Politecnico di Torino

ACADEMIC REGULATIONS

Bachelor's degree programme
in
ELECTRONIC AND COMMUNICATIONS ENGINEERING

Department of Electronics and Telecommunications
Collegio di Ingegneria Elettronica, delle Telecomunicazioni e Fisica

Academic Year **2025/2026**

The English translation of this document is provided as a support to the student community and has no legal effects. The Italian version shall constitute the sole authentic text and will be referred to for any legal matter.

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Art. 1 – Specific learning objectives and career prospects

1.1 Specific Learning Objectives

The degree programme has been designed to train professionals with cross-disciplinary skills in the field of ICT (Information and Communication Technology), which are highly sought after by both the Italian and international industrial sectors. The choice of English as the medium of instruction is motivated by the fact that most textbooks and standards are in English; therefore Politecnico aims to help ECE graduates enter into the global ICT market.

The programme is organized in a way that enables students to acquire knowledge and skills in both Electronics and Telecommunications. The ECE Bachelor's degree programme offers a broad-based curriculum that balances in-depth study of Electronics and Telecommunications with a solid foundation in related fields such as Computer Science and Industrial Automation. Compared to the Bachelor's degree programme in Electronic Engineering at Politecnico di Torino, the ECE programme includes a greater focus on telecommunications, with a corresponding reduction in electronics-related credits. Compared to the Bachelor's degree programme in Computer Engineering, the ECE programme provides more extensive coverage of electronics and information transmission, with fewer credits in computer science. As a result, the ECE programme is an interdisciplinary course of study within the ICT field.

ECE students are trained to design and manage ICT systems. The programme prepares graduates to become junior designers of electronic and/or IT systems, technical-sales experts (in charge of equipment sales and maintenance), and telecommunications systems managers. Graduates who wish to continue their studies can pursue a Master's degree in Electronics, Telecommunications or Computer Engineering.

The ability to analyse, design and manage ICT systems requires a range of skills and competencies in telecommunications engineering (signal processing, data transmission, communication networks), electronic engineering (amplifiers and filters, measurement systems, antennas), computer engineering (algorithms, complexity, data structures) and automation engineering (control systems). These skills and competencies can only be built on a solid knowledge base in mathematics, physics, chemistry and electrical engineering.

1.2 Career prospects

The Bachelor's degree programme aims to train a variety of professional profiles. The career prospects and main competencies associated to each profile are illustrated below.

Professional Profile	Main functions and competencies
Telecommunications Systems Manager	Functions: ECE graduates (Electronic and Communications Engineering) learn skills that enable them to work in teams that manage, maintain and develop telecommunication networks at various levels. These range from medium-to-large local networks to the transport networks of national telecom operators, as well as different types of corporate information systems. Competencies: • using software/hardware tools to identify the causes of malfunctions in a telecommunications network; • installing transmission/reception equipment; • selecting and purchasing devices, verifying their compatibility and required performance; • developing Internet applications Courses contributing to the training of this professional profile include: • Signals and Systems • Digital Transmission • Communication Networks • Applied Electronics • Electromagnetic Waves and Antennas • Electronic Measurements

	Potential employers: • major national and international telecommunications operators • network management roles in medium-to-large enterprises.
Digital Signal Processing Systems Designer	Functions: A Digital Signal Processing (DSP) systems designer develops signal processing systems that are applicable to various fields beyond telecommunications, such as bioengineering, industrial automation, automatic control, automotive and railway industries. Competencies: • using software tools for the design of signal processing systems and subsystems • managing fundamental technologies for digital signal processing Courses contributing to the training of this professional profile include: • Signals and Systems • Digital Transmission • Communication Networks Career Prospects: Digital signal processing is a widely sought-after skill across many industries. In addition to companies manufacturing telecommunications equipment, DSP techniques are essential in biomedical systems, automotive industries, automatic control systems, and audio and video surveillance.
Technical Sales Engineer	Functions: ECE engineers working in technical sales are responsible for supporting customers throughout all phases, from specification definition to sales and post-sales services, for ICT products (hardware or software) with high technological content. They can organize and do presentations and demonstrations of electronic and/or telecommunications systems at specialized trade fairs or directly with the client. Competencies: Engaging with customers — including individuals, companies, and institutions — who purchase ICT equipment, particularly high-value-added devices, requires specific technical skills alongside strong communication and sales management abilities. ECE engineers in this role know electronic components and systems (especially complex boards and devices), reliability, maintenance, performance, and energy consumption aspects. They are also proficient in software for configuring programmable electronic devices. Although all courses of the degree programme contribute to the training of this profile, the most important courses include: • Applied Electronics • Electromagnetic Waves and Antennas • Digital Transmission • Communication Networks • Electronic Measurements Career Prospects: Companies involved in the manufacturing, marketing, and distribution of electronic, IT and biomedical devices and equipment.

