ACCRREDITATION
Internationally recognized Master’s Degree in Science and Technology accredited by the French Ministry of Higher Education and Research.

KEY WORDS
Information Technologies / Internet of Things / Computer Networking / Convergent Networks / Wireless Networks / Mobile Networks / Internet / Network Services / Network Solution Design / Network Planning and Design

SCHOOL PROPOSING THE MASTERS PROGRAM
Telecom Bretagne, a “grande école” which is part of Institut Mines-Télécom, a leading French higher education and research force in engineering, with 12,500 students.

LOCATION
Telecom Bretagne is 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. Its 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 in telecommunications and computer science, Telecom Bretagne 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 at Telecom Bretagne 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]
Aéroport de Paris, Air France, Alcatel-Lucent, Astellia, BNP Paribas, Bouygues Télécom, Free Mobile, Mitsubishi Electric ITCE, Nij, Orange Labs / France Telecom R&D, Qualcomm, Société Générale, SFR, Technicolor, Thalès...

LANGUAGE OF INSTRUCTION
This program is taught in English and includes progressive immersion in the French language and culture.

ENVIRONMENT
The explosive growth of networks, both fixed and mobile, has led to the design, study, assessment, deployment, and administration of highly complex, distributed communication infrastructures. Powerful forces are behind these innovations: high-speed connectivity for users, great mobility (cellular networks, WiFi, LTE...) and seamless, ubiquitous access to the Internet. Network infrastructures and services, which were previously separate, are being integrated and interconnected, thus opening the way for new markets, new uses and new applications. Convergence is everywhere: the convergence of telephone, data and content-distribution networks; the convergence of infrastructure-based and ad-hoc networks, with the arrival of hybrid/mesh networks; the convergence of cellular and local wireless networks; and the convergence of services from both the fixed and mobile worlds.

COURSE AIMS
In spite of the ubiquity of the IP protocol suite, this convergence does not mean that networks will become the same through one single technology, rather that they must be highly interoperable. It is crucial for technical experts to be trained in order to guarantee the quality of the services on offer. 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 (in Brest)
• Networking fundamentals
• Transmission systems
• Basics of computer science
• Mathematics & signal processing
• Bibliographical study
• Intercultural workshops
• Intensive French language courses (6 hours per week)

Second semester (in Brest)
• Networks: telecommunication networks, 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 (in Rennes)
• Fundamentals of convergent networks
• Networks, quality of service and multimedia
• Mobile networks and network convergence
• Services for communication networks
• New network architectures
• Networking research seminar
• Project: During this semester, students also work on a short project. This project, which can be either done individually or in pairs, may take different forms: software development; a bibliographical study of a research subject; participation in the design, setup or assessment of research testbeds, etc.... For this project, students will work either with an industrial partner or with a research team from the Networks, Security & Multimedia department at Telecom Bretagne
• French language courses (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.
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**
- Network solution designer
- Network planner and designer
- Network architect
- Network project leader
- Network integration leader
- R&D engineer
- Consulting expert
- Researcher and Academic

**COST**
Tuition and fees for the full 2-year program:
- €10,000
- €5,000 (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.

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**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).