Bachelor's degree in Telecommunications Technologies and Services Engineering

The bachelor's degree in **Telecommunications Technologies and Services Engineering** provides a solid grounding in the fundamentals of ICT engineering and the specific skills pertaining to each of the majors that are offered. It produces versatile professionals who are able to change work environments and meet the sector's future challenges and those that will occur in industrial sectors that employ these technologies. The degree also ensures concentrated learning in the following majors: Audiovisual Systems, Telecommunications Systems and Network Systems.

Given that ICTs are crucial in any industrial, research and innovation sector, graduates' professional opportunities are wide-ranging: they will be able to accomplish a broad range of technical and management tasks and start new entrepreneurial projects in this technological field.

Communications are ever more necessary in all environments and scenarios and specialists are highly sought after in fibre optics, mobile communications—to serve the fourth generation and develop the foundations of the fifth—and GPS technologies and services, for example. Other examples are projects involving cities whose intelligence increases as networks of sensors such as cameras and pollution sensors are implemented to improve the lives of citizens, and the extensive use of communication networks and the so-called Internet of Things, which demand that the privacy and security of our data be protected. The audiovisual sector also requires highly skilled professionals to design advanced systems for 3D sound and image technologies, for example, and not just for direct consumers of media such as music shows or the cinema but also for important sectors such as health and the automotive and transport industries, in which there is a clear need for developing electronic devices and instruments that provide accurate and reliable data such as those that are needed to monitor patients' progress. Another area that is emerging forcefully is the design of new solar cells and photovoltaic systems in the energy sector.

Major in Audiovisual Systems
You will acquire the knowledge to conceive, design, implement and operate products, systems and services in the field of audiovisual systems engineering, including the fields of acoustics, image, audio, video and multimedia environments.

Major in Telecommunications Systems
You will acquire the knowledge to conceive, design, implement and operate telecommunications systems based on generating, transmitting, receiving and processing electrical, acoustic and optical signals across the frequency spectrum and processing related information.

Major in Network Systems
You will acquire the knowledge to conceive, design, implement and operate telematic networks, their security mechanisms and the data that are transmitted through them; the protocols that allow them to function; and the distributed and centralised services and applications that they offer.

This bachelor's degree is taught at Barcelona School of Telecommunications Engineering

Majors

- Audiovisual Systems
- Telecommunications Systems
- Network Systems

GENERAL DETAILS

Duration
4 years

Study load
240 ECTS credits (including the bachelor's thesis). One credit is equivalent to a study load of 25-30 hours.

Delivery

Face-to-face

Fees and grants

Approximate fees per academic year: €2,551 (€3,826 for non-EU residents). Consult the public fees system based on income (grants and payment options).

Official degree

Recorded in the Ministry of Education's degree register

ADMISSION

Places

220

Registration and enrolment

What are the requirements to enrol in a bachelor's degree course?

Legalisation of foreign documents

All documents issued in non-EU countries must be legalised and bear the corresponding apostille.

DOUBLE-DEGREE AGREEMENTS

Within the framework of the courses offered by the Interdisciplinary Higher Education Centre (CFIS)

You can also take an interdisciplinary double degree coordinated by the CFIS at two UPC schools.
Further information on the CFIS website

PROFESSIONAL OPPORTUNITIES

Professional opportunities

- Leadership positions.
- Business and entrepreneurship.
- Management and administration.
- Management of an area or department.
- Project management.
- Technological advice and consulting in ICT solutions for any area of industry or research.
- Design and implementation of telecommunications, telematic, audiovisual and electronic systems and applications.
- Administration and implementation of telecommunications, telematic, audiovisual and electronic systems.
- Development and programming of telecommunications, telematic, audiovisual and electronic applications.
- Research, innovation and product design in ICTs or any field that requires ICT solutions.
- Training.
- Marketing and logistics.

ORGANISATION

Academic calendar

General academic calendar for bachelor’s, master’s and doctoral degrees courses

Academic regulations

Academic regulations for bachelor’s degree courses at the UPC

Language certification and credit recognition

Queries about language courses and certification

Barcelona School of Telecommunications Engineering (ETSETB)

CURRICULUM

CURRICULUM

The studies are structured annually in two four-month periods. There are a fall semester (September - January) and a spring semester (February - June).

