Politecnico di Torino

ACADEMIC REGULATIONS

Bachelor's degree programme
in
ELECTRICAL ENGINNERING

Department of Energy

Collegio di Ingegneria Elettrica ed Energetica

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.

SUMMARY

Art. 1 - Specific learning objectives and career prospects

1.1 Specific Learning Objectives

The Bachelor's degree programme in Electrical Engineering aims to train professionals in the field of industrial engineering, with a specific focus on knowledge and competencies related to electrical components and systems.
Building on an interdisciplinary foundation, the programme provides solid specialized preparation in the fundamentals of electrical engineering, electrical machines, electromechanical applications, electric drives, power electronics, electrical measurements, electrical safety, and electrical systems.

1.2 Career prospects

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

Professional Profile	Main functions and competencies
Free lance Professional (upon passing the State examination after graduation, Section B)	Functions: Graduates in Electrical Engineering who pass the State examination and register in Section B of the Professional Register of Engineers may work in companies, enterprises, private organizations, and public administrations, or independently. Registration in the Professional Register entitles them to sign design or verification documents and to assume responsibility for their content. The professional profile of engineers is defined in Presidential Decree No. 328 of 5 June 2001, *"Amendments and additions to the regulations on the requirements for admission to the State examination and on the related tests for the practice of certain professions, as well as on the regulations of the related professional orders"*, published in the *Official Gazette*, No. 190 of 17 August 2001, Ordinary Supplement. In particular, graduates in Electrical Engineering are primarily employed in the field of industrial engineering. Competencies: Competencies are defined in Art. 46, paragraph 3, of Presidential Decree No. 328 of 5 June 2001, and include: • activities based on the application of sciences, contributing to and collaborating in the design, construction supervision, estimation, and testing of machines and systems, including public works; • direct and instrumented surveys of technical parameters related to machines and systems; • activities involving the use of standardized methodologies, such as the design, supervision, and testing of individual components or elements of machines, systems, and installations, as well as simple and repetitive systems and processes. Key competencies include applying safety principles and cost-conscious design, knowledge of the characteristics of components and systems, the ability to prepare technical documents, bills of quantities, and budgets, conducting surveys, calculations and measurements, preparing expert reports, and communicating with clients, technical operators, and institutions. Potential employers: Opportunities for electrical engineers are numerous and highly diversified. Within professional activities involving private or public companies and organizations, electrical engineers can perform various roles in the fields of electrical installations and industrial automation.

Specialist in operation and maintenance of electrical components, machines, drives and systems	Functions: Responsible for the technical service and for maintenance services. Competencies: • Manages system solutions involving the use of electrical energy; • Verifies compliance with safety procedures in processes; • Performs tests to verify the functionality of components and systems; interprets and verifies compliance with regulatory requirements; • Prepares accurate and concise technical reports; • Manages interactions between electrical components and other technological or system components. Potential employers: Private companies or public organizations employing electrical components and systems. Companies, enterprises, or public and private entities operating in the industrial, transportation, and civil infrastructure sectors.
Technical Officer or Specialist in Technical Offices and Laboratories	Functions: Technical officer. Manager of a technical office. Manager of a technology laboratory. Competencies: • Prepares technical and economic documentation; • Conducts inspections on machinery and systems as required by legislation and regulations; • Performs tests and measurements on components and systems; • Drafts or coordinates the preparation of technical reports and testing certifications; defines solutions for the rational use of energy and coordinates their implementation; • Identifies measures to improve energy efficiency; interacts with institutional and professional figures, energy and service providers, and industry operators. Potential employers: Private or public companies or organizations with technical offices and laboratories.
Plant Design Assistant	Functions Design assistant. Technical services officer. Safety officer. Industrial consultant. Competencies: • Prepares design documentation for simple projects; interprets legislation, regulations, and technical catalogues; • Provides support for design, product testing, and the definition of work and safety plans; • Ensures compliance with electrical safety principles; conducts surveys, calculations, and measurements; • Performs measurements on machines and systems, and testing verifications; participates in a work group discussing technical solutions; defines maintenance plans; • Assists in preparing project budgets, bills of quantities, and cost estimates; • Explains the characteristics of technical and plant solutions to people outside the electrical sector; • Interacts with the activity manager, product or service suppliers, and, where applicable, with clients. Potential employers: Companies involved in the production and distribution of electrical energy, professional offices for electrical system design and multidisciplinary integrated design, and companies providing industrial services and consultancy.

