ÉCOLE POLYTECHNIQUE

IP PARIS

Bachelor of Science

École Polytechnique at a Glance

Founded in 1794, École Polytechnique is France's leading institution in science and technology.

Over two centuries, alumni have profoundly marked the history of science and industry and contributed to the great advances in their fields that have shaped the world as we know it today.

Since its founding, the university has borne a long tradition of scientific excellence. Researchers, professors and alumni from École Polytechnique have received prestigious awards and distinctions, including Nobel Prizes and Fields Medals.

Located in a world-renowned science and technology ecosystem

The École Polytechnique campus is situated less than an hour from central Paris at the heart of the Paris Saclay research and business cluster. It encompasses research facilities, numerous higher education institutions and over fifty research centers of private companies.

International Reputation

Best University in France
QS 2022

Best small University in the world
Times Higher Education 2021

International University
Times Higher Education 2022

Worldwide in term of graduate employability
QS ranking 2022

Join a World-Class Program

Our Academic Approach

The Bachelor of Science is a highly selective three-year program, taught entirely in English and tailored to academically inclined students with a very strong interest in mathematics and science. École Polytechnique's well-rounded approach to learning allows students to develop a solid academic background in science, while exploring topics unrelated to pure sciences. École Polytechnique favors small class sizes with an extremely beneficial student-to-staff ratio.

École Polytechnique's Bachelor Program is officially accredited with the rank of *Licence* (French Bachelor's equivalent) by the Ministry of Higher Education and Research.

Personal Development and Coaching

Bachelor students benefit from a personal development program. They are put into groups on day one of the Program and assigned a dedicated coach who provides support. The coaches are experienced professionals who help students develop, both personnaly and physically, individually and as a group through sports and personalized accompaniment.

Tutoring from the École Polytechnique Student Community

Tutoring sessions are held in small groups throughout the year and are led by more experienced students (*Ingénieurs polytechniciens*, Master's, PhD). The aim of the tutoring initiative is to provide Bachelor students with advice to tackle their Program curriculum and offer support when they encounter academic difficulties.

ACADEMICS

A Multidisciplinary Approach

École Polytechnique proposes a multidisciplinary approach with bidisciplinary specializations. Students joining our Program will benefit from a demanding and challenging multidisciplinary scientific curriculum focused on mathematics, computer science, economics and physics. They also attend classes in foreign languages, biology, chemistry, humanities, and physical education. Bachelor students at École Polytechnique will have the exceptional opportunity to enter our laboratories from the very first year of the Program allowing them to familiarize themselves with the research environment and interact with the scientific community.

Three Double Majors

École Polytechnique's Bachelor Program offers students the choice of three double majors allowing them to customize their academic journey with a specialization:

- Mathematics and Economics
- Mathematics and Computer Science
- Mathematics and Physics

Three Double Majors

Double Major in Mathematics & Economics

The Mathematics and Economics track of the Bachelor Program offers a scientific approach to economics. It relies on the construction, analysis and interpretation of abstract models, as well as on the confrontation of theoretical conclusions with empirical data coming from the field or from controlled experiments. This double major requires strong quantitative skills and a taste for abstract thinking.

Double Major in Mathematics & Computer Science

The Mathematics and Computer Science track offers the opportunity to study the theory, experimentation and engineering that form the basis for the design and use of computers today. École Polytechnique provides a scientific and practical approach to computation and its applications. Students acquire a solid foundation in the culture and practice of modern programming, and the fundamental analytical and programming skills to solve everyday problems in sciences more efficiently and effectively. They are also prepared to continue learning other programming languages and paradigms, and the theoretical foundations of computer science itself. Students also gain practical knowledge of basic mathematical algorithms and computer programming.

Double Major in Mathematics & Physics

The students who choose the double major in Mathematics and Physics are taken on a journey through the concepts that have shaped our modern vision of the world. What is matter made of? What is the nature of light? What is the fabric of space and time? Not only do they get answers to these questions, but they also get a hands-on approach to these concepts in École Polytechnique's laboratories. Advanced courses on classical mechanics and classical electrodynamics, as well as introductory courses on statistical physics and quantum physics, provide the necessary theoretical background for mastering the concepts of motion, energy, fields, waves and multi-body systems. Students put to work their expanding mathematical toolbox, and exercise their capability for abstract thinking.