The curriculum of the degree has a common part that encompasses the **education in basic engineering** and **fundamentals of the different specialties** . This common part extends from the first quarter (Q1A) to the fifth quarter (Q3A).
Subsequently, from the sixth four-month period (Q3B) to the eighth four-month period (Q4B), the training in the specialty chosen by the student is developed.
The chart below details the **common training** , showing the basic subjects (in yellow in the diagram) and compulsory subjects (in grey in the diagram). To see in detail the formation of each specialty, you can go to:

- **Audiovisual Systems**
- **Electronic systems (specialty in extinction)**
- **Telecommunications Systems**
- **Telematics Systems**

You can consult the tables of prerequisites, corequisites and pre-corequisites in the following links:

- Common block table
- Table of mention blocks
- Table of optional requirements

The Curriculum of the Degree in Telecommunications Technologies and Services Engineering consists of 240 ECTS, separated in subjects as follows:

Modules	Credits
Basic formation	**60**
Compulsory training	**96**
Mention elective training	**48**
Common elective training	**18**
Final degree project	**18**
Total Credits	**240**

Basic formation
The basic training module consists of 60 credits divided between Mathematics, Computer Science, Physics, Electronics and Business; with 24, 12, 11, 7 and 6 ECTS respectively.
This module will be taken in the first half of the curriculum, i.e. in the first three semesters of the degree (1A, 1B and 2A). In addition, these credits will be distributed in subjects mainly of 6 credits each one.

Basic training module	Credits
Mathematics	24
Computer Science	12
Physics	11
Electronics	7
Business	6

COURSE GUIDE:

Subjects	ECTS credits	Type
FIRST SEMESTER		
3D with Kinect, Hands-On-Seminar	2	Optional
A Practical Introduction to Matlab	2	Optional
Administrating Linux Systems	2	Optional

Subjects	ECTS credits	Type
Calculus	6	Compulsory
Circuit Simulation and Analysis Using PSpice	2	Optional
Cognitive Radio	2	Optional
Cooperation Project with Wifi Technologies	2	Optional
Create Your Future: Just a Job or Your True Passion	2	Optional
Ethics in Ict	2	Optional
Financial Engineering for Economic Planning of Investments	2	Optional
Fundamentals of Computers	6	Compulsory
Fundamentals of Electronics	7	Compulsory
Fundamentals of Physics	5	Compulsory
History of Computing	2	Optional
Ictd. Technology for Sustainable Development	2	Optional
Introduction to Mathematics	2	Optional
Linear Algebra	6	Compulsory
Linear Algebra, Linear Codes and Secret-Sharing Schemes	2	Optional
Low Cost Measurement Systems	2	Optional
Pigment Identification with Raman Spectroscopy	2	Optional
Renewable Energy	2	Optional
Statistical Tools for Social Networks and the Www	2	Optional
Telecommunication History	2	Optional
Telecomunications Market. Ict Hypersector	2	Optional

Subjects		ECTS credits	Type
Major in Audiovisuals Systems	3D with Kinect, Hands-On-Seminar	2	Optional
	A Practical Introduction to Matlab	2	Optional
	Administrating Linux Systems	2	Optional
	Calculus	6	Compulsory
	Circuit Simulation and Analysis Using PSpice	2	Optional
	Cognitive Radio	2	Optional
	Cooperation Project with Wifi Technologies	2	Optional
	Create Your Future: Just a Job or Your True Passion	2	Optional
	Ethics in Ict	2	Optional
	Financial Engineering for Economic Planning of Investments	2	Optional
	Fundamentals of Computers	6	Compulsory
	Fundamentals of Electronics	7	Compulsory
	Fundamentals of Physics	5	Compulsory
	History of Computing	2	Optional
	Ictd. Technology for Sustainable Development	2	Optional
	Introduction to Mathematics	2	Optional
	Linear Algebra	6	Compulsory
	Linear Algebra, Linear Codes and Secret-Sharing Schemes	2	Optional
	Low Cost Measurement Systems	2	Optional
	Pigment Identification with Raman Spectroscopy	2	Optional
	Renewable Energy	2	Optional
	Statistical Tools for Social Networks and the Www	2	Optional
	Telecommunication History	2	Optional
	Telecomunications Market. Ict Hypersector	2	Optional

