

# MASTER'S DEGREE IN ADVANCED TELECOMMUNICATIONS TECHNOLOGIES

Barcelona School of  
Telecommunications Engineering

Castelldefels School of  
Telecommunications and Aerospace  
Engineering



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH



# MASTER’S DEGREE IN ADVANCED TELECOMMUNICATIONS TECHNOLOGIES

The master’s degree in Advanced Telecommunications Technologies (MATT) is a joint project of the Barcelona School of Telecommunications Engineering (ETSETB) and the Castelldefels School of Telecommunications and Aerospace Engineering (EETAC). As a student on this master’s degree you may choose one of the concentrations proposed by the schools (technical and technological specialisation at the ETSETB or cross-disciplinary courses at the EETAC) or build your own specific profile by selecting the optional subjects you are interested in at each school, as well as by combining courses from both schools.

As a graduate of the master’s degree you will be capable of selecting and using a variety of machine learning techniques and building systems that use such techniques for decision making, as well as analysing software-managed complex systems and designing and building applications and services based on object-oriented software. You will also be capable of integrating telecommunications engineering technologies and systems of a general nature in broader, more multidisciplinary contexts, such as automobiles and mobility, bioengineering, telemedicine and smart cities.

## Curriculum

This information may be subject to change.  
Up-to-date information is available at [upc.edu](http://upc.edu)

60 ECTS  
credits

Entrepreneurship for World Challenges	5
Software Architecture	5
Machine Learning from Data	5
Optional subjects / Seminars	33
Master’s Thesis	12

Compulsory subjects

Optional subjects and/or seminars in various ICT areas or pathways

1st

Spanish university and  
46th in the world in  
Telecommunication  
Engineering

Source: QS World University Rankings  
by Subject 2021

36

laboratories  
for practicals

93%

UPC graduate  
employment rate

Source: Graduate employment survey of master’s  
degree graduates of Catalan universities by the  
Catalan University Quality Assurance Agency  
(AQU Catalunya) 2020.

### Admission

Holders of a degree or students in the last year of a degree can apply for admission to the master’s degree in Advanced Telecommunications Technologies. An official degree certificate is necessary on the day of enrolment, in September. The master’s degree starts in September and, if there are places available, in February. Direct admission is considered for candidates with:

- Bachelor’s degree in Telecommunications Science and Technology.
- Bachelor’s degrees that qualify the holder to practise as a technical telecommunications engineer: bachelor’s degrees in Audiovisual Systems Engineering, Electronic Systems Engineering, Telecommunications Systems Engineering and Network Engineering.
- Degree in Telecommunications Engineering.

In all cases, depending on their background, applicants may be admitted with bridging courses.

### Structure

The master’s degree in Advanced Telecommunications Technologies is

worth 60 ECTS credits and is taught over one academic year, in the mornings and afternoons, face-to-face. It is taught entirely in English and can be taken full-time or part-time. The master’s degree is designed in such a way that it can be adapted to the needs of students, who have a great deal of flexibility when it comes to choosing courses. Students can take all the subjects over two semesters at the UPC and carry out the master’s thesis at another university in the third semester. They can also take a research pathway and later a doctoral degree.

### Pathways

Optional subjects are grouped into pathways that allow students to concentrate on a particular area within ICT. Students who pass 25 ECTS credits for subjects and take one of these pathways receive a certificate stating that they have taken this specialisation. The master’s degree can be taken without following a pathway. In this case, students take 33 ECTS credits in an unrestricted choice of optional subjects. No specialisation certificate is awarded (just the official degree certificate). Students can also take seminars, which

are optional subjects worth 3 ECTS credits that are taught in an intensive format once the examination period at the end of each semester has ended.

### Professional opportunities

The master’s degree in Advanced Telecommunications Technologies is associated with a field in which demand for labour is high. Designing, managing and executing projects in the field of telecommunications engineering are some of the key competencies that the master’s degree equips students with. The projects may be related to:

- Artificial intelligence systems based on structured data and unstructured data.
- Security in communication networks: cryptography, user authentication, digital signatures.
- Electronic circuits and components: microprocessors, devices (routers, switches, etc.), sensors, actuators, transducers.
- Radio, fibre-optic and copper-cable communications systems.

## Pathways

### Cross-disciplinary pathways

5G Networks
Internet of Things

### Communications

Antennas, Microwaves and Photonics for Communications and Earth Observation
Wireless Communications
Optical Networks

EETAC Pathways

ETSETB Pathways

### Networks and Communication Protocols

Network Engineering
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### Multimedia

Deep Learning for Multimedia Processing
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### Electronics

Integrated Systems
Instrumentation and Sensors
Micro- and Nanotechnologies for Energy Management

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This master's degree is a joint project of the Barcelona School of Telecommunications Engineering (ETSETB) and the Castelldefels School of Telecommunications and Aerospace Engineering (EETAC). Both are globalised, renowned schools with wide-ranging research activity and close ties to industry.

The ETSETB and the EETAC are schools of the Universitat Politècnica de Catalunya · BarcelonaTech (UPC), a benchmark public institution of research and higher education in the fields of engineering, architecture, science and technology. With 50 years of history and more than 30,000 students, the UPC has the greatest concentration of research and innovation in IT in southern Europe. It is the best Spanish university in Computer Science, Engineering and Technology, according to the 2021 QS World University Rankings by Subject.

## Telecommunications, engineering for the 21st century

Further information:

[matt.masters.upc.edu](mailto:matt.masters.upc.edu)

[eetac.upc.edu](mailto:eetac.upc.edu)

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