First Year

All students follow the same core courses, which provides them with the fundamental skills and knowledge needed for the rest of their academic career. Students discover the scientific disciplines, allowing them to choose the double major they wish to study accordingly.

List of courses available in the first year of the Bachelor Program:

Semester	Course
Fall	Linear Algebra
Fall	Introduction to Analysis
Fall	Introduction to Economics
Fall	Physics I: Mechanics And Heat
Fall	Introduction to Computer Programming
Fall	Maths in Practice: How to Write Maths
Fall	Maths in Practice : Calculus
Fall	Discovery labs
Fall	Sports
Fall	Seizing my new life at university
Fall	The art of decision making
Fall	A Healthy Mind in a Healthy Body

Semester	Course
Spring	Discrete Mathematics
Spring	Integral and Differential Calculus
Spring	Introduction to Numerical Analysis
Spring	Advanced Programming
Spring	Maths in Practice: Vector and Fourier Analysis
Spring	Introduction to Algorithms
Spring	Topics in Economics
Spring	Physics II: Electromagnetism and Light
Spring	Beginner's Physics Lab II
Spring	Biology
Spring	General Chemistry
Spring	Mathematical Modeling
Spring	Web Programming
Spring	Applied Physics
Spring	Meeting a Professional

Second Year

Starting the second year, students have chosen one of the three double majors available. They stay at École Polytechnique for the duration of the second year. Depending on the double major, different courses are offered:

Semester	Course	Mathematics & Computer Science	Mathematics & Economics	Mathematics & Physics
Fall	Euclidean and Hermitian Spaces	✔	✔	✔
Fall	Topology and Multivariable Calculus	✔	✔	✔
Fall	Introduction to Probability		✔	
Fall	Introduction to Statistics		✔	
Fall	Object-oriented Programming in C++	✔		
Fall	Design and Analysis of Algorithms	✔		
Fall	Intermediate Microeconomics		✔	
Fall	Intermediate Macroeconomics		✔	
Fall	Classical Mechanics	✔	✔	✔
Fall	Wave Optics and Radiation	✔	✔	✔
Fall	Advanced Lab	✔	✔	✔
Fall	Cell Biology	✔		✔
Fall	Introduction to Reactivity	✔		✔
Fall	Algorithms for Discrete Mathematics		✔	
Fall	Logic and Proofs	✔	✔	✔
Fall	Foreign Languages	✔	✔	✔
Fall	Sports	✔	✔	✔
Fall	A Healthy Mind in a Healthy Body	✔	✔	✔
Fall	Group volunteering	✔	✔	✔
Fall	Genius – online mentoring	✔	✔	✔

Semester	Course	Mathematics & Computer Science	Mathematics & Economics	Mathematics & Physics
Spring	Quadratic Forms and Applications	✔	✔	✔
Spring	Series of Functions, Differential Equations	✔	✔	✔
Spring	Numerical Linear Algebra	✔	✔	✔
Spring	Machine Learning	✔	✔	
Spring	Computer Architecture	✔		
Spring	Introduction to Formal Languages	✔		
Spring	Introduction to Networks	✔		
Spring	Introduction to Econometrics		✔	
Spring	Introduction to Finance		✔	
Spring	Topics in History of Economics throught since 1945		✔	
Spring	Classical Electrodynamics			✔
Spring	Introduction to Quantum Physics			✔
Spring	Waves and Heat Transfer in Geophysics			✔
Spring	Advanced Lab II			✔
Spring	Atoms and Lasers			✔
Spring	Molecular Genetics	✔		✔
Spring	Environment and Energy	✔		✔
Spring	Speech contest	✔	✔	✔
Spring	Sustainable development	✔	✔	✔

Third Year

Courses

List of courses available in the third year:

Semester	Course	Mathematics & Computer Science	Mathematics & Economics	Mathematics & Physics
Fall	Measure and Integration	✔	✔	✔
Fall	Topology and Differential Calculus	✔	✔	✔
Fall	Algebra and Arithmetics	✔	✔	
Fall	Asymptotic Statistics	✔	✔	
Fall	Probability: Stochastic Processes	✔		
Fall	Functional Programming	✔		
Fall	Compilers	✔		
Fall	Computer Science Project	✔	✔	
Fall	Constraint Logic Programming	✔		
Fall	Advanced Microeconomics	✔	✔	
Fall	Advanced Macroeconomics	✔	✔	
Fall	Advanced Quantum Physics			✔
Fall	Introduction to Condensed Matter Physics			✔
Fall	Advanced Lab III			✔
Fall	Solid Mechanics			✔
Fall	Biology Practicals	✔		✔
Fall	Technological Tools for Chemistry	✔		✔
Fall	Masterpieces of Western Literature: Sea and Sailors	✔	✔	✔
Fall & Spring	Foreign Languages	✔	✔	✔
Fall & Spring	Sports	✔	✔	✔
Fall	Diversity Report and Active Volunteering	✔	✔	✔

