4-month research or industrial internship

YEAR 2

4 CORE COURSES PER PERIOD

FINANCE TRACK

- ✓ Econometrics of Competition
- ✓ Valuation of Startups
- ✓ Financial Markets
- ✓ Big Data

ECONOMICS TRACK

- ✓ Firms & Markets
- ✓ Econometrics of Competition
- ✓ New Technologies and the sharing Economy
- ✓ Big Data

2 ELECTIVES PER PERIOD

FINANCE TRACK

PERIOD 1

- › Financial Decisions under Risk 1
- › Case Studies in Corporate Finance
- › Merger & Acquisition
- › Firms & Markets

PERIOD 2

- › Financial Decisions under Risk 2
- › Behavioral Finance
- › Bitcoin and Fintech
- › Blockchain and Platform Design
- › New Technologies and the Sharing Economy

ECONOMICS TRACK

PERIOD 1

- › Market Design
- › Urban Eco. & Real Estate
- › Environmental Economics
- › Valuation of Startups

PERIOD 2

- › Competition Policy
- › Digital Economics
- › Supply Chains
- › Bayesian Methods for Marketing
- › Quantitative Marketing
- › Financial Markets

Students may pick one elective from the other track

INTERNSHIP

- ✓ 5-month research or industrial internship

TRANSVERSE COURSES

Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

The program is primarily intended for students with comprehensive Mathematical and Economics training. However, it is open to students with a finance, or engineering background. Above all, a good command of mathematics is crucial to follow the highly quantitative-based approach of this Master's program.

HOW MUCH WILL IT COST?

12,000 per year

€ 80 application fee

Scholarships and financial aid are available for the best applicants

7

MASTER

ECOTECHNOLOGIES FOR SUSTAINABILITY AND ENVIRONMENT MANAGEMENT

Make a significant impact on environmental issues

WHAT IS THE PROGRAM ABOUT?

The Ecotechnologies for Sustainability and Environment Management (ECOSEM) Master's is a two-year program providing students with real-world technical expertise on environmental issues, including soil and water pollution diagnosis, and treatment and valorization processes, as well as in-depth understanding of the economic and social challenges surrounding their development. The course's technical and management classes also cover international regulations and ethical issues.

Something that is great about the program is that a big part of it is practical work. You don't just sit and study the theory, you practice.

Mauricio
second year student

STRUCTURE OF THE PROGRAM

Each year is divided into three terms: two terms of classes and one dedicated to the internship. The program trains project managers who are able to tackle a wide variety of environmental challenges. While most master's courses devoted to environmental issues only provide students with technical skills, ECOSEM also prepares you for managing positions. All the professors in the program work to help students become both technically skilled and job ready by the end of the two years.

EXPERIENCE-BASED LEARNING

Throughout the Master's Program, students have the opportunity to go on a number of field trips and company visits. They also get to put their skills into practice during two internships focused either on sciences or management.

AFTER THE MASTER?

The professional orientation of the ECOSEM program is strengthened by our industrial partners, such as Veolia, Suez, EDF, Eaux de Paris, Arcadis and many more. These partnerships present a wide range of opportunities, including scholarships, high-value internships and PhD funding. Today more than ever, the precautionary principle and the emerging related standards create an ever-increasing and permanent need for professionals with strong skills in environment management, corporate, research and public sectors.

PROGRAM STRUCTURE

Program director: Stéphane Bouchonnet

✓ Mandatory courses › Optional courses

YEAR 1

Refresher in Ecotechnologies (early September)

6 TECHNICAL COURSES

- ✓ Environmental chemistry
- ✓ Microbial ecology for environmental sciences
- ✓ Analytical Chemistry 1
- ✓ Waste water treatment
- ✓ Environmental ecotoxicology
- ✓ Exploration and statistical analysis of complex datasets

MANAGEMENT AND INNOVATION

- ✓ Energy industry value chain
- ✓ Designing projects and managing operations in the energy industry