Subjects		ECTS credits	Type
Major in Electronics Systems	3D with Kinect, Hands-On-Seminar	2	Optional
	A Practical Introduction to Matlab	2	Optional
	Administrating Linux Systems	2	Optional
	Calculus	6	Compulsory
	Circuit Simulation and Analysis Using PSpice	2	Optional
	Cognitive Radio	2	Optional
	Cooperation Project with Wifi Technologies	2	Optional
	Create Your Future: Just a Job or Your True Passion	2	Optional
	Ethics in Ict	2	Optional
	Financial Engineering for Economic Planning of Investments	2	Optional
	Fundamentals of Computers	6	Compulsory
	Fundamentals of Electronics	7	Compulsory
	Fundamentals of Physics	5	Compulsory
	History of Computing	2	Optional
	Ictd. Technology for Sustainable Development	2	Optional
	Introduction to Mathematics	2	Optional
	Linear Algebra	6	Compulsory
	Linear Algebra, Linear Codes and Secret-Sharing Schemes	2	Optional
	Low Cost Measurement Systems	2	Optional
	Pigment Identification with Raman Spectroscopy	2	Optional
	Renewable Energy	2	Optional
	Statistical Tools for Social Networks and the Www	2	Optional
	Telecommunication History	2	Optional
	Telecomunications Market. Ict Hypersector	2	Optional

Subjects		ECTS credits	Type
Major in Network Engineering	3D with Kinect, Hands-On-Seminar	2	Optional
	A Practical Introduction to Matlab	2	Optional
	Administrating Linux Systems	2	Optional
	Calculus	6	Compulsory
	Circuit Simulation and Analysis Using PSpice	2	Optional
	Cognitive Radio	2	Optional
	Cooperation Project with Wifi Technologies	2	Optional
	Create Your Future: Just a Job or Your True Passion	2	Optional
	Ethics in Ict	2	Optional
	Financial Engineering for Economic Planning of Investments	2	Optional
	Fundamentals of Computers	6	Compulsory
	Fundamentals of Electronics	7	Compulsory
	Fundamentals of Physics	5	Compulsory
	History of Computing	2	Optional
	Ictd. Technology for Sustainable Development	2	Optional
	Introduction to Mathematics	2	Optional
	Linear Algebra	6	Compulsory
	Linear Algebra, Linear Codes and Secret-Sharing Schemes	2	Optional
	Low Cost Measurement Systems	2	Optional
	Pigment Identification with Raman Spectroscopy	2	Optional
	Renewable Energy	2	Optional
	Statistical Tools for Social Networks and the Www	2	Optional
	Telecommunication History	2	Optional
	Telecomunications Market. Ict Hypersector	2	Optional

Subjects		ECTS credits	Type
Major in Telecomunications Systems	3D with Kinect, Hands-On-Seminar	2	Optional
	A Practical Introduction to Matlab	2	Optional
	Administrating Linux Systems	2	Optional
	Calculus	6	Compulsory
	Circuit Simulation and Analysis Using PSpice	2	Optional
	Cognitive Radio	2	Optional
	Cooperation Project with Wifi Technologies	2	Optional
	Create Your Future: Just a Job or Your True Passion	2	Optional
	Ethics in Ict	2	Optional
	Financial Engineering for Economic Planning of Investments	2	Optional
	Fundamentals of Computers	6	Compulsory
	Fundamentals of Electronics	7	Compulsory
	Fundamentals of Physics	5	Compulsory
	History of Computing	2	Optional
	Ictd. Technology for Sustainable Development	2	Optional
	Introduction to Mathematics	2	Optional
	Linear Algebra	6	Compulsory
	Linear Algebra, Linear Codes and Secret-Sharing Schemes	2	Optional
	Low Cost Measurement Systems	2	Optional
	Pigment Identification with Raman Spectroscopy	2	Optional
	Renewable Energy	2	Optional
	Statistical Tools for Social Networks and the Www	2	Optional
	Telecommunication History	2	Optional
	Telecomunications Market. Ict Hypersector	2	Optional
SECOND SEMESTER			
Introduction to Networks		6	Compulsory
Linear Circuits and Systems		6	Compulsory
Mathematics for Telecommunications		6	Compulsory
Object Oriented Programming		6	Compulsory
Vector Calculus		6	Compulsory
Major in Audiovisuals Systems	Introduction to Networks	6	Compulsory
	Linear Circuits and Systems	6	Compulsory
	Mathematics for Telecommunications	6	Compulsory
	Object Oriented Programming	6	Compulsory
	Vector Calculus	6	Compulsory