Semester	Course	Mathematics & Computer Science	Mathematics & Economics	Mathematics & Physics
Spring	Algebra and Geometry	✔		✔
Spring	Convex Optimization and Optimal Control	✔	✔	✔
Spring	Image Analysis	✔	✔	✔
Spring	Numerical Methods for ODEs	✔	✔	✔
Spring	Measure and Integration – Condensed	✔	✔	✔
Spring	Topology and Differential Calculus – Condensed	✔	✔	✔
Spring	Complexity	✔		
Spring	Concurrent and Distributed Computing	✔		
Spring	Computer Graphics	✔		
Spring	Health and Development Economics		✔	
Spring	Industrial Organization		✔	
Spring	Social and Environmental Responsibility of Business		✔	
Spring	International Trade		✔	
Spring	Introduction to Research Frontiers A, B		✔	
Spring	Computational Economics		✔	
Spring	Thermodynamics and Statistical Physics	✔	✔	✔
Spring	Fluid Mechanics 3			
Spring	Introduction to Subatomic Physics	✔	✔	✔
Spring	Biomedicine	✔		✔
Spring	Mastering the Synthesis and Transformation of Molecules	✔		✔
Spring	Seminar: Mathematical Models	✔		
Spring	Fundamentals of Organizations	✔	✔	✔
Spring	Diversity Report and Active Volunteering	✔	✔	✔

Third Year

Exchange Semester

École Polytechnique offers its students the opportunity to acquire further international experience in their third year. Selected Bachelor students can thus spend the Fall semester abroad in a partner university. **Find out more about our list of partners on page 13.**

Bachelor Thesis

During the second semester of their third year, students work on a Bachelor Thesis, a lab-based research internship. It typically takes place over at least an eight-week period and is undertaken in a lab at École Polytechnique or at a partner institution. The thesis provides students an opportunity to pursue a directed, focused, and individual research project that immerses students in the life of a research lab. It is linked to the student's double major and is consistent with the Bachelor Program's focus on research. Students apply rigorous research methods to their project, while developing strong working relationships with research lab members, and experiencing first-hand the functioning of a lab. The Bachelor Thesis is closely supervised and monitored by a Referent Instructor at École Polytechnique and an Internship Tutor in the host organization.

For the last three months, from April to June, students come back to École Polytechnique for a half term of classes.

After the Bachelor Program

Admitted into the best universities in the world, here are **some examples** of institutions and Master's degrees that École Polytechnique Bachelor students pursue their studies in after graduating.

Double major in Mathematics & Computer Science

Columbia University Master in Vision, Graphics, Interaction and Robotics
University of Cambridge Master in Machine Learning and Machine Intelligence
École Polytechnique MSc&T Artificial Intelligence & advanced Visual Computing

Double major in Mathematics & Physics

MIT PhD track in Physics
ETH Zurich Master in Physics
Technical University of Munich Master in Quantum Science and Technology

Double major in Mathematics & Economics

University of Oxford Master in Economics
HEC Paris Master in Management
ENS Ulm Diploma of the Ecole normale supérieure in Economics

And so much more!

80%
of students continuing their studies abroad
in the **World Top 40 Universities**

70%
International and dual national students

35%
Female students

38
Countries represented

40%
International Faculty

7
Language Options

An International Experience

A Class with an International Profile

École Polytechnique is proud to recruit students from all around the world. The aim is to provide students with a solid international profile, allowing them to confront the challenges of the multicultural world in which they will evolve. In order to work in France or abroad, international expertise and intercultural skills are essential for future graduates.

