Politecnico di Torino

ACADEMIC REGULATIONS

Bachelor's degree programme
in
CHEMICAL AND FOOD ENGINEERING

Department of Applied Science and Technology
Collegio di Ingegneria Chimica e dei Materiali

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 specific learning objectives of the Bachelor's degree programme in Chemical and Food Engineering include the recommendations of the European Federation of Chemical Engineering. They include:

- knowledge of the general principles of process engineering: energy, mass, and momentum balances; chemical and physical equilibria; kinetics; and chemistry and physics (transport of matter, heat, and momentum);
- knowledge of measurement methods and general concepts of process control for managing production processes;
- basic knowledge of safety and environmental issues;
- ability to formulate problems within the scope of process engineering in a general manner, reducing them to fundamental physic-chemical principles;
- ability to select analysis, modelling, and simulation methods for simpler problems;
- basic knowledge of design methods and the ability to apply them;
- ability to organize, perform, and describe a laboratory experiment or simple industrial test in the field of process engineering;
- ability to present the results of one's work, both in written and oral form, in a structured way and to communicate effectively.

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**
Chemical Engineer – Junior	Functions: A graduate in Chemical and Food Engineering is capable of operating in the operational management of plants, systems, processes, or services in sectors related to the transformation of matter. In this context, the chemical and food engineer can: • participate in the management and operation of production processes in the chemical, petrochemical, pharmaceutical, and food sectors; • participate in the management and operation of plants for the treatment of solid, liquid, or gaseous waste; • participate in the management and operation of plants for energy production from fuels. The graduate has the knowledge and methodological preparation for the design of operational units and basic equipment for the chemical and process industry, and therefore can: • collaborate in defining production and transformation processes and in the design of plants for the process industry and energy production; • perform modelling and design of networks for fluid transport, heat exchangers, reactors, concentrators, separators, and other general process industry equipment; • collaborate in the collection and analysis of data for process and plant safety in raw material transformation. Within the industrial sector, the chemical and food engineer may also perform technical-commercial activities, assisting clients in all phases from specification definition to sales and post-sales services, concerning chemical products—especially those relevant to the food industry—as well as equipment, plants, or services. They are capable of organizing and performing presentations and demonstrations of systems and apparatuses, either at trade fairs or directly at clients' sites.

	Finally, the graduate may work in research and development laboratories, contributing to and supervising their management and organization, applying innovation skills, distributing work within the technical team, selecting and purchasing reagents and laboratory materials, managing project archives, and maintaining instrumentation. Competencies: Basic competencies allow adaptability to the function and application fields. Specifically: • A junior process engineer will particularly leverage skills acquired in chemical engineering courses—thermodynamics of multiphase and reactive systems, chemical and physical equilibria, transport phenomena—especially regarding the management of reactors, conventional separation units, fluid transport lines, and chemical production processes. Skills related to the evaluation of industrial process and plant safety and product quality will also be applied. • A junior designer will use the same competencies acquired from general and chemical engineering courses to design reactors, conventional separation units, fluid transport lines, and chemical production plants. Fundamental scientific principles of chemical engineering will be extensively applied, along with competencies in assessing process and plant safety and product quality. In addition, client interaction—whether private, corporate, or institutional—requires both technical expertise and communication skills for managing the sales process. Chemical and food engineers engaged in commercialization possess solid knowledge of plant and equipment technologies, product properties, and aspects related to reliability, maintenance, performance, and energy consumption. Finally, the competencies of a laboratory manager encompass all phases of design, prototyping, and small-scale production of a product/process, as well as analytical techniques and associated instrumentation considered both theoretically and practically in laboratory activities. Engineers in this role understand product design and production technologies; can select raw materials and processes to achieve the best cost-performance compromise; are skilled in using laboratory instrumentation and simulation software; and have process control skills to set up and manage laboratory and production equipment. Potential employers: Typical areas include the process industry (chemical, petrochemical, food, pharmaceutical, etc.), across diverse economic sectors such as energy production and agriculture, as well as design firms and public and private organizations. Process management skills are also sought in other industrial fields, often related to waste treatment, fuel use, and fluid handling. Additional professional opportunities include research and development laboratories, testing, measurement and characterization centres, public and private companies, and research institutions.
Preparation for further studies	**Required knowledge for admission to the Master's degree programme:**
Master's degree programmes in the field of Industrial Engineering	For the continuation of studies in related Master's degree programmes, the graduate: • must possess solid theoretical knowledge, although oriented toward the engineering profession, in mathematics, physics, and chemistry, as well as adequate language skills; • must have basic knowledge of industrial engineering, including foundational skills in machinery and thermal systems, electrical engineering, materials science, transport phenomena, thermodynamics, chemistry, and industrial process plant engineering; • must have the ability to enhance professional competencies through continuous learning; in particular, they should be able to identify missing information needed to solve specific problems and know the methods to acquire such information; • must be able to address innovative and highly technological or methodological challenges and carry out design activities using software or automated systems, while understanding the underlying physical principles; • must be capable of communicating technical information, directly or through appropriate documents and tools, even to individuals outside the specific fields of the process industry.

