

Master's degree in Telecommunications Engineering (MET)

The **master's degree in Telecommunications Engineering** ([master's degree website](#)) is a training proposal that is adaptable to the needs of two types of students: those who wish to focus on a professional career and those who wish to pursue a doctoral degree in the area of telecommunications engineering.

This master's degree provides graduates with a broad profile that includes skills and expertise in communications systems, networks, electronics and audiovisual systems to ensure that they have the professional competencies that they need to practise as telecommunications engineers. After the first, compulsory subject area, students can choose from a wide variety of subjects to acquire a general profile, specialise in a field, or engage in research and pursue a doctoral degree.

The aim is for the graduates to enter modern industry as benchmark professionals in the new multidisciplinary work and production scenario. To increase their employability, students can take both the master's thesis and some of the ECTS credits for optional subjects in a company or laboratory.

MET has a strong international character. It is taught entirely in English as it is expected that a large number of students will be from other countries. There is also the possibility of obtaining a joint degree with another internationally renowned university.

Specialisations

- [Antennas, Microwaves and Photonics for Communications and Earth Observation](#)
- [Electronics](#)
- [Fibre Optic Communications](#)
- [Internet Networks and Technologies](#)
- [Multimedia](#)
- [Wireless Communications](#)

GENERAL DETAILS

Duration and start date

Two academic years, 120 ECTS credits. Starting September and February

Timetable and delivery

Mornings and afternoons. Face-to-face

Fees and grants

Approximate fees for the master's degree, **excluding other costs** (does not include non-teaching academic fees and issuing of the degree certificate):

€2,215 (€12,662 for non-EU residents).

Grants for the degree

- **Everis:** 2 scholarships with a grant of €3,000 each, and carrying out practices in Everis during a semester..
- **Fòrum TIC:** 1 scholarship of €3,000.
- **HP:** 1 scholarship with a grant of €2,773.35 and an additional employment contract linked to the duration of the scholarship .
- **Telecogresca:** 1 scholarship for the 1st.

[More information about own scholarships](#)

[More information about fees and payment options](#)

[More information about grants and loans](#)

Language of instruction

English

Location

[Barcelona School of Telecommunications Engineering](#)

Official degree

[Recorded in the Ministry of Education's degree register](#)

ADMISSION

General requirements

[Academic requirements for admission to master's degrees](#)

Specific requirements

- Bachelor's degree in Telecommunications Technologies and Services Engineering
- Bachelor's degree in Telecommunications Science and Technology
- Bachelor's degree in Audiovisual Systems Engineering
- Bachelor's degree in Electronic Systems Engineering
- Bachelor's degree in Telecommunications Systems Engineering
- Bachelor's degree in Network Engineering.
- Bachelor's degree in Electrical Engineering.
- Pre-EHEA five-year degree in Telecommunications Engineering: 60 ECTS credits may be recognised if the degree is homologated in Spain.
- Pre-EHEA five-year degree in Electronic Engineering: 45 ECTS credits may be recognised if the degree is homologated in Spain.
- Pre-EHEA diploma in Telecommunications Engineering: an additional 30 ECTS credits must be passed.
- Bachelor's degree in Engineering Physics: an additional 60 ECTS credits must be passed (30 of them can be taken as optional courses on the bachelor's degree in Engineering Physics).

Applicants who have other technology degrees in fields such as Computer Engineering, Software Engineering, Informatics Engineering, Industrial Electronics and Automatic Control Engineering, Science and Technology, etc. may need to pass some courses in addition to those of the master's degree. These bridging courses are part of the [bachelor's degree in Telecommunications Technologies and Services Engineering](#) and are taught in Catalan or Spanish. The maximum number of credits for bridging courses is 60 ECTS.

The exact number of additional ECTS credits depends on the degree held by the applicant and will be decided by the academic committee of the master's degree.

Admission criteria

Language requirements:

CEFR English Level B2, which you can demonstrate in one of the following ways:

- Your mother tongue is English.
- You have studied in an English-speaking country (for at least one semester).
- You have taken an academic university programme taught in English (for at least one semester).
- You hold a European Higher Education Area degree that includes English Level B2.
- You hold one of the following English language certificates:
 - Cambridge: FCE
 - TOEFL PBT: ≥ 567 ; CBT: ≥ 227 ; IBT: ≥ 87
 - IELTS: 5.5
 - TOEIC: 750
 - Escuela Oficial de Idiomas: Certificado de nivel avanzado (Level 5)

- You obtain a B2 [English certificate at the UPC](#)

Knowledge of Catalan and Spanish may be helpful for daily life.

Find more information on the [Language services and resources at the UPC website](#).

Places

60 in September; 20 in February

Pre-enrolment

Pre-enrolment closed (consult the new pre-enrolment periods in the [academic calendar](#)).

[How to pre-enrol](#)

Enrolment

[How to enrol](#)

Legalisation of foreign documents

All documents issued in non-EU countries must be [legalised and bear the corresponding apostille](#).