Subjects		ECTS credits	Type
Major in Electronics Systems	Introduction to Networks	6	Compulsory
	Linear Circuits and Systems	6	Compulsory
	Mathematics for Telecommunications	6	Compulsory
	Object Oriented Programming	6	Compulsory
	Vector Calculus	6	Compulsory
Major in Network Engineering	Introduction to Networks	6	Compulsory
	Linear Circuits and Systems	6	Compulsory
	Mathematics for Telecommunications	6	Compulsory
	Object Oriented Programming	6	Compulsory
	Vector Calculus	6	Compulsory
Major in Telecomunications Systems	Introduction to Networks	6	Compulsory
	Linear Circuits and Systems	6	Compulsory
	Mathematics for Telecommunications	6	Compulsory
	Object Oriented Programming	6	Compulsory
	Vector Calculus	6	Compulsory
THIRD SEMESTER			
Digital Design		6	Compulsory
Electromagnetism		6	Compulsory
Introduction to Ict Engineering		6	Compulsory
Learning with Python		2	Optional
Probability and Statistics		6	Compulsory
Signals and Systems		6	Compulsory
Major in Audiovisuals Systems	Digital Design	6	Compulsory
	Electromagnetism	6	Compulsory
	Introduction to Ict Engineering	6	Compulsory
	Learning with Python	2	Optional
	Probability and Statistics	6	Compulsory
	Signals and Systems	6	Compulsory
Major in Electronics Systems	Digital Design	6	Compulsory
	Electromagnetism	6	Compulsory
	Introduction to Ict Engineering	6	Compulsory
	Learning with Python	2	Optional
	Probability and Statistics	6	Compulsory
	Signals and Systems	6	Compulsory

Subjects		ECTS credits	Type
Major in Network Engineering	Digital Design	6	Compulsory
	Electromagnetism	6	Compulsory
	Introduction to Ict Engineering	6	Compulsory
	Learning with Python	2	Optional
	Probability and Statistics	6	Compulsory
	Signals and Systems	6	Compulsory
Major in Telecomunications Systems	Digital Design	6	Compulsory
	Electromagnetism	6	Compulsory
	Introduction to Ict Engineering	6	Compulsory
	Learning with Python	2	Optional
	Probability and Statistics	6	Compulsory
	Signals and Systems	6	Compulsory
FOURTH SEMESTER			
Electromagnetics Waves		6	Compulsory
Electronic Functions and Systems		6	Compulsory
Introduction to Audiovisual Processing		6	Compulsory
Introduction to Communications		6	Compulsory
Machine Learning Through Reinforcement		2	Optional
Network Applications and Services		6	Compulsory
Major in Audiovisuals Systems	Electromagnetics Waves	6	Compulsory
	Electronic Functions and Systems	6	Compulsory
	Introduction to Audiovisual Processing	6	Compulsory
	Introduction to Communications	6	Compulsory
	Machine Learning Through Reinforcement	2	Optional
	Network Applications and Services	6	Compulsory
Major in Electronics Systems	Electromagnetics Waves	6	Compulsory
	Electronic Functions and Systems	6	Compulsory
	Introduction to Audiovisual Processing	6	Compulsory
	Introduction to Communications	6	Compulsory
	Machine Learning Through Reinforcement	2	Optional
	Network Applications and Services	6	Compulsory
Major in Network Engineering	Electromagnetics Waves	6	Compulsory
	Electronic Functions and Systems	6	Compulsory
	Introduction to Audiovisual Processing	6	Compulsory
	Introduction to Communications	6	Compulsory
	Machine Learning Through Reinforcement	2	Optional
	Network Applications and Services	6	Compulsory

