COMMUNICATION SYSTEM AND NETWORK ENGINEERING
MASTER OF SCIENCE

IMT Atlantique
Bretagne-Pays de la Loire
École Mines-Télécom

ACCREDITATION

Internationally recognized Master's Degree in Information technologies (IT) accredited by the French Ministry of Higher Education and Research.
Co-accredited with the University of Southern Brittany (Université de Bretagne Sud, UBS).

KEY WORDS

Information Technologies / Networking / Wireless Systems / Mobile Systems / Optical Communications / Digital Communications / Computer Science / Data Science / Internet

SCHOOL PROPOSING THE MASTER

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

LOCATION

Classes are given in Brest (1st year) and in Rennes (2nd year) which are 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. Both campuses are well located and include halls of residence: in Brest, in the centre of the Science Park overlooking the entrance to the Bay and in Rennes, in the centre of the Research Park.

STRONG POINTS OF THE PROGRAM

Besides being a flagship of European institutes of higher education, IMT Atlantique is 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.
Furthermore, the teaching staff consists of internationally renowned specialists in IP network technologies, mobile networks and services and network security.

INDUSTRIAL PARTNERS (COURSES AND INTERNSHIPS)

Alcatel-Lucent, Amazon, Bouygues Telecom, Completel, Mitsubishi, Orange Labs, SFR, Thales Communications...

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

Information technologies have led to the new era of communication, which in turn has rapidly changed many aspects of society, from individual behaviours to the global economy. Numerous services have become very common, such as calling and sending emails from almost everywhere, purchasing online, watching digital TV through ADSL connections or via satellite digital broadcast, travelling using GPS, etc. All of these applications necessarily rely on fixed and mobile networks that are based on sophisticated communication systems and complex network infrastructures.

COURSE AIMS

This MSc program is aimed at future experts for the design and/or administration of high-performance telecommunication networks. This requires a wide range of knowledge, including wireless, wired and optical communication systems, digital communications, network architectures, and project management of complex systems. Certain aspects of computer science are involved as well. Professionals are therefore multi-field engineers rather than narrowly focused specialists.
This Masters program also offers a gateway to PhD studies.

PROGRAM

This is a full-time, two-year course divided into four semesters:
First semester
> Networking fundamentals
> Introduction to data science
> Basics of computer science
> Mathematics & signal processing
> Bibliographical study
> Intercultural workshops
> Intensive French language courses (6 hours per week)

Second semester
> Networks: architectures, protocols, IP networks, mobile networks
> Computer science: software engineering and object-oriented programming, databases and information systems
> 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)

Third semester
> Architecture and traffic engineering principles for telecom operators' networks
> Wireless transmission systems
> Architectures and services for fixed and mobile networks
> Network planning, dimensioning and deployment strategies
> Architectures and multimedia services
> Complex project management
> Project in communication system engineering
> French language (3 hours per week)

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.

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LANGUAGE REQUIREMENTS

English
When applying, students must provide proof 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: 550/677 (Paper-based) or 79/120 (Internet-based)
  – IELTS: 6/9
  – TOEIC: 750/990
  – Cambridge: CAE (Certificate of Advanced English)

French
Knowledge of French is not mandatory before arrival in France. In addition to French language courses during the academic year, a 3-week intensive French language course is organized by Telecom Bretagne 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
http://www.imt-atlantique.fr/fr/formation/masters

COMPETENCES ACQUIRED
Thanks to IMT Atlantiques 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 skills are also one of the new competencies beneficial for working in France and other French-speaking countries, or for French companies abroad.

TYPICAL JOBS

> Telecommunications project leader
> Communication system designer
> Network architect
> R&D engineer
> Sales engineer
> Consulting expert
> 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).

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