Junior Engineer – Expert in Assistance and Maintenance	Functions: ECE engineers employed in the field of technical maintenance and customer support can use electronic instrumentation and software and know how to apply techniques for fault detection and testing of ICT devices. Competencies: The competencies required to perform assistance and maintenance tasks on ICT devices are related to knowledge of electronic board manufacturing technology, component features (interfacing, power supply, timing, signal dynamics), electronic measurement instrumentation, and the software used to manage such tools. These engineers are responsible for: • Modifying the software/firmware configuration of programmable electronic systems • Identifying and repairing malfunctions Courses that provide these competencies include: • Electronic Circuits • Applied Electronics • Digital Systems Electronics Potential Employers: Companies involved in the production, commercialization, and distribution of electronic, IT, and biomedical products and devices.
Junior Designer	Functions: ECE graduates specialized in design have acquired broad and diversified knowledge and skills in ICT application sectors. They can therefore work in various fields, such as design, production, management-organization, technical-commercial support, risk analysis, and safety management in both prevention and emergency phases. These activities can be carried out as a freelancer or within manufacturing or service companies, as well as in public administrations. Competencies: • Designing electronic systems using CAD tools • Designing systems specific to IT, telecommunications, automation, and measurement fields, understanding the challenges of each sector (complexity, energy consumption, physical dimensions) • Making use of sensors and actuators within hardware systems • Producing and installing electronic systems • Purchasing electronic systems and interfacing them Key courses that contribute to the training of a junior designer include: • Electronics Circuits • Digital Systems Electronics • Applied Electronics • Signals and Systems • Automatic Control Potential Employers: Companies involved in the production of goods or services in the ICT sector and other economic sectors, such as mechanical engineering. Design firms. Public and private organizations.

Preparation for continuing studies	Background knowledge required to pursue a Master's degree
Master's degree programme in Electronics or in Computer and Communication Network Engineering or other ICT-related Master's degree programmes	Graduates must possess fundamental knowledge of electronic and telecommunications engineering. They must be able to deepen their understanding of the theoretical and methodological aspects of electronic and telecommunications engineering disciplines. They should be capable of addressing innovative and highly methodological aspects and carrying out design activities, even of high complexity. They must be able to analyse and apply the specific methodologies of electronic and telecommunications engineering. Graduates should have an aptitude for innovation processes and the ability to enhance their professional competencies through continuous learning. They must be able to analyse a broad spectrum of situations and problems by applying general ICT knowledge. They should be able to identify missing information required to solve specific problems and know the methods to acquire such information. Additionally, they must be able to work independently, manage projects, and communicate technical information—either directly or through appropriate documentation and tools—even to individuals outside the ICT sector.

1.3 Professional profiles (ISTAT codes)

With reference to the list of professional profiles classified by ISTAT (Italian National Institute of Statistics, https://www.istat.it/en/), graduates from this Bachelor's degree programme can work as:

ISTAT code	Description
3.1.2.2.0	Tecnici esperti in applicazioni
3.1.2.5.0	Tecnici gestori di reti e di sistemi telematici
3.1.2.6.1	Tecnici per le telecomunicazioni
3.1.2.6.2	Tecnici delle trasmissioni radio-televisive
3.1.3.4.0	Tecnici elettronici

Art. 2 - Admission requirements

To be admitted to this Bachelor's degree programme, applicants must hold a high school diploma (as required by current regulations) or an equivalent qualification obtained abroad, recognized as valid. Additionally, they must have or must attain an appropriate level of initial background knowledge.

The number of admissible students is determined annually by the Governing Bodies of Politecnico based on locally programmed admissions, considering the available facilities and the student-to-faculty ratio.

