HOW TO FIND ENSIIE
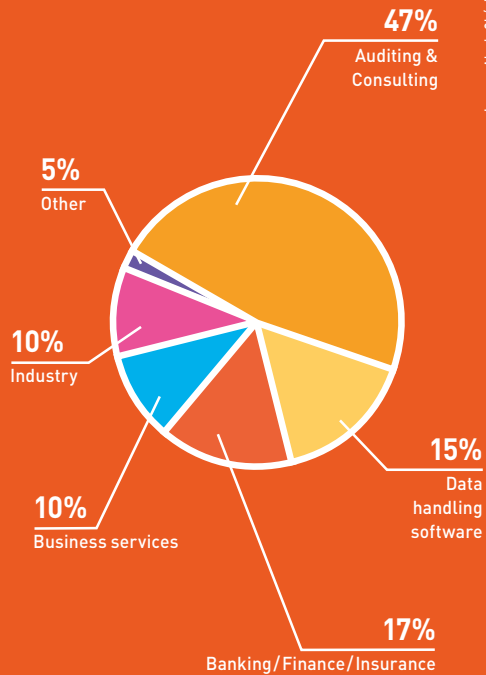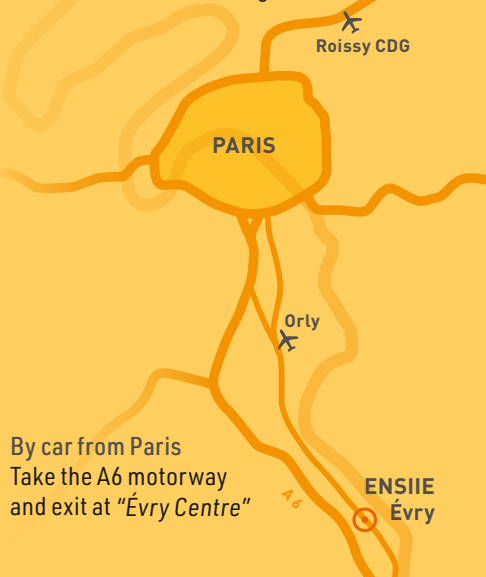
From Paris by train
RER D to Évry-Courcouronnes
Exit at "*parc Paul Sabatier*"
and then follow ENSIIE signs

Roissy CDG

PARIS

Orly

By car from Paris
Take the A6 motorway
and exit at "*Évry Centre*"

A6

ENSIIE
Évry

47%
Auditing &
Consulting

5%
Other

10%
Industry

10%
Business services

15%
Data
handling
software

17%
Banking / Finance / Insurance

École nationale
supérieure
d'informatique
pour l'industrie
et l'entreprise

École associée de
INSTITUT
Mines-Télécom

université
PARIS-SACLAY

ensiie

PARIS – ÉVRY

at the heart of current challenges

MSC IN APPLIED MATHEMATICS

MATHEMATICAL SKILLS

To succeed in this Master's degree
and enjoy its content, you need
a strong mathematical background:
an aptitude for mathematics is required
and has to be evidenced by university-
level credits you have earned in Statistics,
Mathematical Optimisation, Analysis,
Differential Equations and Probability.

ENGLISH SKILLS

If your first language is not English
or your first degree is not from
a British or US University, you will
need to provide evidence of your ability
at spoken and written English.

COMPUTING SKILLS

It is important for an Applied Mathematics
practitioner to be able to use computers fluently
to model and analyse new problems. This will
involve programming in a high-level language.
Applicants should have the following as part of
an earlier degree: an undergraduate programming
course (in any language e.g. R, MATLAB, C,
C++, Fortran, Python); an understanding of flow
control; the ability to use methods / functions.

COST OF STUDYING AT ENSIIE

Approximately € 1,500 per student.
The French government provides substantial
funding for higher education, which is why
ENSIIE students enjoy low tuition fees.

ÉTABLISSEMENT PUBLIC

Membre de la Conférence des Grandes Écoles
EUR-ACE®
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Diplôme agréé par la Commission des Titres d'Ingénieur

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Fax : +33 [0] 169 367 305

Contact international relationships :
rel-int@ensiie.fr

Site internet des élèves :
www.iiens.net

This one-year Applied MSc programme starts in the autumn semester and is designed to steer your career towards the mathematics jobs that are in high demand across all industries. The syllabus combines rigorous mathematics with practical experience: you will learn to develop computational methods and apply them to model, study and solve interdisciplinary problems.

MSC IN APPLIED MATHEMATICS

ENGLISH-TAUGHT MASTER'S DEGREE IN APPLIED MATHEMATICS GRANTED BY ENSIIE

PROGRAM INFORMATION

The programme consists of 60 ECTS credits in Semesters 1 and 2. It also includes a full-time internship in the spring. Please bear in mind that course offerings and availability are subject to change as curriculum develops to reflect a modern degree program.
This Applied Mathematics MSc programme is offered on a full-time basis on our campus in Évry. All teaching is carried out in English and classes are scheduled from the beginning of September to the beginning of April. In this Applied MSc programme, you will:
• acquire fundamental tools that will allow you to follow advanced courses in Applied Mathematics;
• become familiar with a mathematical approach to real-world industrial problems.