Personal scientific project

Coriolis conferences

Field trip and company visits

INTERNSHIP

- ✓ 4-month research or industrial internship

YEAR 2

6 TECHNICAL COURSES

- ✓ Hydrology
- ✓ Solid Waste Valorization
- ✓ Soil pollution and remediation
- ✓ Drinkable water
- ✓ Analytical Chemistry 2
- ✓ Life cycle assessment and other tools to ecodesign ecotechnologies

MANAGEMENT AND INNOVATION

- ✓ Business Model in digital area
- ✓ Technology-based entrepreneurship and new business creation

Coriolis conferences

Field trip and company visits

INTERNSHIP

- ✓ 5-month research or industrial internship (24 ECTS)

TRANSVERSE COURSES

Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

Bachelor's degree in Engineering, Chemistry, Physics, Geology, or Biology. Applicants with other degrees may be considered, provided that they have a strong background in the mentioned subjects.

HOW MUCH WILL IT COST?

€ 12,000 per year

€ 80 application fee

Scholarships and financial aid are available for the best applicants

8

MASTER

ENERGY ENVIRONMENT: SCIENCE TECHNOLOGY AND MANAGEMENT

Become a leader of the energy transition

WHAT IS THE PROGRAM ABOUT?

The Energy Environment: Science Technology and Management (STEEM) Master is a two-year program, geared towards aspiring leaders of the energy transition for the benefit of top manufacturers, innovative start-ups and public organizations. For two years, the STEEM Master students are supported by world-class professors and staff. They learn from renowned École Polytechnique professors and professionals from the world of industry.

The combination of science and management in this program will give you a whole new sight on the world of engineering and commerce!

Benyamin Bidabad
second year student

STRUCTURE OF THE PROGRAM

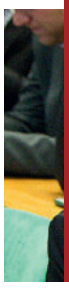
Each year is divided into three terms: two terms of classes and one dedicated to the internship. The first year of the program provides a scientific basis on Renewable Energy and Environment. During the second year, students explore the links between renewable energies and environment. Each year ends with a 4 to 6-month internship.

EXPERIENCE-BASED LEARNING

The STEEM Program emphasizes hands-on, experience-based learning by inviting you into the worlds of research and industry. To begin with, each student is assigned to one of our degree professors involved in high-level research, in order to benefit from their one-on-one mentoring.

AFTER THE MASTER?

Our graduates are ideally suited to put their technical know-how and managerial expertise to use, in the implementation of environmental policies for leading manufacturers, innovative start-ups, public organizations and governmental agencies. The STEEM program is also a gateway to a research career, with our proximity to numerous research institutions providing an ideal platform to pursue a PhD with funding from our industrial or academic partners.



PROGRAM STRUCTURE

Program director: Alexandre Stegner

✓ Mandatory courses › Optional courses

YEAR 1

3 COURSES PER PERIOD AMONG

- Continental hydrology and water resources (period 1)
- Mechanics for wind energy, an introduction (P1)
- Energy and environment (P1)
- Photovoltaïcs & Solar Energy (P1)
- Power electrical engineering for renewable energy (P1)
- Decision theory, with applications to energy systems
- Fluid structure interactions (P2)
- Meteorology and environment (P2)
- Hydro, wind and marine resources (P2)
- Valuing and managing natural resources (P2)
- Technology-based entrepreneurship and new business creation (P2)
- Sustainable Strategy & Business Models (P2)
- Material science for energy conversion and storage (P2)

1 ELECTIVE ADVANCED COURSE AMONG

- Projects in solar and wind energy: Resource and performance analysis
- Laboratory course in hotovoltaïc
- Experimental work in environmental physics