Learning and Perfecting Foreign Languages

During the Program, all students take courses* in foreign languages:

- Beginners' courses (A1 level) are available for French, Italian, Chinese, German and Russian
- Intermediate courses (A2-B1 level) are available for French, English, German Spanish , Russian, Italian, Chinese and Japanese
- Advanced courses (B2-C1 level) are available for French, German, Spanish and Chinese
- History and Culture courses are available for French

**These courses are subject to sufficient demand from students and can vary from one year to the next.*

Advanced English classes in the first semester are also offered to students who want to perfect their English in order to get the most out of their curriculum from day one.

Studying Abroad

Selected Bachelor students can go abroad for a semester in the third year. Here is the list of universities with which École Polytechnique has a partnership in place:

Asia Pacific

Peking University, *China*
Shanghai Jiao Tong University, *China*
Hong Kong University of Science and Technology, Hong Kong, *China*
National Chiao Tung University, Taiwan, *China*
Korea Advanced Institute of Science and Technology, *South Korea*
POSTECH, *South Korea*
Seoul National University, *South Korea*
Keio University, *Japan*
Tokyo Institute of Technology, *Japan*
University of Tokyo, *Japan*
Kyoto University, *Japan*
University of Melbourne, *Australia*

America

Dalhousie University, *Canada*
University of Toronto, *Canada*
McGill University, *Canada*
Georgia Tech, *USA*
University of California, Berkeley, *USA**
University of California, San Diego, *USA*
Tecnológico de Monterrey, *Mexico*
Pontificia Universidad Católica de Chile, *Chile*
Universidad de Chile, *Chile*
University of Chicago, USA
Brown University, USA

Europe - Middle East

Technical University of Denmark, *Denmark*
King's College, *UK*
École Polytechnique de Bruxelles, *Belgium*
Technical University of Munich, *Germany*
Ecole Polytechnique Fédérale de Lausanne, *Switzerland*
ETH Zurich, *Switzerland*
Bocconi University, *Italy*
Politecnico di Milano, *Italy*
American University of Beirut, *Lebanon*

** For all universities with which we have exchange agreements, students only have to pay the standard tuition fees to École Polytechnique, except for a very limited number of universities with an asterisk where tuition fees from the partner university also apply.*

World-Class Research

480
Researchers and professors

39%
International Faculty

24
Academic and Research Chairs

23
Research Laboratories

570 PhD
and post-doctoral students

1,400
Publications per Year

Driving Tomorrow's Science and Technological Innovation

At the heart of a vibrant scientific community, our students interact with internationally renowned scientists, engineers, managers, entrepreneurs and CEOs of major companies.

The Research Center

École Polytechnique's Research Center combines the most fundamental aspects of research with the pursuit of progress in the main applied fields in order to meet future scientific, technological and societal challenges. Bachelor students have the opportunity to discover the laboratory environment from day one of their Program, providing an exceptional learning experience. Laboratories are open to all students for projects.

Internships

Once in the Program, students have the opportunity to do a 4- to 8-week internship during the summer in a lab or in a company. This opportunity enables students to experience both the corporate and research worlds.

Entrepreneurship and Innovation

The Drahi X-Novation Center is dedicated to entrepreneurship and innovation at École Polytechnique. This unique space provides students with a business incubator and accelerator where startups can expand and improve their business models. Bachelor students can take advantage of this center, which fosters creativity and promotes experimentation from their first-year onwards.

The Drahi-X is a place where different student populations come together to share ideas and learn from each other, as well as from entrepreneurs and professionals. It's the ideal spot to exchange tips and tricks, and to let your imagination run wild, while having access to cutting-edge technology.

The École Polytechnique Experience

Conveniently located only 20 kilometers south of Paris, our campus is nestled among 160 hectares of nature, with easy access to one of the world's most exciting cities. On our campus, no matter what your interest might be, you'll find a way to get involved.

On-campus Accommodation

All students for the Bachelor Program are housed on campus for the duration of the Program, which allows students to fully partake in our vibrant community, while developing team spirit and solidarity. Students (including international students) can be eligible to receive a monthly housing allowance from the French government.

The Bachelor Student Organization

The Bachelor student organization (L'ORE) contribues to every aspect of Bachelor students' life on campus, including events, sports, orientation, student trips, social events, and so on. The L'ORE helps new students figure out everything there is to know about the campus and makes sure that student life is as exciting as they could have imagined. It also manages the creation of student committees designed for and by Bachelor students, in order to foster a diverse, dynamic and inclusive student life that fits with their schedule and workload!