Master's degree programme in Chemical and Sustainable Processes Engineering or other Master's degree programmes in the field of Chemical Engineering	For the continuation of studies in Master's degree programmes in chemical engineering, the graduate: • must possess solid theoretical knowledge, although oriented toward the engineering profession, in mathematics, physics, and chemistry, with particular attention to the contents of organic and biological chemistry; • must have adequate language skills to operate in an international context, where textbooks, manuals, and chemical-physical data are often provided in English; • must have a solid foundation in chemical engineering and the ability to enhance professional competencies through continuous learning; in particular, they should know the fundamentals of all core disciplines in the sector: transport phenomena, thermodynamics, reactor engineering, industrial chemistry, and chemical plant engineering; • must be able to deepen theoretical and methodological aspects by analysing and applying the methodologies that characterize chemical engineering; • must be able to identify missing information required to solve specific problems and know the methods to acquire such information; • must have the ability to address innovative and highly technological or methodological challenges and carry out design activities, including complex projects; to this end, they must be able to work independently and manage projects; • must be able to communicate technical information, directly or through appropriate documents and tools.

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
3.1.4.1.2	Tecnici della conduzione e del controllo di impianti chimici
3.1.5.4.2	Tecnici della produzione alimentare

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

In the three-year of the degree programme, students move from an initial period in which they primarily build foundational knowledge—first scientific, then engineering-related—toward the development of more specific skills, which occurs mainly through courses in the second and third years. It should be noted that, at every level, knowledge acquisition is always accompanied by practical exercises illustrating the concrete application of the theoretical elements studied.

In particular, the first year largely mirrors that of other Industrial Engineering degree programs, with a specific focus on organic chemistry relevant to this program.

In the following years, both foundational engineering disciplines (such as structural mechanics, fluid machinery, and electrical engineering) and subjects directly related to chemical engineering are studied in greater depth. In the second year, the subjects include molecular biology and microbiology, thermodynamics, transport phenomena, chemical reaction kinetics (including biological and enzymatic kinetics, with attention to those relevant for the food industry), chemical reactors, and separation processes.

The third year focuses on industrial chemistry (including inorganic industrial chemistry and principles of catalysis), process control, and industrial process safety (covering aspects of workplace hygiene, fire and explosion hazards, and uncontrolled chemical reactor events), as well as chemical and food industry plant engineering. In addition, courses more characteristic of industrial engineering (fluid machinery, electrical engineering) are included, tailored closely to the interests of chemical and food engineers.

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=481

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=32481&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 represents an individual educational opportunity that completes the degree programme. It requires an in-depth study of one of the topics in chemical and food engineering covered in the programme's courses, summarized in a brief oral presentation to be prepared in the weeks preceding the graduation session.

The topic for the Final Project will be assigned by the teaching staff, proposing at least two subjects from different thematic areas for each student, from which the student can choose. The candidate is expected to prepare a concise technical-scientific presentation and to present the work publicly.

For students participating in student projects relevant to chemical engineering, it is possible to base the presentation on their project experience. Similarly, students who have completed an internship may present a report on their professional experience.

Students must submit their request online through the dedicated procedure available on their personal page of the Teaching Portal, under the section "Graduation and Final Examination," observing the deadlines for the relevant graduation session as 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 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.).
- the evaluation of the Final Project

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.