DOUBLE-DEGREE AGREEMENTS

Double-degree pathways with universities around the world

- Master's degree in Telecommunications Engineering (en endavant **MET**, ETSETB) + Master's degree of Science in Engineering (To choose between 4 masters) (School of Electrical Engineering, KTH Royal Institute of Technology, Stockholm, Sweden)
- MET + Master in Management *Grande Ecole Degree de l'HEC* (École Des Hautes Études Commerciales (HEC), Paris) (Only ETSETB students to HEC, not vice versa)
- MET + *Diplôme d'Ingénieur ISAE-SUPAERO* (Institut Supérieur de l'Aéronautique et de l'Espace, Université Fédérale Toulouse Midi-Pyrénées, Toulouse, França)
- MET + *Maestría en Ingeniería de las Telecomunicaciones* (Escuela de Postgrado, Pontificia Universidad Católica del Perú (PUCP), Lima, Perú)
- MET + *Maestría en Sistema de Información* (Facultad de Ingeniería, Universidad Católica Andrés Bello (UCAB), Caracas, Venezuela)
- MET + Master's degree of Science in Engineering (Illinois Institute of Technology (IIT), Chicago, USA) (To choose between 4 masters) (Only ETSETB students to Illinois, not vice versa)
- MET + Master's degree in Electrical Engineering and Information Technology / Master's degree in Information and Communication Engineering (Department of Electrical Engineering and Information Technology, Technische Universität Darmstadt, Darmstadt, Germany)
- MET + / Master of Science in Telecommunications Engineering o Master of Science in Electronics Engineering (Ingegneria Industriale e dell'Informazione, Politecnico di Milano (POLIMI), Milan, Italy)

[More information](#)

PROFESSIONAL OPPORTUNITIES

Professional opportunities

The areas in which graduates of this master's degree may find employment are similar to those for graduates of the five-year degree in Telecommunications Engineering, although their profiles are enhanced by an extra academic year. Their careers may lead them to practise as:

Telecommunications engineers in any of the following areas:

- Telecommunications operations.
- Telecommunications equipment industry.
- Electronic equipment industry.
- Semiconductor industry.
- IT consulting firms (network solution designers, network planners and designers, network project leaders, etc.).
- IT companies, from content producers and distributors to service providers.
- Regulatory bodies.
- Software editing firms.
- Other industries such as cars manufacturers and consumer and industrial electronics companies, and areas such as health, energy, intelligent transport systems, logistics and mobility, agricultural and food, air and maritime transport, railway infrastructure, control systems and security of facilities and electronic services

transactions, as well as rapidly expanding areas such as smart cities, smart homes, smart grids and smart health.

Freelance professionals acting as telecommunications engineering advisors and consultants.

Sales engineers.

Civil servants or employees of public administrations at EU, national, regional and local level in the field of telecommunications and ICT innovation.

Research, development and innovation specialists in public and private companies.

Researchers and academics at public or private universities.

In addition to professionally oriented topics, the master's degree offers highly specialised optional subjects intended for those students who are looking to pursue a **doctoral degree in Telecommunications Engineering**.

Labour Market

Every three years, the Catalan University Quality Assurance Agency (AQU) publishes a [study](#) about the employability of Catalan university graduates.

The last of these studies, [Universities and Employment in Catalonia 2014](#) analyses the employability of students who graduated in the 2009-2010 academic year.

The [most significant labour market data](#) for telecommunication engineers are the following:

- The graduate employment rate is 92.6%.
- It takes 84% of graduates less than three months to find their first job.
- Of students who graduated in the 2009-2010 academic year, 78.5% earn over €2000 a month.
- Telecommunications engineering is in fourth place in the ranking of degree courses according to the Job Quality Index.

The Everis Foundation has issued a [ranking of universities](#) based on companies' views on the employability of new graduates. The UPC is the top Spanish university in the area of software and telecommunications engineering.

Competencies

Generic competencies

Generic competencies are the skills that graduates acquire regardless of the specific course or field of study. The generic competencies established by the UPC are capacity for innovation and entrepreneurship, sustainability and social commitment, knowledge of a foreign language (preferably English), teamwork and proper use of information resources.

Specific competencies

On completion of the course, students will have achieved competence in the following areas:

- Communication systems: wired and wireless, optical fibre.
- Computer networks, internet, local area networks (Ethernet, Wi-Fi).
- Voice networks, video distribution and television streaming, P2P, mobile networks.
- Security in communication networks: encryption, user authentication, digital signatures.
- Radio navigation, global positioning systems (GPS).
- Radar.
- Information processing: encoding, compression, error correction, image recognition, video clip recognition, voice recognition, voice generation.
- Electronic components and circuits: microprocessor devices (routers, switches, etc.), sensors, actuators, transducers.
- Technology and electronics, analogue and digital electronic instrumentation, medical electronics, consumer electronics, control systems, robotics, automation.

- Micro- and nanotechnologies.
- Bioengineering applications, telemedicine, e-commerce platforms, smart cities, smart metering, sensor networks, smart homes, green computing, cloud computing.

ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

Organizing teaching center

- [Technical School of Telecommunications Engineering of Barcelona \(ETSETB\)](#)

Academic program manager

- [Marcos Postigo](#)

Academic calendar

- [General academic calendar for degrees, masters and doctorates](#)
- [Current course \(class schedules, master's calendar, exams, teachers, ...\)](#)

Academic regulations

- [Academic regulations of the masters of the UPC](#)
- [Specific academic regulations for the MET and MEE masters](#)

Academic and administrative procedures

- [Pre-enrollment, registration, master's thesis, ...](#)
- [Mobility agreements to carry out the master's thesis at universities and foreign companies](#)
- [Business practices](#)

List of courses and teaching guides

- [Bridge](#)
- [Core](#)
- [Intensification](#)
- [Specialization](#)
- [Elective](#)

CURRICULUM

MET Curriculum

Master MET offers 3 types of academic paths:

- **Academic path without specialization:** If you want maximum flexibility in the elective subjects, choose this option. There are 45 compulsory ECTS credits, 15 ECTS credits from one intensification and you will have 30 more ECTS to choose among the different elective options. The final thesis has 30 ECTS.

- **Academic path with specialization:** If you want to be a specialist in one of the multiple areas of the electrical engineering, choose this option. There are 45 compulsory ECTS credits, 30 ECTS credits from the intensification that you prefer, and you will still have 15 more ECTS to choose among the different elective options. The final thesis has 30 ECTS.

The different specialisations are:

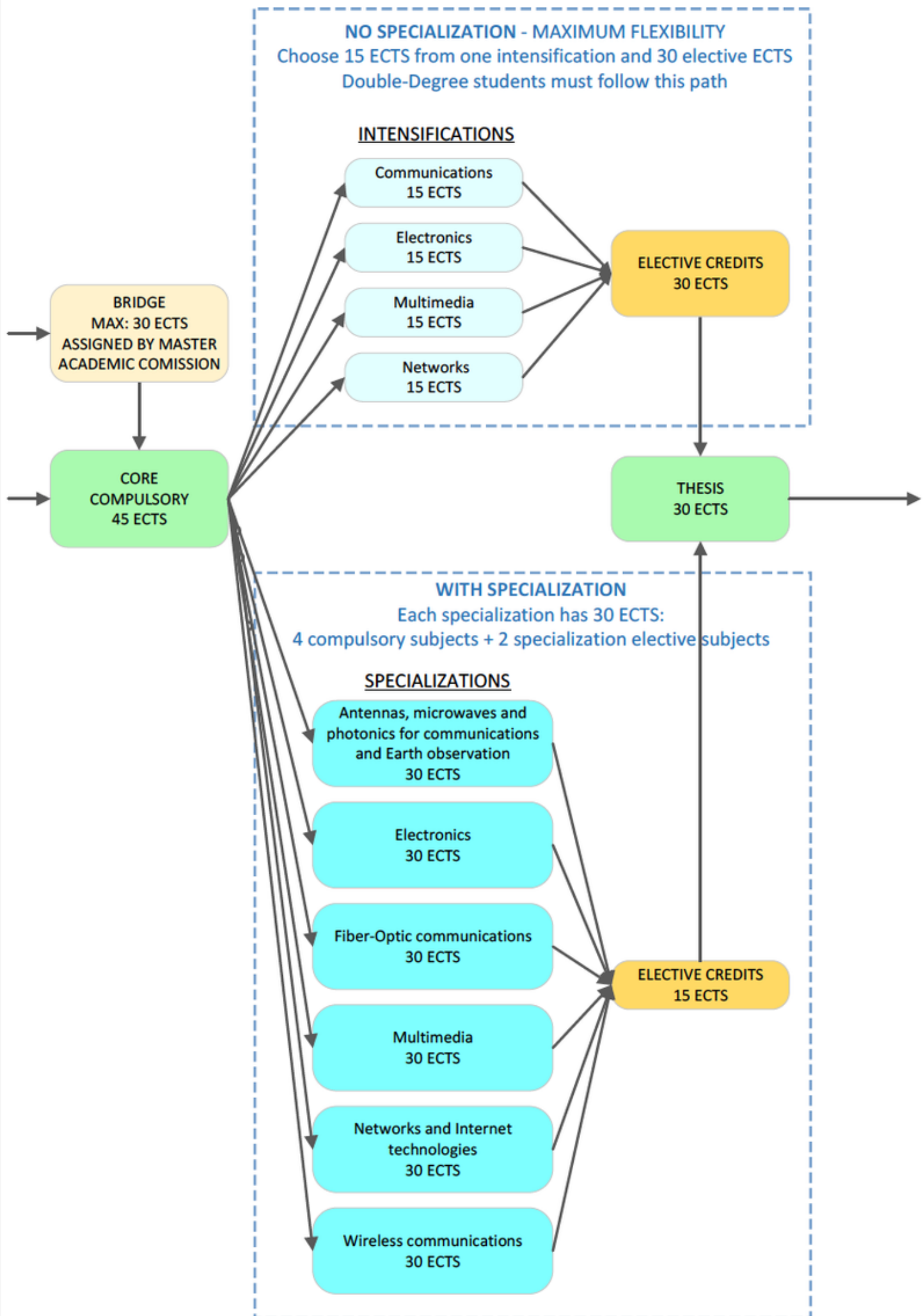
- Antennas, Microwaves and Photonics for Communications and Earth Observation
 - Electronics
 - Fibre Optic Communications
 - Networks and Internet Technologies
 - Multimedia
 - Wireless communications
- **Academic path with double-degree (limited places):** If you prefer maximum internationalization and another master degree, choose this option. You will have to enrol 45 compulsory ECTS credits, 15 ECTS credits from one intensification and 60 or 90 ECTS credits (that include the 30 ECTS of the thesis) at the foreign university.