ELIGIBILITY

Entry requirements: to be eligible for a place on the Applied Mathematics MSc you must have at least an upper second class degree, or its equivalent, in a numerate discipline such as (but not limited to) mathematics, engineering, computer sciences. Previous study of applied mathematics, probability and differential equations at university level is required. Previous programming experience, including the use of computer programming in university-level studies, is also required.

CORE MODULES
TAUGHT IN ENGLISH

SEMESTER 1

The first semester is composed of all the following modules. The compulsory courses will build strong applied mathematical and computational foundations.

DISCRETE TIME STOCHASTIC PROCESSES S3-[PST]
The objective of this Unit is to study the discrete time stochastic processes, Martingales and Markov chains in particular.

DATA ANALYSIS S3-[MAD]
Data analysis is a powerful tool defined as the process of extracting data, analyzing it from many dimensions, exploring large complex data sets, including those in very large databases, producing a summary of the information in a useful form that identifies relationships within the data.

OPERATIONS RESEARCH S3-[MRO]
Operations Research (OR) is one of the main areas of application of computers in the industry. It includes a set of methods, conceptual models and tools to streamline and optimize the architecture and operation of complex systems (production, network, transport, etc.), technical or techno-economic choice regarding products and, generally, the process of decision-making in a company.

REGULARISED REGRESSION S3-[MLG]
The course presents the theoretical and practical elements of regression models that are more sophisticated than the linear model. It aims to provide tools for predicting data as well as approaches that take non-linearities into account.

SEMESTER 2

The second semester is also composed of compulsory courses, building on the skills gained in Semester 1.

MODELING AND SIMULATION S4-[MESIM]
The training course introduces students to the simulation methods used in statistics, especially in Bayesian statistics, maximisation methods and quadrature computations in high dimensions which are necessary to deal with complex models used in fields like econometrics, finance, genetics, ecology or physics.

STATISTICAL MODELING S4-[MOST]
This course teaches a set of methods used for identifying the existing relationship between the response and the variables of a random phenomenon. Focusing on supervised classification and regression, the syllabus includes the various issues of modeling (analysis and / or prediction of a phenomenon).

FINANCIAL INSTRUMENTS AND MODELS S4- [IMF]
The goal of this course is to present the basic concepts in mathematical finance, with a focus on the mathematical approach (discrete case) and the financial market approach.

OPERATIONS RESEARCH: TOOLS AND COMPLEMENTS S4- [CORO]
The objective of this course is to further develop students' knowledge in linear programming by giving them the opportunity to model problems, implement methods and use mathematical programming software.

STOCHASTIC CALCULUS S4- [MCS]
This course introduces fundamental mathematical concepts that are applied in many fields, especially in economics and finance. For instance, stochastic calculus is widely used for portfolio management, pricing and hedging derivatives. This module is essential for students who wish to work in finance and financial engineering.

ANALYSIS OF PARTIAL DIFFERENTIAL EQUATIONS (PDES) S4-[ANEDP]
The first part is a theoretical course for solving Partial Differential Equations with abstract existence theorem (Lax-Milgram). The second course is about the finite element methods for computing numerical solutions to PDEs.

CREATIVE CODING S4-[CC]
Discover the artistic creative processes linked to the digital world and explore the various dynamics that develop between engineers and artists. This course entails a creative use of IT tools.

CONCEPTION OF A DIGITAL PIECE OF ART S4- [ANU]
A creative approach to IT concepts and tools (Arduino, 3D printer, salvage, etc.). Investigate the new relationships that develop between engineers and artists, and give your IT skills a creative spin.

ADMISSIONS TO MASTER 2 PROGRAMS

université PARIS-SACLAY

You can apply to Paris-Saclay University for an M2 program once you have completed these 12-month master's courses. When all requirements are fulfilled, students can apply to the following master's degrees:
• **Mathematics and Applications at Paris-Saclay University** Specialty "Financial Engineering" (IIF)
• **Master in Computer Science at Paris-Saclay University** Specialty "Operations Research" (MPRO) Specialty "Machine Learning, Information and Content" (AIC)
• **Master of Information and Data Science (TRIED) at Paris-Saclay University**

2ND YEAR

MASTER 2
(choose one master's degree from the list)

FINANCIAL ENGINEERING (IIF)
OPERATIONS RESEARCH (MPRO)
MACHINE LEARNING, INFORMATION AND CONTENT (AIC)
INFORMATION AND DATA SCIENCE

PARIS-SACLAY UNIVERSITY

1ST YEAR

MSC IN APPLIED MATHEMATICS

ENSIIE - ÉVRY