The number of available places and the admission procedures are specified in the official Call for applications for admissions published at https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/bachelor-s-degree-programmes/calls-for-application-regulations-and-ranking-lists .

In particular, for enrolment in this Bachelor's degree programme, applicants must take an admission test (TIL-I test), administered in different sessions according to a specific calendar published on the recruitment web pages.

The test is conducted using the technical equipment available in the computer laboratories of the University.

The minimum score required to be included in the ranking list is set at 30% of the total score. Applicants may take the TIL-I test up to a maximum of three times. In the event of multiple attempts, the highest score obtained by the applicant will be considered valid. The test consists of answering 42 questions in 1 hour and 30 minutes. These questions are divided into four sections covering four different subject areas: Mathematics, Reading Comprehension and Logical Reasoning, Physics, and Basic Technical Knowledge.

Applicants who score below 30% in the Mathematics section will have to fulfil some supplementary academic obligations (in Italian, Obblighi Formativi Aggiuntivi - OFA).

They will be invited to attend tutoring math classes during Year 1 and they must attend a supplementary course. This course, called C.I.A.O. - Corso Interattivo di Accompagnamento Online (Interactive Online Support Course), is normally offered in the week before the beginning of classes. It seeks to help applicants fill in the gaps in their Math knowledge through specific online tutoring sessions.

The OFA requirements will be considered fulfilled if, by the end of Year 1, at least one of the following conditions is met:

- students pass one of the two Mathematics exams of Year 1 (Mathematical Analysis I or Linear Algebra and Geometry);
- students pass the final test of the CIAO course by correctly answering at least 10 out of 15 questions. This test will be offered three times during the academic year.

Any exemptions from taking the admission test are specified in the Call for applications for admissions to the Bachelor's degree programmes of Politecnico di Torino.

Since all the courses of this Bachelor's degree programme are taught exclusively in English, at the time of enrolment students must have an English language certificate (B2-level or above), as defined by the Common European Framework of Reference for Languages (CEFR).

For more information regarding the Call for applications, the number of admissions, the admission test registration and enrolment procedures, please visit: https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/bachelor-s-degree-programmes/calls-for-application-regulations-and-ranking-lists .

Art. 3 - Programme curriculum

3.1 Programme overview

The Bachelor's degree programme is organized over three years. Year 1, common to all engineering programmes, provides students with the fundamental knowledge and skills in mathematics, chemistry, physics and computer science.

In Year 2, students acquire:

- additional knowledge and skills in physics, essential for the study of electronics and electromagnetic fields;
- additional knowledge and skills in mathematics, necessary for the study of systems and algorithms;
- knowledge and skills in electrical engineering, fundamental for the study of electronics, signal processing and transmission systems;
- knowledge and skills in electronics and control systems.

In Year 3 students complete their training with:

- further knowledge and skills in electronics and electromagnetic fields;
- knowledge and skills in telecommunications engineering (signal processing, data transmission, and telecommunication networks);
- knowledge and skills in programming (algorithms and their complexity).

During Year 3, students have the opportunity to do an internship at a company.

The final examination consists in preparing a written report independently.

Students can attend part of their courses abroad during Year 2 or Year 3 and may obtain a double degree through agreements with partner universities in other countries. These agreements are defined annually and are usually communicated to students at the end of Year 1.

3.2 Organization of educational activities

The list of courses (compulsory and optional), curricula, possible organization of courses into modules, any pre-requisites and exclusions and the list of the faculty members responsible for the courses are available at: https://didattica.polito.it/pls/portal30/sviluppo.offerta_formativa_2019.vis?p_a_acc=2026&p_sdu=37&p_cds=474

The list of the Scientific Disciplinary Fields (Settori Scientifico Disciplinari) for each activity (specific subjects and complementary subjects) is available at: https://didattica.polito.it/pls/portal30/sviluppo.vis_aig_2023.visualizza?sducds=37474&tab=0&p_a_acc=2026

Art. 4 - Student career

The Student Guide is published on the Teaching Portal every year before the beginning of the academic year. There is a specific Student Guide for each Bachelor's degree programme. The Student Guide is available on the web site of the degree programme.