Subjects are structured in different blocks:

- **Bridge subjects:** To be taken by students whose academic profile is not a general bachelor of telecommunications engineering. The Academic Commission of Masters assigns these courses to new students. These subjects do not extend the master, they use elective credits.

- **Core subjects:** Compulsory subjects.

- **Intensification subjects (Academic path without specialization):** The student must choose one intensification (Communications, Electronics, Multimedia or Networks) and take 3 subjects from a choice of 9. These subjects can be enrolled in different semesters, but the student must have passed 3 of the same intensification before finishing the master.
- **Specialization subjects (Academic path with specialization):** The student will take 4 specialization compulsory subjects and 2 specialization elective subjects.
- **Elective credits:** These credits can be divided between:
 - Elective subjects
 - Seminars
 - And one of the following three options:
 - Introduction to research subjects
 - Internships in companies or laboratories (15 ECTS).
 - Recognized for professional experience (10 ECTS maximum)
- **Master's Thesis**



Enrolment guide:

IMPORTANT NOTICE: Students willing to take a **double degree or a mobility stay** should:

- Take the intensification path.
- Pass all core subjects + 3 intensification subjects before the mobility.
- Should you have to enroll bridge courses during the first semester, set up a meeting with Vice-Dean Head of Master Studies (sotsdirmasters@etsetb.upc.edu) to plan the enrolment for first and second semesters.

First semester (30 ECTS).

1. All bridge subjects that have been assigned to you.
2. Core subjects. Any of them except MTP.
3. None or one elective/intensification/specialization subject. Any except IT and having into account these restrictions:
 - AFOC requires to simultaneously enrol TSYS.
 - AMC requires to simultaneously enrol TSYS.
 - QSN requires to simultaneously enrol CN and OVNET.
 - WAN requires to simultaneously enrol CN.

Second semester (30 ECTS): The rest of core subjects except MTP + intensification subjects + elective subjects. Without restrictions.

Third semester (30 ECTS): MTP + intensification subjects + elective subjects. Without restrictions.

Fourth semester (30 ECTS): Master's thesis.

In case that bridge subjects are required, these will be enrolled in first and second semesters depending on the subject availability and the academic profile of each applicant.

Students can make [mobility stays](#) of half or full year to choose among a great number of foreign universities. Usually, the period is the third semester and/or the master's thesis during the fourth semester.

In case that the student is taking a double degree or a mobility stay in the second year, MTP and the 3 intensification subjects must be passed during first and second semesters.

Internships in companies:

It is also possible to perform [internships in companies](#). In the master's framework, these internships can be curricular equivalent to 15 elective ECTS, curricular to do the master's thesis or extracurricular (do not recognize credits).

The ETSETB has a long collaboration tradition with companies. In this [link](#) you may see the companies that have offered internships during the last years.

Subjects	ECTS credits	Type
COMPULSORY		
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory

Subjects	ECTS credits	Type
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
Specialisation in Specialisation in Antennas, Microwaves and Photonics for Communications and Earth Observation		
Laboratory of Antennas and Microwaves for Communication Systems	5	Compulsory
Laboratory of Antennas and Microwaves for Communication Systems	5	Compulsory
Microwave Photonics and Terahertz Research and Applications	5	Compulsory
Microwave Photonics and Terahertz Research and Applications	5	Compulsory
Radar, Radionavigation and Location Systems	5	Compulsory
Radar, Radionavigation and Location Systems	5	Compulsory
Radar, Radionavigation and Location Systems	5	Compulsory
Remote Sensing for Earth Observation	5	Compulsory
Remote Sensing for Earth Observation	5	Compulsory
Remote Sensing for Earth Observation	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
Specialisation in Specialisation in Electronics		
Advanced Analog Circuit Techniques	5	Compulsory
Advanced Analog Circuit Techniques	5	Compulsory
Design of Analog Microelectronic Circuits	5	Compulsory
Electronics for Communications Systems	5	Compulsory
Electronics for Communications Systems	5	Compulsory
Fundamentals of Semiconductor Devices	5	Compulsory
Introduction to Measurement Systems	5	Compulsory
Introduction to Microelectronic Design	5	Compulsory
Introduction to Microelectronic Technologies	5	Compulsory
Introduction to Microelectronic Technologies	5	Compulsory
Sensors, Instruments and Measurement Systems	5	Compulsory
Sensors, Instruments and Measurement Systems	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
Specialisation in Specialisation in Fiber Optic Communications		
Optical Fiber Telecommunications	5	Compulsory
Optical Fiber Telecommunications	5	Compulsory
Optical Fiber Telecommunications	5	Compulsory
Optical Fiber Telecommunications	5	Compulsory
Optical Fiber Telecommunications Lab	5	Compulsory
Optical Fiber Telecommunications Lab	5	Compulsory
Optical Fiber Telecommunications Lab	5	Compulsory
Optical Fiber Telecommunications Lab	5	Compulsory
Optical Networks	5	Compulsory
Optical Networks	5	Compulsory
Optical Networks	5	Compulsory
Optical Networks	5	Compulsory
Quantum Optical Communications	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
Specialisation in Specialisation in Multimedia		
Biometrics	5	Compulsory
Biometrics	5	Compulsory
Digital Image and Video Processing	5	Compulsory
Digital Image and Video Processing	5	Compulsory
Digital Speech and Audio Processing	5	Compulsory
Digital Speech and Audio Processing	5	Compulsory
Machine Learning From Data	5	Compulsory
Machine Learning From Data	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory

Subjects	ECTS credits	Type
Specialisation in Specialisation in Networks and Internet Technologies		
Distributed Systems, Internet and Web Technologies	5	Compulsory
Network Science	5	Compulsory
Network Science	5	Compulsory
Network Science	5	Compulsory
Network Security	5	Compulsory
Network Security	5	Compulsory
Network Security	5	Compulsory
Quality of Service in Networks	5	Compulsory
Quality of Service in Networks	5	Compulsory
Quality of Service in Networks	5	Compulsory
Web & Mobile App Development	5	Compulsory
Web & Mobile App Development	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
Specialisation in Specialisation in Wireless Communications		
5G Mobile Communications Systems	5	Compulsory
5G Mobile Communications Systems	5	Compulsory
Advanced Mobile Communications	5	Compulsory
Advanced Signal Processing: Tools and Applications	5	Compulsory
Advanced Signal Processing: Tools and Applications	5	Compulsory
Advanced Signal Processing: Tools and Applications	5	Compulsory
Short Range Communications	5	Compulsory
Short Range Communications	5	Compulsory
Short Range Communications	5	Compulsory
Wireless Laboratory	5	Compulsory
Wireless Laboratory	5	Compulsory
Wireless Laboratory	5	Compulsory
Advanced Communications for Wireless Systems	5	Compulsory
Communication Networks	5	Compulsory
Electronic Instrumentation and Optoelectronics	5	Compulsory
Electronic System Design for Communications	5	Compulsory
Innovation Based Service Management	5	Compulsory
Management of Telecommunications Projects	5	Compulsory
Overlay Networks	5	Compulsory
Telecommunications Systems	5	Compulsory
Wireless Communication Links and Antennas	5	Compulsory
OPTIONAL		
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (IoT)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
Introduction to Research 1	5	Optional
Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
Laboratory on Ultrasonic Electronics	3	Optional
Laser Applications in Remote Sensing: Lidar	3	Optional
Lidar Processing and Inversion: Applications to Remote Sensing of Physical Parameters	2.5	Optional
Lidar Remote Sensing	2.5	Optional
Marine Technology Instrumentation	5	Optional
Matlab Programed Arduino for Control Applications	2.5	Optional
Matrix Algebra, Accelerated Program	3	Optional
Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
Power Control and Processing	5	Optional
Power Electronic Circuits	5	Optional
Principles of Control and Power Electronics	5	Optional
Printed Circuit Board Design	2.5	Optional

Subjects	ECTS credits	Type
Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with FitSM	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6g: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

	ECTS credits	Type
Specialisation in Specialisation in Antennas, Microwaves and Photonics for Communications and Earth Observation		
Advanced Mobile Communications	5	Optional
AI and Big Data for Earth Observation	5	Optional
Array Processing and Smart Antennas	5	Optional
Beam Propagation and Fourier Optics	5	Optional
Digital Image and Video Processing	5	Optional
GPS and Galileo Data Processing: From Fundamentals to High Accuracy Navigation	5	Optional
Introduction to Photonics, Optics and Lasers	5	Optional
Machine Learning From Data	5	Optional
Microwave Imaging for Remote Sensing	5	Optional
Microwave Imaging for Remote Sensing	5	Optional
Microwave Imaging for Remote Sensing	5	Optional
Numerical Methods for Electromagnetic Engineering	5	Optional
Numerical Methods for Electromagnetic Engineering	5	Optional
Numerical Methods for Electromagnetic Engineering	5	Optional
Optical Fiber Telecommunications	5	Optional
Optical Remote Sensing: Lidar (Laser Radar)	5	Optional
Optical Remote Sensing: Lidar (Laser Radar)	5	Optional
Optical Remote Sensing: Lidar (Laser Radar)	5	Optional
Photonics Systems in Telecommunications	3	Optional
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (IoT)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6G	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
Introduction to Research 1	5	Optional
Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
Laboratory on Ultrasonic Electronics	3	Optional
Laser Applications in Remote Sensing: Lidar	3	Optional
Lidar Processing and Inversion: Applications to Remote Sensing of Physical Parameters	2.5	Optional
Lidar Remote Sensing	2.5	Optional
Marine Technology Instrumentation	5	Optional
Matlab Programed Arduino for Control Applications	2.5	Optional
Matrix Algebra, Accelerated Program	3	Optional
Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
Power Control and Processing	5	Optional
Power Electronic Circuits	5	Optional
Principles of Control and Power Electronics	5	Optional
Printed Circuit Board Design	2.5	Optional
Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with FitSM	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6G: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

