

# DATA SCIENCE

## MASTER OF SCIENCE

### ACCREDITATION

Internationally recognized Master's Degree in Information Technologies (IT) accredited by the French Ministry of Higher Education and Research.

National Accreditation Reference: 1702068Z

Co-accredited with the University of Southern Brittany (Université de Bretagne Sud, UBS).

### KEY WORDS

Data Science / Computer Science Artificial Intelligence / Business Intelligence/ Data Warehouse / Knowledge Discovery / Data, Text, Web and Social Network Mining / Statistical Inference Knowledge Management / Knowledge- Based Systems / Information Systems Decision Support Systems / Decision Aiding

### SCHOOL PROPOSING THE MASTER

IMT Atlantique, a «grande école» which is part of Institut Mines-Télécom, a leading French higher education and research force in engineering, with 12,500 students.

The University of South Brittany is a multidisciplinary institution with academic programmes from bachelor's level to the doctorate in different areas : arts, social sciences, engineering, computer science, biochemistry, mathematics, law, economics and business.

### LOCATION

Classes are given in Brest and Vannes which are both located in Brittany, one of the most visited areas in France due to its breathtaking landscapes and seascapes as well as its numerous historical treasures. Brest campus (IMT Atlantique) is located in the centre of the Science Park overlooking the entrance to the Bay. It includes halls of residence and cafeteria. Vannes campus (UBS) is close to the Gulf of Morbihan and offers facilities nearby.

### STRONG POINTS OF THE PROGRAM

Besides being flagships of European institutes of higher education, IMT Atlantique and UBS are affiliated with many networks of alliances in France and abroad, as well as a pole for high- level research activities. Strong links with industry have made it possible to reach excellence in pedagogical methods, project-based teaching and corporate research.

Almost half of the students come from outside France, with more than 50 nationalities on our campuses. This fact reflects a very high intercultural dimension and results in an interesting, enjoyable, multicultural everyday life experience.

#### iSchools

Furthermore, the teaching staff consists of internationally renowned specialists Information technologies and Engineering. These competencies have made IMT Atlantique the only French institution accredited as a school of information studies ([www.ischool.org](http://www.ischool.org)).

### INDUSTRIAL PARTNERS (COURSES AND INTERNSHIPS)

Arkéa Crédit Mutuel de Bretagne, BNP Paribas Assurances, Dassault Aviation, Ifremer (French Research Institute for Exploration of the Sea), INSERM (National Health and Medical Research Institute) & Stat Life, Orange Labs / France Telecom R&D, SAS, SHOM (French Hydrographic and Oceanographic Institute), Thales Aerospace and Research & Technology...

### LANGUAGE OF TEACHING

The first semester classes are taught in English. Over this period, students acquire sufficient skills in the French language to be able to follow second and subsequent semester lectures together with native speakers. Progressive immersion in the French language and culture, an educational challenge, is one of the special features of the curriculum.

### ENVIRONMENT

In the last few decades, companies have accumulated overwhelming amounts of data, be it textual (reports, emails, phone call transcripts, etc.), numeric (sales figures, meteorological data, etc.) or binary (images, audio, sensor data, etc.). Using statistical "data mining" methods, one can detect tendencies, hidden patterns and knowledge nuggets, and use them to make strategic decisions. This process is of crucial importance in all sectors of activity, and in particular for business, science, politics, security, healthcare, etc.

### COURSE AIMS

This MSc program is aimed at future experts in the design of high-performance support systems for data mining, knowledge extraction and decision aiding. This Masters program also offers a gateway to PhD studies.

### PROGRAM

This is a full-time, two-year course divided into four semesters. The 1st semester is a common core given in English in Brest. From the 2nd semester students can focus on Intelligent Decision Systems (IDS) in Brest or in Statistical Decision Engineering (SDE) in Vannes.

#### First semester (in Brest)

- > Basics of computer science
- > Mathematics & signal processing
- > Introduction to data science
- > Networking fundamentals
- > Bibliographical study
- > Intercultural workshops
- > French language (6 hours per week)

#### Second semester (IDS)

- > Software & data engineering
- > Computer science fundamentals
- > Mathematics and Information theory
- > An engineering project in working groups of 5 or 6, focused on acquiring project management experience and applying knowledge acquired in coursework
- > French language (3 hours per week)

#### Second semester (SDE)

- > Data mining and machine learning
- > Duration modelling and survival analysis
- > Decision support systems and data warehouse
- > Projects and consulting
- > French language

#### Third semester (IDS)

- > Frequentist Statistics and Probabilistic
- > Graphical Networks
- > Information systems applied to decision support
- > Knowledge engineering
- > Data, text and Web mining
- > Decision aiding
- > Project in decision support systems

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- > French language (3 hours per week)
- > During the third semester the following state-of-the-art software tools are used: SAS, RapidMiner, R, Weka, Diviz, GATE, Python NLTK, and others.

### Third semester (SDE)

- > Complex data modelling
- > Support vector machine (SVM)
- > Insurance statistics and analytical marketing
- > Deep learning and artificial intelligence
- > Geographic information systems (GIS)
- > Project in statistical decision engineering

### Fourth semester

This semester is spent carrying out a development or research project in an industrial or academic laboratory in France or abroad.

Upon completion of the four semesters, students defend their Master Thesis.

### ADMISSION REQUIREMENTS

The entry requirements include a first-class Bachelor's degree or a four-year degree in one of the academic topics offered by the Master's course. Candidates have to show an outstanding academic record for their application to be considered.

### LANGUAGE REQUIREMENTS

#### English

When applying, students must provide evidence of proficiency in the English language. This could include:

- > having English as mother tongue
- > work/studies in an English-speaking country
- > acquisition of an official English language qualification such as:
  - TOEFL: 79/120 (iBT) or 550/677 (PBT)
  - IELTS: 6/9
  - TOEIC: 750/990
  - Cambridge: CAE (Certificate of Advanced English)

#### French

Good knowledge of French is not mandatory before arrival in France, but candidates are encouraged to begin learning French in their home countries, before departure. In addition to French language courses during the academic year, a 3-week intensive French language course is organized by IMT Atlantique in August. This course is provided for all MSc students at no extra cost (except living expenses, insurance and social activities). Groups range from beginner to intermediate level.

### APPLYING

Apply at [www.imt-atlantique.fr/fr/formation/masters/masters-science](http://www.imt-atlantique.fr/fr/formation/masters/masters-science)

### COMPETENCES ACQUIRED

Thanks to IMT Atlantique and UBS expertise in postgraduate education and research, high-level competencies are acquired not only in technical/scientific fields but also in team working, written and oral communication, innovation and project management.

Last but not least, French language is also one of the competencies acquired, beneficial for working in France and other French-speaking countries or for French companies abroad.

### TYPICAL JOBS

- > Data Miner / Analyst
- > Analytics Manager
- > R&D Engineer
- > Consulting Expert
- > Decision Support System Designer • Software developer
- > Business analyst
- > Researcher and Academic.

### COST

Tuition fees for the full 2-year program:

€10,200

€5,200 (Europe and Erasmus zone) Possible partial fee waivers

### SCHOLARSHIPS

Scholarships are available depending on academic record and country of origin (companies, governments, embassies, etc.). It should be mentioned that internships are paid and cover living expenses during the last semester.

### DURATION

2 years (starting in mid-August)

### LODGING

Living expenses are quite low in Brittany compared to other locations in France, Europe or United States. The total amount does not exceed €6,000 per year (on-campus food and accommodation).

### FOLLOW IMT ATLANTIQUE ON SOCIAL NETWORKS

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