Subjects		ECTS credits	Type
Major in Telecomunications Systems	Electromagnetics Waves	6	Compulsory
	Electronic Functions and Systems	6	Compulsory
	Introduction to Audiovisual Processing	6	Compulsory
	Introduction to Communications	6	Compulsory
	Machine Learning Through Reinforcement	2	Optional
	Network Applications and Services	6	Compulsory
FIFTH SEMESTER			
Basic Engineering Project		6	Compulsory
Data Transmission		6	Compulsory
High-Frequency Circuits		4.5	Optional
Implementation of a Small Social Network in the Cloud		2	Optional
Introduction to Deep Learning		2	Optional
Introduction to Deep Learning for Computer Vision		2	Optional
Music Signal Processing		2	Optional
Radiation and Propagation		6	Compulsory
Signal Processing for Communications and Audiovisual Systems		6	Compulsory
Systems Based on Microprocessors Design		6	Compulsory
Major in Audiovisuals Systems	Basic Engineering Project	6	Compulsory
	Data Transmission	6	Compulsory
	High-Frequency Circuits	4.5	Optional
	Implementation of a Small Social Network in the Cloud	2	Optional
	Introduction to Deep Learning	2	Optional
	Introduction to Deep Learning for Computer Vision	2	Optional
	Music Signal Processing	2	Optional
	Radiation and Propagation	6	Compulsory
	Signal Processing for Communications and Audiovisual Systems	6	Compulsory
	Systems Based on Microprocessors Design	6	Compulsory
Major in Electronics Systems	Basic Engineering Project	6	Compulsory
	Data Transmission	6	Compulsory
	High-Frequency Circuits	4.5	Optional
	Implementation of a Small Social Network in the Cloud	2	Optional
	Introduction to Deep Learning	2	Optional
	Introduction to Deep Learning for Computer Vision	2	Optional
	Music Signal Processing	2	Optional
	Radiation and Propagation	6	Compulsory
	Signal Processing for Communications and Audiovisual Systems	6	Compulsory
	Systems Based on Microprocessors Design	6	Compulsory

Subjects		ECTS credits	Type
Major in Network Engineering	Basic Engineering Project	6	Compulsory
	Data Transmission	6	Compulsory
	High-Frequency Circuits	4.5	Optional
	Implementation of a Small Social Network in the Cloud	2	Optional
	Introduction to Deep Learning	2	Optional
	Introduction to Deep Learning for Computer Vision	2	Optional
	Music Signal Processing	2	Optional
	Radiation and Propagation	6	Compulsory
	Signal Processing for Communications and Audiovisual Systems	6	Compulsory
	Systems Based on Microprocessors Design	6	Compulsory
Major in Telecomunications Systems	Basic Engineering Project	6	Compulsory
	Data Transmission	6	Compulsory
	High-Frequency Circuits	4.5	Optional
	Implementation of a Small Social Network in the Cloud	2	Optional
	Introduction to Deep Learning	2	Optional
	Introduction to Deep Learning for Computer Vision	2	Optional
	Music Signal Processing	2	Optional
	Radiation and Propagation	6	Compulsory
	Signal Processing for Communications and Audiovisual Systems	6	Compulsory
	Systems Based on Microprocessors Design	6	Compulsory
SIXTH SEMESTER			
Astronomy & Radioastronomy		6	Optional
Biometric Technologies		6	Optional
Description and Retrieval of Audiovisual Content		6	Optional
Economics and Management		6	Compulsory
Financial Topics for Entrepreneurship		6	Optional
Information Security and Coding		6	Optional
Internet Management		6	Optional
Lasers		6	Optional
Marketing, Technology and Management Skills		6	Optional
Matlab and Its Applications in Engineering		6	Optional
Network Simulation		6	Optional
Networks and Services Management		6	Optional
Optoelectronic Devices and 3D Vision		6	Optional
Pattern Classification: Applications in Signal Processing		6	Optional
Planning Communications Networks		6	Optional
Programming for Multimedia Applications		6	Optional
Quality of Service Engineering in IP Networks		6	Optional

Subjects		ECTS credits	Type
Quantum Physics		6	Optional
Regulation, Economy and Telecommunication Policy		6	Optional
Statistics		6	Optional
Technical Writing		6	Optional
Technology and Culture		6	Optional
Television Systems		6	Optional
Wireless Networks		6	Optional
Major in Audiovisuals Systems	Acoustics and Electroacoustics	6	Compulsory
	Audio and Speech Processing	6	Compulsory
	Image and Video Processing	6	Compulsory
	Multimedia Communications	6	Compulsory
	Astronomy & Radioastronomy	6	Optional
	Biometric Technologies	6	Optional
	Description and Retrieval of Audiovisual Content	6	Optional
	Economics and Management	6	Compulsory
	Financial Topics for Entrepreneurship	6	Optional
	Information Security and Coding	6	Optional
	Internet Management	6	Optional
	Lasers	6	Optional
	Marketing, Technology and Management Skills	6	Optional
	Matlab and Its Applications in Engineering	6	Optional
	Network Simulation	6	Optional
	Networks and Services Management	6	Optional
	Optoelectronic Devices and 3D Vision	6	Optional
	Pattern Classification: Applications in Signal Processing	6	Optional
	Planning Communications Networks	6	Optional
	Programming for Multimedia Applications	6	Optional
	Quality of Service Engineering in IP Networks	6	Optional
	Quantum Physics	6	Optional
	Regulation, Economy and Telecommunication Policy	6	Optional
	Statistics	6	Optional
	Technical Writing	6	Optional
	Technology and Culture	6	Optional
	Television Systems	6	Optional
	Wireless Networks	6	Optional