	ECTS credits	Type
Advanced Digital Systems	5	Optional
Advanced Digital Systems	5	Optional
Digital Nanoelectronic Design	5	Optional
Electronic Measurement Science and Technology	5	Optional
High-Level Digital Design	5	Optional
Instrumentation and Sensors	5	Optional
Instrumentation and Sensors	5	Optional
Micro and Nano Electronic Design	5	Optional
Micro and Nano Electronic Design	5	Optional
Micro and Nanotechnologies	5	Optional
Micro and Nanotechnologies	5	Optional
Nanotechnologies and Electron Devices	5	Optional
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (Iot)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
Introduction to Research 1	5	Optional
Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
Laboratory on Ultrasonic Electronics	3	Optional
Laser Applications in Remote Sensing: Lidar	3	Optional
Lidar Processing and Inversion: Applications to Remote Sensing of Physical Parameters	2.5	Optional
Lidar Remote Sensing	2.5	Optional
Marine Technology Instrumentation	5	Optional
Matlab Programed Arduino for Control Applications	2.5	Optional
Matrix Algebra, Accelerated Program	3	Optional
Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
Power Control and Processing	5	Optional
Power Electronic Circuits	5	Optional
Principles of Control and Power Electronics	5	Optional
Printed Circuit Board Design	2.5	Optional
Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with Ftsm	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6g: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

	ECTS credits	Type
5G Mobile Communications Systems	5	Optional
5G Mobile Communications Systems	5	Optional
5G Mobile Communications Systems	5	Optional
Advanced Signal Processing: Tools and Applications	5	Optional
Future (Inter)Net(Works)	5	Optional
Machine Learning From Data	5	Optional
Machine Learning From Data	5	Optional
Matlab: Fundamentals And/Or Applications	5	Optional
Matlab: Fundamentals And/Or Applications	5	Optional
Matlab: Fundamentals And/Or Applications	5	Optional
Matlab: Fundamentals And/Or Applications	5	Optional
Optical Fiber Sensor Technologies	5	Optional
Optical Fiber Sensor Technologies	5	Optional
Optical Fiber Sensor Technologies	5	Optional
Optical Fiber Sensor Technologies	5	Optional
Photonic Integrated Devices for Telecom & lot	5	Optional
Quality of Service in Networks	5	Optional
Quality of Service in Networks	5	Optional
Secure Communications in Fiber-Optic Networks	5	Optional
Secure Communications in Fiber-Optic Networks	5	Optional
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (lot)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
Introduction to Research 1	5	Optional
Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
Laboratory on Ultrasonic Electronics	3	Optional
Laser Applications in Remote Sensing: Lidar	3	Optional
Lidar Processing and Inversion: Applications to Remote Sensing of Physical Parameters	2.5	Optional
Lidar Remote Sensing	2.5	Optional
Marine Technology Instrumentation	5	Optional
Matlab Programed Arduino for Control Applications	2.5	Optional
Matrix Algebra, Accelerated Program	3	Optional
Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
Power Control and Processing	5	Optional
Power Electronic Circuits	5	Optional
Principles of Control and Power Electronics	5	Optional
Printed Circuit Board Design	2.5	Optional
Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with Ftsm	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6g: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

	ECTS credits	Type
Advanced Human Language Technologies	5	Optional
Computer Vision with Deep Learning	5	Optional
Computer Vision with Deep Learning	5	Optional
Cybersecurity Management	5	Optional
Deep Learning for Artificial Intelligence	5	Optional
Deep Learning for Artificial Intelligence	5	Optional
Quality of Service in Networks	5	Optional
Quality of Service in Networks	5	Optional
Speech and Language Processing with Deep Learning	5	Optional
Speech and Language Processing with Deep Learning	5	Optional
Web & Mobile App Development	5	Optional
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (IoT)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
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Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
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Lidar Remote Sensing	2.5	Optional
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Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
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Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with Ftsm	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6g: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