MANAGEMENT

✓ Energy Industry Value Chain

MATHEMATICS

✓ Refresher course + a numerical modeling project

1 OPTIONAL COURSE

- Python for beginners

INTERNSHIP

✓ 4-month research or industrial internship

YEAR 2

3 COURSES PER PERIOD AMONG

- Nature-based solutions to substitute fossil resources and address global change (P1)
- Chemical storage of Energy (P1)
- Wind power (P1)
- Greenhouse gases (GHG) challenges and observations (P1)
- Introduction to atmospheric composition: from processes to modelling and air quality regulations (P1)
- Organic-based materials for the 3rd generation of solar cells (P1)
- Modeling the energy and climate transitions (P1)
- Renewable thermal energy (P2)
- Environment and Development Economics of Cities (P2)
- The Economics of Energy and Sustainable Development (P2)
- Sea States, Wave Propagation and Ocean Wave Energy (P2)
- Climate Change and Energy Transition (P2)
- Thin film photovoltaïcs (P2)
- Photovoltaïc Technology in Industry (P2)
- Smart grid for renewable energy (P2)
- Advanced experimental smart grid (P2)

MANAGEMENT

✓ Designing projects and managing operations in the energy industry + a collective project

INTERNSHIP

✓ 5 to 6-month research or industrial internship

TRANSVERSE COURSES

Coriolis conferences and industry visits + Languages + Humanities and French Culture + Sports

ACADEMIC PREREQUISITES

Bachelor's degree in Engineering Science, Mechanical Engineering or Physics or «Diplôme d'ingénieur».

HOW MUCH WILL IT COST?

€ 12,000 per year

€ 80 application fee

Scholarships and financial aid are available for the best applicants

1

Marie-Paule Cani & Erwan Scornet
Artificial Intelligence
and Advanced Visual Computing

2

François Morain
Cybersecurity:
Threats and Defenses

3

Thomas Clausen
Internet of Things Innovation
and Management

MEET
THE PROGRAM DIRECTORS

Contact
gdadmissions@polytechnique.fr
to reach out to one of our
programs' directors

4

Patricia Crifo
Smart Cities and Urban Policy

5

Julie Josse & Vincent Fraitot
Data Science for Business X-HEC

6

Marie-Laure Allain
Economics, Data Analytics
and Corporate Finance

7

Stéphane Bouchonnet
Ecotechnologies for Sustainability
and Environment Management

8

Alexandre Stegner
Energy Environment: Science
Technology and Management

INTERNATIONAL
STUDENTS

With central Paris just 25km away, l'X puts within easy reach one of the world's top tourist and cultural destinations. Paris is a vibrant city and the perfect setting for an unforgettable student experience. International students relish in the opportunity to be immersed in the distinctly French way of life, one that prioritizes freedom and creativity, and welcomes the exchange of ideas. École Polytechnique is pleased to provide on-campus accommodation for its students.

ADMISSIONS
PROCESS

CHECKLIST FOR YOUR APPLICATION ONLINE

- Copies of degrees and transcripts of all previous higher education
- 2 academic references (at least one from your current institution)
- Personal statement & CV or resume
- A minimum IELS score of 6.5 or a TOEFL iBT score of 90
- An official test score report for the GMAT, GRE or TAGE MAGE is mandatory for the MSc in Data Science for Business

