



**Ensai** | THE NATIONAL SCHOOL FOR STATISTICS AND DATA ANALYSIS IN FRANCE

## LOCATION

ENSAI is located on the Ker Lann Campus, near the cosmopolitan city of Rennes, France. A 2-hour train ride from Paris, Rennes is known for its numerous cultural events and festivals, as well as being a lively college city with two major universities plus a number of graduate schools. Rennes is the capital of Brittany, a region renowned for some of France's most spectacular coastline and landscapes.



Place du Champ-Jacquet - Rennes



Pink Granite Coast - Brittany

## ACCOMODATION

All Ker Lann Campus residence halls are open to foreigners.

→ <http://www.campuskerlann.com/categorie/logement/>

Many of ENSAI's foreign students are warmly welcomed at Résidence University.

Foreigners who follow the intensive summer French program are hosted within families for two months.

## ADMISSION REQUIREMENTS

- All applicants must have a minimum of 4 years of higher education (at least a 4-year Bachelor's, or the first year of a Master's). Strong mathematical and computer science backgrounds are required.
- Applications are pre-selected based on candidates' degrees, level, and skills. Final admission is granted following a personal interview (in person or via videoconference).

## APPLYING

➤ Full procedures, applications and deadlines available at [www.ensai.fr](http://www.ensai.fr) under "Admission > MSc in Big Data"

### COST

- 8,000 € (inclusive of all tuition, registration, and fees for entire program)
- + 2,000 € for intensive Summer French program (for foreigners not possessing B2 CEFR minimum level in French)

*N.B. Possibility for reduction in program cost for applicants from partner institutions*

# Master of Science BIG DATA IN ENGLISH

**In 2016, there will be almost half a million jobs for qualified data scientists, plus a need for 1.5 million executives and support staff who have an understanding of data.**

The McKinsey Global Institute, 2011

## WHY ENSAI?

- **Reputation** ENSAI is a highly-esteemed engineering school (one of the prestigious French *Grandes Écoles*) with cutting-edge expertise, traditionally offering a unique, three-fold program in Statistics, Computer Science and Economics.
- **High Employment** Highly-skilled graduates enjoy an exceptional employment rate.
- **Human Scale** Small student body for MSc program receives a personalized welcome, and the faculty members of ENSAI's two research teams are accessible to students.
- **International Vision** Partnerships with prominent institutions around the world have been fostered to prepare students for international careers (eg. Humboldt-Universität zu Berlin, University of Warwick, Tongji University, Colorado State University).

## BIG DATA IS CHARACTERIZED BY THE 3Vs

Graduates will master all of them by having the following abilities:

<b>Volume</b>	To analyze large volumes of data using their strong background in machine learning, statistics, data mining, business intelligence and high-performance computing.
<b>Velocity</b>	To extrapolate reliable information rapidly from masses of data thanks to a sound understanding and mastery of cloud computing, highly-scalable data-storage paradigms (eg. NoSQL), and modern tools for massively distributed data processing, such as Hadoop and Pig.
<b>Variety</b>	To combine and interpret multiple data sources whilst extracting value from structured, unstructured, textual, and functional data.



Accreditation:  
French Ministry of  
Higher Education  
and Research  
in 2014

### STRONG POINTS OF THE PROGRAM

- **Data Scientist:**
  - a career with rapidly-increasing employment worldwide
  - a unique field where Statistics and Computer Science converge
- **Network systems** provide students with a high-performing clustering calculator and virtual computers, facilitating access to their work and all data from any location.

### SOFTWARE AND LANGUAGES TAUGHT

Java, Map Reduce,  
Hadoop, Mahout, R, SAS





## COURSE AIMS

Students will:

- Learn the theoretical aspects and the practical skills needed to become a Data Scientist in order to meet the growing needs of a large variety of companies and organizations, such as retailers, manufacturers, financial markets, insurance companies, healthcare providers, or public administrations
- Acquire the necessary tools to handle and analyze massive amounts of heterogeneous data
- Master the statistical methods essential for rapidly extracting information from multiple datasets and the IT methods suitable for stocking the data



## CALENDAR AND PROGRAM

The structure of the program is composed of two semesters of coursework at ENSAI, which are followed by a five-month paid internship in France or abroad within the professional world or academia/research laboratories. A two-month French program precedes the start of the program.