Specialisation in Specialisation in Networks and Internet Technologies

	ECTS credits	Type
Cybersecurity Management	5	Optional
Cybersecurity Management	5	Optional
Cybersecurity Usecases	5	Optional
Cybersecurity Usecases	5	Optional
Data Protection	5	Optional
Data Protection	5	Optional
Distributed Systems, Internet and Web Technologies	5	Optional
Internet and Networked Economy	5	Optional
Internet and Networked Economy	5	Optional
Internet and Networked Economy	5	Optional
Network Security - Authentication and Authorization	5	Optional
Network Security - Authentication and Authorization	5	Optional
Optimization and Artificial Intelligence Techniques in Network Management	5	Optional
Optimization and Artificial Intelligence Techniques in Network Management	5	Optional
Short Range Communications	5	Optional
Short Range Communications	5	Optional
Short Range Communications	5	Optional
Wireless Access Networks	5	Optional
Wireless Access Networks	5	Optional
Wireless Access Networks	5	Optional
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional
Antennas and Microwaves	5	Optional
Artificial Intelligence and Internet of Things (IoT)	3	Optional
Automotive Embedded Systems	5	Optional
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional
Big Gns Data: From Remote Sensing to Space Weather	3	Optional
Blockchain	5	Optional
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional
Building Your Career. From Academia to Startups & Beyond	2.5	Optional
Coding of Audiovisual Contents	5	Optional
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional
Configurable Digital Electronics	5	Optional
Control and Applications in Power Electronics	5	Optional
Control Theory and Applications	5	Optional
Critical Thinking and Creativity	5	Optional
Cubesat-Based Mission Design and Testing	5	Optional
Data Privacy	5	Optional
Data Transmission Protocols	5	Optional
Deep Learning for Computer Vision	2.5	Optional
Deep Learning for Speech and Language	2.5	Optional
Deep Learning for Vision	3	Optional
Digital Communications	5	Optional
Earth and Cosmos	5	Optional
Entrepreneurship for World Challenges	5	Optional
Fiber Optic Infrastructure for 5G Networks	2.5	Optional
Fibers and Telecommunications	3	Optional
Financial Engineering: Applications to Information Technology Projects	2.5	Optional
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional
Graph Signal Processing	3	Optional
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional
Hands-On Quantum Computing and Artificial Intelligence	3	Optional
Integrated Photonics	3	Optional
Interdisciplinary Innovation Project	5	Optional
Introduction to Research 1	5	Optional
Introduction to Research 2	5	Optional
Introduction to Research 3	5	Optional
Laboratory on Ultrasonic Electronics	3	Optional
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Lidar Remote Sensing	2.5	Optional
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Matrix Algebra, Accelerated Program	3	Optional
Microwave Photonics	2.5	Optional
Modern Channel Coding	3	Optional
Natural Language Processing with Deep Learning	3	Optional
Network Performance Analysis and Evaluation	5	Optional
Networking and Future Internet Opportunities	5	Optional
New Telecom Markets	3	Optional
Optoelectronics and Photovoltaic Technology	3	Optional
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional
Power Control and Processing	5	Optional
Power Electronic Circuits	5	Optional
Principles of Control and Power Electronics	5	Optional
Printed Circuit Board Design	2.5	Optional
Programmable Electronics	5	Optional
Quantum Communication and Computation	3	Optional
Quantum Cryptography	5	Optional
Quantum Information Theory	2.5	Optional
Satellite Communications and Non-Terrestrial Networks	3	Optional
Secure Optical Networks	3	Optional
Seminar on Advanced Telecommunication Technologies	3	Optional
Seminar on Blockchain	3	Optional
Service Management with Ftsm	3	Optional
Signal Processing	5	Optional
Social Networks: Theory and Implementation	5	Optional
Software Architecture	5	Optional
Software-Based Digital Control Applications	2.5	Optional
Solar Cells for Dummies	2.5	Optional
Stochastic Processes	2.5	Optional
Systems Based on Microprocessors	5	Optional
Technology Asset Management	5	Optional
Telecommunication Markets	5	Optional
Telecommunication Systems Fundamentals	5	Optional
Telecommunications and Electronics Seminar	2.5	Optional
The Connected Vehicle	2.5	Optional
The Way to 6g: Future Trends in Mobile Communications	3	Optional
Transoceanic Communications	2.5	Optional
Waves and Systems	5	Optional