Subjects		ECTS credits	Type
Major in Electronics Systems	Automobile Electronics	6	Optional
	Compliance of Electronic Products	6	Optional
	Design of Digital Electronic Systems	5	Compulsory
	Digital Systems Using Embedded Linux	6	Optional
	Fundamentals of Micro- and Nanotechnologies	6	Compulsory
	High Frequency Circuits	6	Optional
	Instrumentation and Measurement Systems	6	Compulsory
	Introduction to Photovoltaic Solar Energy	6	Optional
	Power Electronics and Control Systems	7	Compulsory
	Real-Time Dsp System Design with Fpga	6	Optional
	Remote Control Systems	6	Optional
	Sensors, Actuators and Microcontrollers in Mobile Robots	6	Optional
	Smart Electronics	6	Optional
	Astronomy & Radioastronomy	6	Optional
	Biometric Technologies	6	Optional
	Description and Retrieval of Audiovisual Content	6	Optional
	Economics and Management	6	Compulsory
	Financial Topics for Entrepreneurship	6	Optional
	Information Security and Coding	6	Optional
	Internet Management	6	Optional
	Lasers	6	Optional
	Marketing, Technology and Management Skills	6	Optional
	Matlab and Its Applications in Engineering	6	Optional
	Network Simulation	6	Optional
	Networks and Services Management	6	Optional
	Optoelectronic Devices and 3D Vision	6	Optional
	Pattern Classification: Applications in Signal Processing	6	Optional
	Planning Communications Networks	6	Optional
	Programming for Multimedia Applications	6	Optional
	Quality of Service Engineering in IP Networks	6	Optional
	Quantum Physics	6	Optional
	Regulation, Economy and Telecommunication Policy	6	Optional
	Statistics	6	Optional
	Technical Writing	6	Optional
	Technology and Culture	6	Optional
	Television Systems	6	Optional
	Wireless Networks	6	Optional

Subjects		ECTS credits	Type
Major in Network Engineering	Internet Transport, Control and Management	6	Compulsory
	Network Analysis and Evaluation	6	Compulsory
	Network Infrastructure	6	Compulsory
	Software for Distributed Applications	6	Compulsory
	Astronomy & Radioastronomy	6	Optional
	Biometric Technologies	6	Optional
	Description and Retrieval of Audiovisual Content	6	Optional
	Economics and Management	6	Compulsory
	Financial Topics for Entrepreneurship	6	Optional
	Information Security and Coding	6	Optional
	Internet Management	6	Optional
	Lasers	6	Optional
	Marketing, Technology and Management Skills	6	Optional
	Matlab and Its Applications in Engineering	6	Optional
	Network Simulation	6	Optional
	Networks and Services Management	6	Optional
	Optoelectronic Devices and 3D Vision	6	Optional
	Pattern Classification: Applications in Signal Processing	6	Optional
	Planning Communications Networks	6	Optional
	Programming for Multimedia Applications	6	Optional
	Quality of Service Engineering in IP Networks	6	Optional
	Quantum Physics	6	Optional
	Regulation, Economy and Telecommunication Policy	6	Optional
	Statistics	6	Optional
	Technical Writing	6	Optional
	Technology and Culture	6	Optional
	Television Systems	6	Optional
	Wireless Networks	6	Optional