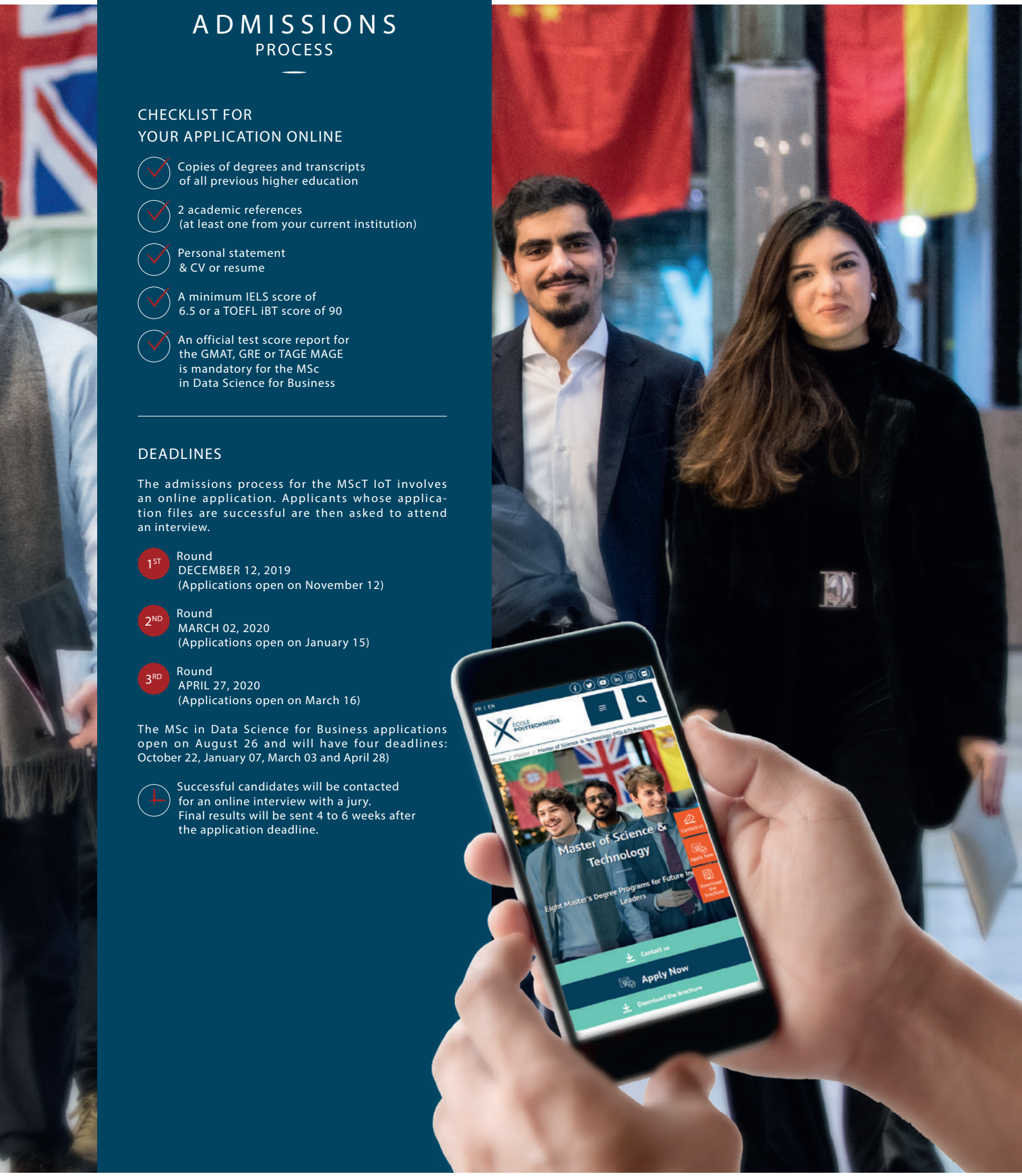
DEADLINES

The admissions process for the MScT IoT involves an online application. Applicants whose application files are successful are then asked to attend an interview.

- 1ST Round
  DECEMBER 12, 2019
  (Applications open on November 12)
- 2ND Round
  MARCH 02, 2020
  (Applications open on January 15)
- 3RD Round
  APRIL 27, 2020
  (Applications open on March 16)

The MSc in Data Science for Business applications open on August 26 and will have four deadlines: October 22, January 07, March 03 and April 28)

- Successful candidates will be contacted for an online interview with a jury. Final results will be sent 4 to 6 weeks after the application deadline.



CAMPUS LIFE

Enjoy state-of-the-art facilities across campus with 8,000m² of indoor sports facilities including two swimming pools, two gymnasiums, a fencing room, a climbing wall and a martial arts dojo. 8ha of outdoor sport facilities including a semi-artificial lake and an equestrian center.

École Polytechnique's vibrant student life can be attributed to the wide range of associations available to students. In total, our students take part in almost 250 associations in a great variety of cultural, artistic, social, scientific, religious and sporting activities.

l'X
ÉCOLE
POLYTECHNIQUE

IP PARIS

CONTACT

gdadmissions@polytechnique.fr

programmes.polytechnique.edu