	ECTS credits	Type	
Specialisation in Specialisation in Wireless Communications			
Applied Convex Optimization	5	Optional	
Applied Convex Optimization	5	Optional	
Applied Convex Optimization	5	Optional	
Array Processing and Smart Antennas	5	Optional	
Array Processing and Smart Antennas	5	Optional	
Array Processing and Smart Antennas	5	Optional	
Array Processing and Smart Antennas	5	Optional	
Artificial Intelligence-Enabled 5G Radio Networks	5	Optional	
Artificial Intelligence-Enabled 5G Radio Networks	5	Optional	
Artificial Intelligence-Enabled 5G Radio Networks	5	Optional	
Information Theory	5	Optional	
Information Theory	5	Optional	
Information Theory	5	Optional	
Resource Management in Wireless Communications	5	Optional	
Resource Management in Wireless Communications	5	Optional	
Alternative Computing Strategies with Emerging Nanoelectronic Devices	3	Optional	
Antennas and Microwaves	5	Optional	
Artificial Intelligence and Internet of Things (IoT)	3	Optional	
Automotive Embedded Systems	5	Optional	
Basic Mathematics for Algebraic Coding Theory with Applications to Cryptography	2.5	Optional	
Big Gns Data: From Remote Sensing to Space Weather	3	Optional	
Blockchain	5	Optional	
Brief Course on The Mathematics Behind Coding Theory and Cryptography	3	Optional	
Building Your Career: From Academia to Startups & Beyond	2.5	Optional	
Coding of Audiovisual Contents	5	Optional	
Cognitive Radio and Spectrum Sharing: a Key Technology of 5G Networks	2.5	Optional	
Configurable Digital Electronics	5	Optional	
Control and Applications in Power Electronics	5	Optional	
Control Theory and Applications	5	Optional	
Critical Thinking and Creativity	5	Optional	
Cubesat-Based Mission Design and Testing	5	Optional	
Data Privacy	5	Optional	
Data Transmission Protocols	5	Optional	
Deep Learning for Computer Vision	2.5	Optional	
Deep Learning for Speech and Language	2.5	Optional	
Deep Learning for Vision	3	Optional	
Digital Communications	5	Optional	
Earth and Cosmos	5	Optional	
Entrepreneurship for World Challenges	5	Optional	
Fiber Optic Infrastructure for 5G Networks	2.5	Optional	
Fibers and Telecommunications	3	Optional	
Financial Engineering: Applications to Information Technology Projects	2.5	Optional	
Future Trends in Mobile Communications: From 5G to 6g	2.5	Optional	
Graph Signal Processing	3	Optional	
Graphene and Carbon Nanotubes Introduction and Fundamentals	2.5	Optional	
Hands-On Quantum Computing and Artificial Intelligence	3	Optional	
Integrated Photonics	3	Optional	
Interdisciplinary Innovation Project	5	Optional	
Introduction to Research 1	5	Optional	
Introduction to Research 2	5	Optional	
Introduction to Research 3	5	Optional	
Laboratory on Ultrasonic Electronics	3	Optional	
Laser Applications in Remote Sensing: Lidar	3	Optional	
Lidar Processing and Inversion: Applications to Remote Sensing of Physical Parameters	2.5	Optional	
Lidar Remote Sensing	2.5	Optional	
Marine Technology Instrumentation	5	Optional	
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Microwave Photonics	2.5	Optional	
Modern Channel Coding	3	Optional	
Natural Language Processing with Deep Learning	3	Optional	
Network Performance Analysis and Evaluation	5	Optional	
Networking and Future Internet Opportunities	5	Optional	
New Telecom Markets	3	Optional	
Optoelectronics and Photovoltaic Technology	3	Optional	
Photonic Systems in Telecommunications: Lidar (Laser Radar)	3	Optional	
Power Control and Processing	5	Optional	
Power Electronic Circuits	5	Optional	
Principles of Control and Power Electronics	5	Optional	
Printed Circuit Board Design	2.5	Optional	
Programmable Electronics	5	Optional	
Quantum Communication and Computation	3	Optional	
Quantum Cryptography	5	Optional	
Quantum Information Theory	2.5	Optional	
Satellite Communications and Non-Terrestrial Networks	3	Optional	
Secure Optical Networks	3	Optional	
Seminar on Advanced Telecommunication Technologies	3	Optional	
Seminar on Blockchain	3	Optional	
Service Management with Ftsm	3	Optional	
Signal Processing	5	Optional	
Social Networks: Theory and Implementation	5	Optional	
Software Architecture	5	Optional	
Software-Based Digital Control Applications	2.5	Optional	
Solar Cells for Dummies	2.5	Optional	
Stochastic Processes	2.5	Optional	
Systems Based on Microprocessors	5	Optional	
Technology Asset Management	5	Optional	
Telecommunication Markets	5	Optional	
Telecommunication Systems Fundamentals	5	Optional	
Telecommunications and Electronics Seminar	2.5	Optional	
The Connected Vehicle	2.5	Optional	
The Way to 6g: Future Trends in Mobile Communications	3	Optional	
Transoceanic Communications	2.5	Optional	
Waves and Systems	5	Optional	
PROJECT			
Master's Thesis	30	Project	
Specialisation in Specialisation in Antennas, Microwaves and Photonics for Communications and Earth Observation	Master's Thesis	30	Project
Specialisation in Specialisation in Electronics	Master's Thesis	30	Project
Specialisation in Specialisation in Fiber Optic Communications	Master's Thesis	30	Project

Subjects		ECTS credits	Type
Specialisation in Specialisation in Multimedia	Master's Thesis	30	Project
Specialisation in Specialisation in Networks and Internet Technologies	Master's Thesis	30	Project
Specialisation in Specialisation in Wireless Communications	Master's Thesis	30	Project

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