Technical-Commercial Services Officer	Functions: Graduates in Electrical Engineering operate in one of the following functions: • Commercial and Marketing Area: expert in technical-commercial products and services, sales officer; • User Services Area: provides technical support to clients during the selection of products and application solutions, industrial consultancy for system installations. Competencies: • Markets electrical machines and components, explaining their features and modes of use; • Presents to clients the characteristics of traditional technical and plant solutions, including those with high technological content; • Assists clients in identifying the technical solutions to adopt; prepares technical documentation containing specifications and usage instructions, as well as documentation concerning product or production system quality; • Supports clients during the phases of purchase, installation, use, and maintenance of products and related systems ensuring their safety and functionality; • Interacts with commercial operators and with authorities responsible for granting approvals and conducting tests, inspections, and verifications. Potential employers: Companies producing and selling electrical machines and components; technical-commercial consultancy firms serving clients.
Preparation for further studies	**Knowledge required for further studies**
Graduates in Electrical Engineering with an aptitude for advanced studies may continue their education by enrolling in a Master's degree programme or pursuing post-graduate specialist paths.	They are expected to have: • an in-depth theoretical knowledge of mathematics, physics, mechanics, and electrical engineering; • a solid understanding of the fundamentals of electrical machines, electric drives, and electrical systems; • adequate language skills and the ability to formulate problems in mathematical terms; • analytical and synthetic skills, communication abilities, the capacity to convey knowledge, and a critical attitude.

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/), a graduate from this Bachelor's degree programme can work as:

ISTAT code	Description
3.1.3.3.0	Elettrotecnici

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 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 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), 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.

Students with a non-Italian educational qualification who intend to enrol in the programme, which is delivered entirely in Italian, must hold, at the time of enrolment, a certificate of Italian language proficiency at level B2, 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 degree programme emphasizes the methodological and operational aspects that allow graduates to competently enter the field of electrical engineering and to communicate, using appropriate technical language and basic concepts, with other professionals in the industrial and information engineering sectors. The cultural and methodological competencies acquired by graduates ensure both a rapid entry into the workforce and adequate preparation for further studies.

The programme is unified and designed to develop a professional capable of understanding the impact of engineering solutions applied to the electrical field in the current context, providing the cognitive tools necessary for the continuous updating of knowledge and enabling active participation in the process of technological innovation.

The programme is organized into interconnected thematic areas:

- Scientific foundation: includes the scientific fundamentals and methodological-operational aspects of mathematics and basic sciences (physics and chemistry) as applied to engineering. These courses are positioned in the first half of the programme (first year and first semester of the second year). Additionally, complex analysis is introduced in the second year, which is essential for the subsequent study of many topics in electrical engineering.
- Engineering foundation: covers the typical content of industrial engineering, enabling students to identify, formulate, and solve problems using updated methods, techniques, and tools. Knowledge and competencies are provided in technical industrial drawing, materials science and technology, structural mechanics, and mechanical engineering. These courses are offered in the second year.
- Core and related courses in Electrical Engineering: basic electrical engineering is treated in greater depth than in other industrial engineering programmes. Core courses address specific problems in electrical engineering (components, systems, and installations). Related courses cover concepts from statistics, the information sector (electronics and automation), and the thermal sector (applied thermodynamics and heat transfer) as applied in electrical engineering. These courses are positioned in the second and third years.
- Additional educational activities: include basic IT training. Students also have the opportunity to select additional courses offered by the University to complete and deepen their preparation, including topics in economics, humanities, and emerging areas of electrical engineering or other engineering sectors.

To obtain the degree, students must also demonstrate proficiency in English at the B2 level, according to the Common European Framework of Reference for Languages (CEFR). Completion of the programme requires passing a final examination, consisting of a work independently carried out by the student, accompanied by the preparation of a final report.

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=32&p_cds=549

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_aiq_2023.visualizza?sducds=32549&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

The final examination is an individual educational opportunity that completes the programme, without requiring particular originality. It involves the preparation of an independent written report (Final Project) in which the student demonstrates the analysis of a specific problem related to the courses attended, the review of relevant available documentation, and the performance of basic evaluations.

The Final Project may also be written in English.

The Final Project corresponds to a conventional workload of approximately 75 hours, equivalent to 3 ECTS credits.

The candidate must produce a written report with a maximum length of 30 pages. To verify the student's personal contribution, the content of the Final Project may be discussed with the support of audiovisual materials. The Supervisor is considered responsible for ensuring the proper conduct of the activity.

Students must submit their request online through the dedicated procedure available in their personal page on the Teaching Portal, in the section "Degree and Final Examination", complying with the deadlines for the relevant session published in the Student Guide – Thematic Calendar section.

The final grade is determined by the Graduation Examining Committee, which evaluates the overall average grade 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.

To this average, the committee may normally add up to 5 additional points, based on:

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

Students enrolled at Politecnico for the first time starting from a.y. 2022/2023 (and following aa.yy.) 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 (*cum laude)* may be awarded upon achieving a score of 110, at the discretion of the committee and with a qualified majority, i.e., at least 2/3 of the committee members.

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 be 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.