It contains information and deadlines on:

- academic calendar;
- supplementary academic obligations (Obblighi Formativi Aggiuntivi - OFA);
- Personal Study Plan and Annual Personal Study Plan;
- free choice credits;
- internships;
- tuition fees;
- dual career;
- classes and exams;
- class delivery;
- foreign language learning;
- studying abroad/mobility programmes;
- exam rules;
- transfers in/out and internal transfers;
- interruption, suspension, withdrawal, forfeiture;
- credit transfer.

Art. 5 – Final Examination

For the Final Examination students are required to autonomously prepare a written paper (final project). The final project is worth 3 credits and involves in-depth studies, analyses, developments or applications of the topics covered in the courses of the Bachelor's degree programme, or other topics consistent with the educational objectives of the programme.

Its purpose is to assess students' ability to integrate the knowledge acquired in different courses through an in-depth study of interdisciplinary laboratory experiences, resulting in the drafting of a technical report.

The final examination requires students to write a technical report on the design and/or analysis of a transmission subsystem (a part of the receiver, transmitter or channel). The project is assigned to students during the course associated with the final examination.

Students are required to write a final project. The examination board of the course assesses the final project based on the approach, numerical accuracy, appropriate use of technical language and clarity of presentation.

The final project must be written in English. Part of the credits are associated with the core courses offered in Year 3.

The workload for completing the final project is approximately 75 hours. No public defence is required.

Students must submit their Final Examination application online through a dedicated procedure available on their personal page of the Teaching Portal under the portlet called "Degree and Final Examination", ensuring they meet the deadlines for the desired graduation period as published in the Student Guide – Thematic Calendar section.

The final grade is determined by the Graduation Examining Committee, which evaluates the overall average of the exams on a scale of 110 after having subtracted the 16 worst credits. This number is proportionally reduced if some of the exams have been validated without a grade (pass-or-fail exams) or in the event of credit transfer, since only the exams taken at Politecnico are taken into consideration for this calculation. Additionally, the Committee may add up to a maximum of 5 points to this average, considering:

- the number of years it took the student to complete his/her studies;
- the evaluation of the entire educational path (partially or completely English-taught)
- other information about the student's course of study (for instance, the number of exams passed with honours, experience abroad, internship etc.).

Students enrolled at Politecnico for the first time starting from a.y. 2022/2023 who pass their first-year courses and the core courses offered in Year 2 (Mathematical Analysis 2 and Physics 2) by the end of the examination session which immediately follows the semester of first course attendance will get a bonus (0.5 points for each exam) that will be added to the final grade, up to a maximum of 4 points.

Honours may be awarded upon achieving a final score of 110.51, at the discretion of the Committee and by a qualified majority (i.e. at least two-thirds of the committee members).

The Graduation Examining Committee must evaluate the student's overall educational path, assessing also his/her cultural maturity and ability for independent intellectual development.

More Information and Deadlines:

- Student Regulations
- Student Guide

Diploma Supplement:

In compliance with article 11, paragraph 8, of Ministerial Decrees No. 509/1999 and 270/2004. Politecnico di Torino issues the Diploma Supplement, a document that can attached to a higher education qualification. It is designed to improve the transparency of international qualifications, as it provides the description of the curriculum successfully completed by the student. This certificate follows the European model developed by the European Commission, the Council of Europe and UNESCO – CEPES: it is issued in two languages (Italian-English) and it is composed of approximately 10 pages.

More information at: https://www.polito.it/en/education/applying-studying-graduating/academic-experience/certificates-and-other-documents

Art. 6 – References

6.1 Student Regulations

The Student Regulations define the rights and responsibilities of students and set out the administrative and disciplinary rules that all students enrolled in a degree programme or in a single learning activity at Politecnico must abide by.

6.2 Other Regulations

Particular aspects of students' academic progress are governed by specific Regulations or Calls for Applications published on its website.
In particular:

- The Tuition Fee Regulations specify the annual tuition fees that students must pay. The procedure for requesting a tuition fee reduction is explained in a dedicated guide.
- The University Regulations on Funds for Student Mobility Abroad outline the principles and rules for awarding and disbursing mobility grants. Standard procedures apply to all types of mobility programmes with unified Calls for Applications published twice a year at https://www.polito.it/en/education/applying-studying-graduating/studying-abroad
- The Code of Ethical Conduct also applies to students.