July - August	Semester 1	Semester 2	
	September - December	January - April	May - September
Intensive French Summer Program 6 credits	Statistics Track OR Computer Science Track 11 credits	Common Courses 24 credits	Internship 25 credits
	Common Courses 16 credits		
	Weekly French evening classes 2 credits	Weekly French evening classes 2 credits	

## CURRICULUM

### Semester 1 (two-fold)

<b>Statistics Track</b> for students with computer science backgrounds <ul style="list-style-type: none"><li>■ Advanced Topics in Probability and Statistics (45h)</li><li>■ Advanced Topics in Data Analysis (40h)</li></ul>	OR	<b>Computer Science Track</b> for students with statistical backgrounds <ul style="list-style-type: none"><li>■ Advanced Computer Science (45h)</li><li>■ Computer Networks (40h)</li></ul>
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<b>Common courses</b> <ul style="list-style-type: none"><li>■ Data Mining and Statistical Learning (40h)</li><li>■ Databases (40h)</li><li>■ Sampling Methods (40h)</li><li>■ Operating Systems (40h)</li></ul>	<b>Including:</b> Advanced Regression Models, Monte-Carlo Methods, Big Data Databases, Cloud Computing
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### Semester 2

<b>Common courses</b> <ul style="list-style-type: none"><li>■ Complex Data Modeling (40h)</li><li>■ High-Dimensional Statistics (40h)</li><li>■ Big Data Analytics Tools (40h)</li><li>■ Statistical Software (40h)</li><li>■ IT Security (40h)</li><li>■ Final Project on Big Data (40h)</li></ul>	<b>Internship</b> <ul style="list-style-type: none"><li>■ 5-month professional experience followed by final report and jury defense</li></ul>	<b>Including:</b> Functional Data Analysis, Penalized Regression, MapReduce, Hadoop Technologies
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## LANGUAGE OF TEACHING

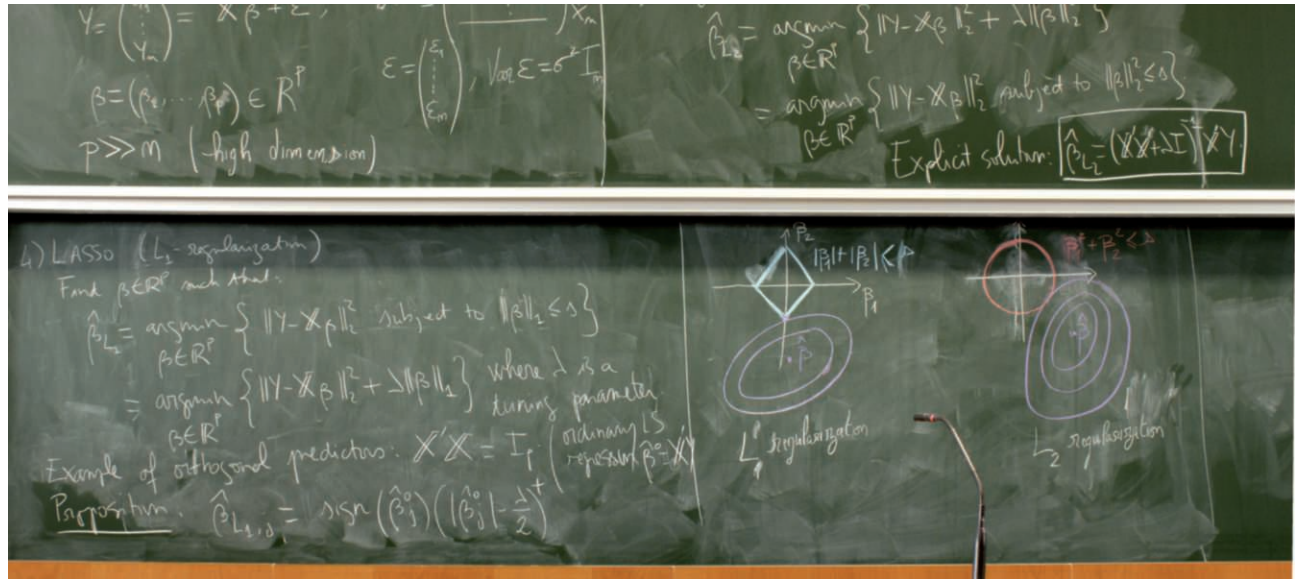
All courses and examinations occur in English.

Non-French speakers benefit from intensive French courses the preceding summer and weekly evening French classes during the academic year. This allows them to acquire the linguistic skills necessary for daily life and cultural integration.

### LANGUAGE REQUIREMENTS

- Language 1: English** (all coursework and examinations)
- Minimum level of B2 CEFR
  - Common certificates accepted (eg. TOEIC, TOEFL, IELTS, Cambridge CAE)

- Language 2: French** (practical life)
- No minimum level. Admitted students with French skills may be exempt from language courses



## PROFESSIONS

Graduates of the program are skilled **Data Scientists**

In addition to doctoral possibilities in research, they will have numerous career opportunities in international corporations and data start-ups in the following areas:

Digital Marketing	Business Analytics	Risk Management	Yield Management	Industrial applications
Supply and distribution	Healthcare industry	Social networks analysis	Research and development in scientific domains	Software industry