International Student Office

At École Polytechnique, we have a dedicated office whose job is to make sure that all international students have the support they need before arriving and for the duration of their study Program.

Preparing your arrival

All non-EU students receive personalized advice about visa procedures in relation to their country of residence, as well as the insurance they will need to take out in order to be fully covered for their personal belongings and healthcare.

During your stay in France

- Welcome to France Information Sessions.
- Organization of events throughout the year with the Bachelor team.
- Giving general advice on aspects of living in France and supporting students with any administrative procedures they may have to manage, such as visa renewals.


FINISHER

Outstanding Sports Facilities that Make On-campus Life Unique

Sports remain a key strength of the École Polytechnique experience. Our students enjoy outstanding facilities, enabling them to play a large range of sports and to develop skills such as leadership, teamwork and fair play.

Physical Education Classes

Students have two mandatory hours of sports per week and also have the opportunity to play the sport of their choice in their free time, usually over the weekend. They benefit from outstanding facilities and a wide range of sports: such as climbing, swimming, boxing, bodybuilding, rowing, judo, badminton tennis, etc.

Although the curriculum of the Bachelor Program is very demanding, some athletes and well-organized students still find some time to practice sports with students from the other programs. Some also take part in sporting events and competitions on campus.

The Sports Club

Students can benefit from incredible indoor sports facilities, ranging from swimming pools and gyms, to a climbing wall and fencing room. Outdoors, a wide variety of sports infrastructure is also on offer with fields for team sports, as well as horseback riding and rowing on our very own lake!

École Polytechnique's Sports Club is open to all students for an annual fee of just €25.

Admission Criteria

General Admission Requirements

Applicants must meet one of the following requirements

– They must currently be enrolled in their last year of secondary education, which must be completed before the start of the Bachelor Program.
– Or have recently graduated from secondary education (either currently taking a year off or be currently enrolled in post-secondary education).

Students are firstly selected on their strong academic background, especially in mathematics and science. École Polytechnique also values exemplary, extensive achievement in any intellectual or creative endeavor. This includes accomplishments in extracurricular activities such as performing arts or athletics, scientific competitions, internships, leadership in your school or community, volunteering, etc.

Specific Admission Requirements

Admission to École Polytechnique's Bachelor Program is highly competitive and is designed for top students with very high potential, who are capable of following a rich and demanding curriculum.

Applicants to the Program should also meet the following specific requirements:

- have an overall strong academic average
- have taken advanced mathematics courses, and at least one advanced science course
- have a good level of English (Common European Framework of Reference for Languages level C1).

Admissions requirements by high school curriculum

French Baccalaureate:
For students taking the Baccalaureate exam in 2022 and after: advanced Mathematics and another scientific subject to be chosen in *1ère* and to be kept in *Terminale*. The third optional subject for *1ère* is up to the student.

International Baccalaureate:
Mathematics and at least one science course should be Higher Level.

North American education:
Honors or AP classes in Mathematics and at least one scientific subject are preferred.

British-patterned education:
A-level program: Mathematics and at least one science course should be Higher Level.

Other curriculum:
Other curriculums are also accepted if applicants have studied mathematics at high level and another scientific subject.

How to Apply?

Your application must be submitted online and must include the following:

1. Scanned copies of your transcripts for the last four academic years, completed and in progress (i.e. if you are currently in 12th Grade, please provide your transcripts from 9th, 10th and 11th Grade)
2. Two references (preferably academic)
3. Personal statements (form to be completed in the online application)
4. CV/Resume (form to be completed in the online application)
5. English language certificate: IELTS, TOEFL iBT or Cambridge English tests (Advanced (CAE) and Proficiency (CPT))

Shortlisted applicants are invited to a 50-minute interview via videoconference.
The interview is conducted entirely in English and is divided in 2 parts:

20 minutes: general scientific culture and motivation for joining the Program
30 minutes: mathematics questions based on the secondary education curriculum
Admissions decisions are based on the quality of the application file and the interview score.

Admissions Calendar

There are three rounds of admission this year.
Students who have not been offered admission for one round cannot reapply for subsequent rounds.

Candidates can only apply once per academic year to the Bachelor Program, either via Parcoursup or via Ecole Polytechnique's online application system. It is not possible to apply to the Program via both platforms.