Subjects		ECTS credits	Type
Major in Telecomunications Systems	Advanced Digital Communications	6	Compulsory
	Antennas	6	Compulsory
	Microwaves	6	Compulsory
	Mobile Communications Laboratory	6	Optional
	Optical Communications	6	Compulsory
	Optical-Fiber Telecommunication Systems for Internet (IP Over Wdm)	6	Optional
	Radar	6	Optional
	Radio Systems and Devices	6	Optional
	Real-Time Digital Signal Processing	6	Optional
	Remote Sensing and Earth Observation Systems	6	Optional
	Space Telecommunications	6	Optional
	Astronomy & Radioastronomy	6	Optional
	Biometric Technologies	6	Optional
	Description and Retrieval of Audiovisual Content	6	Optional
	Economics and Management	6	Compulsory
	Financial Topics for Entrepreneurship	6	Optional
	Information Security and Coding	6	Optional
	Internet Management	6	Optional
	Lasers	6	Optional
	Marketing, Technology and Management Skills	6	Optional
	Matlab and Its Applications in Engineering	6	Optional
	Network Simulation	6	Optional
	Networks and Services Management	6	Optional
	Optoelectronic Devices and 3D Vision	6	Optional
	Pattern Classification: Applications in Signal Processing	6	Optional
	Planning Communications Networks	6	Optional
	Programming for Multimedia Applications	6	Optional
	Quality of Service Engineering in IP Networks	6	Optional
	Quantum Physics	6	Optional
	Regulation, Economy and Telecommunication Policy	6	Optional
	Statistics	6	Optional
	Technical Writing	6	Optional
	Technology and Culture	6	Optional
	Television Systems	6	Optional
	Wireless Networks	6	Optional
SEVENTH SEMESTER			
Acoustics and Electroacoustics II		6	Optional
Big Data and R Programming		6	Optional

Subjects		ECTS credits	Type
Business Analytics and Business Intelligence		6	Optional
Challenge Based Innovation		6	Optional
Communications Software		6	Optional
ICT Entrepreneurship Project		6	Optional
Major in Audiovisuals Systems	Advanced Project in Audiovisual Systems Engineering	12	Compulsory
	Audiovisual Coding	6	Compulsory
	Audiovisual Technology and Production	6	Compulsory
	Acoustics and Electroacoustics II	6	Optional
	Big Data and R Programming	6	Optional
	Business Analytics and Business Intelligence	6	Optional
	Challenge Based Innovation	6	Optional
	Communications Software	6	Optional
	ICT Entrepreneurship Project	6	Optional
Major in Electronics Systems	Advanced Project in Electronic Systems Engineering	12	Compulsory
	Communication Electronics	6	Compulsory
	Acoustics and Electroacoustics II	6	Optional
	Big Data and R Programming	6	Optional
	Business Analytics and Business Intelligence	6	Optional
	Challenge Based Innovation	6	Optional
	Communications Software	6	Optional
	ICT Entrepreneurship Project	6	Optional
Major in Network Engineering	Advanced Project in Network Systems Engineering	12	Compulsory
	Network Application Design	6	Compulsory
	Support Systems for Mobile Communications	6	Compulsory
	Acoustics and Electroacoustics II	6	Optional
	Big Data and R Programming	6	Optional
	Business Analytics and Business Intelligence	6	Optional
	Challenge Based Innovation	6	Optional
	Communications Software	6	Optional
	ICT Entrepreneurship Project	6	Optional

Subjects		ECTS credits	Type
Major in Telecomunications Systems	Advanced Project in Telecommunication Systems Engineering	12	Compulsory
	Design of Radio Emitters and Receivers	6	Optional
	Radio Communications	6	Compulsory
	Acoustics and Electroacoustics II	6	Optional
	Big Data and R Programming	6	Optional
	Business Analytics and Business Intelligence	6	Optional
	Challenge Based Innovation	6	Optional
	Communications Software	6	Optional
	ICT Entrepreneurship Project	6	Optional
EIGHTH SEMESTER			
(Ang) Pràctiques Externes		0	Optional
Bachelor's Thesis		18	Project
Major in Audiovisuals Systems	(Ang) Pràctiques Externes	0	Optional
	Bachelor's Thesis	18	Project
Major in Electronics Systems	(Ang) Pràctiques Externes	0	Optional
	Bachelor's Thesis	18	Project
Major in Network Engineering	(Ang) Pràctiques Externes	0	Optional
	Bachelor's Thesis	18	Project
Major in Telecomunications Systems	(Ang) Pràctiques Externes	0	Optional
	Bachelor's Thesis	18	Project