Rounds	Application Deadlines	Interview Dates (for shortlisted candidates only)	Final Admission Results
First round	September 7 to October 12, 2022	From December 2022 to January 2023	Early February 2023
Second round	November 30, 2022 to January 3, 2023	From March to April 2023	End of April 2023
Third round	February 15 to March 21, 2023	May 2023	Mid-June 2023

Students can **alternatively** apply via Parcoursup (France's standardized higher education application website – in French only). Go to Parcoursup's website **www.parcoursup.fr** for more information and deadlines.

Application fees: An application fee of €95 is required upon application submission.
This can be paid by credit card or bank transfer.

Tuition Fees

Tuition Fees

2022 Annual Tuition Fees:
> €14,600 per year for EU and EEA students
> €18,200 per year for students from outside the EU

Financial Aid

At École Polytechnique, we admit the most talented undergraduate students from all over the world and we strive to attract and reward the very best students, regardless of their financial situation. To this end, eligibility for excellence scholarships and tuition waivers is reserved for students who are admitted with honors in each round of admission. There are two categories of financial aid: merit-based and need-based. These categories are not mutually exclusive.

Merit-based financial aid

Excellence Scholarship

The École Polytechnique Foundation offers a limited number of scholarships based on academic excellence to help us attract and reward the very top students worldwide. Each scholarship award can be up to €4,000 per year for 3 years. The Excellence Scholarship's renewal is subject to academic success and attendance in the Program.

Need-based financial aid

Tuition Waivers

École Polytechnique offers tuition waivers based on students' financial needs. Tuition waivers range from €1,000 up to €14,400 (depending on a student's tuition fees). Please note that even the highest tuition waiver requires a €1,400 annual tuition fee. Tuition waivers only cover tuition costs; any other expenses are the responsibility of the student.

Women in Science Scholarship

Historically, women have been underrepresented in scientific fields of study. At École Polytechnique we take this issue seriously and strive to promote gender equality. To this end, the École Polytechnique Foundation has created a specific scholarship for exceptional female students admitted to the Program. The scholarship award is €4,000 (for the 1st year only) and paid in 10 monthly installments and only offered during the first year.
Available to all girls, not only admitted with honors.

Interest Free Loans via the École Polytechnique Foundation

Students who have a fiscal warrantor in France can apply to an Interest Free Loan through the École Polytechnique Foundation (limited number).
Available to all students, not only admitted with honors.

www.programmes.polytechnique.edu

Programs

Ingénieur Polytechnicien Program

Bachelor of Science

Master of Science and Technology

PhD Track

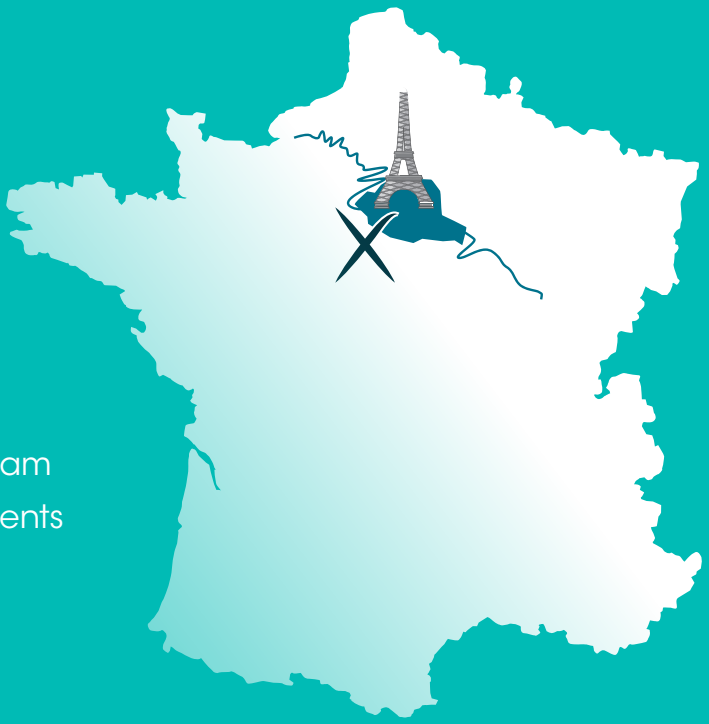
Executive Master

Executive Education

E-Learning

International Academic Exchange Program

Internship Program for International Students



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