Politecnico di Torino

ACADEMIC REGULATIONS

Bachelor's degree programme
in
MATHEMATICS FOR ENGINEERING

Department of Mathematical Sciences

Collegio di Ingegneria Matematica

Academic Year **2026/2027**

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 3

1.1 Specific Learning Objectives 3

1.2 Career prospects 3

1.3 Professional profiles (ISTAT codes) 5

Art. 2 - Admission requirements 6

Art. 3 - Programme curriculum 7

3.1 Programme overview 7

3.2 Organization of educational activities 7

Art. 4 - Student career 8

Art. 5 – Final Examination 9

Art. 6 - References 11

6.1 Student Regulations 11

6.2 Other Regulations 11

Annex 1 – Tabella delle Attività Formative 12

Art. 1 - Specific learning objectives and career prospects

1.1 Specific Learning Objectives

Through the integrated use of the knowledge and skills acquired in the various thematic areas, graduates in Mathematics for Engineering are able to deduce, in different application contexts, the mathematical model that describes a specific problem, identify the most appropriate numerical and/or statistical method for simulation and/or data analysis, and provide a representation of the results that is understandable even to individuals not familiar with the underlying mathematical techniques.
Attention to optimization and operations research also provides the tools to apply mathematical methods that enable obtaining optimized solutions for engineering and decision-making problems.
The educational objectives also include an adequate understanding of the scientific method and mastery of physical and computational methodologies, the ability to construct rigorous proofs based on known demonstrations, and the ability to translate problems formulated in everyday language into mathematical terms and leverage them to propose appropriate solutions.

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
Applied Mathematician	Functions: The applied mathematician is a professional capable of providing appropriate mathematical and statistical treatment to engineering problems, using methodologies offered, in general, by various branches of mathematics and, in particular, by the modelling, analytical, and numerical treatment of differential equations. The main functions performed by an applied mathematician include: • identifying the most suitable mathematical model for the physical phenomenon or technological process of interest, based on the analysis and understanding of the specific problem; • analysing the mathematical model to solve the application problem of interest; • simulating and optimising the mathematical model through numerical methodologies and the use or development of appropriate scientific software. Competencies: The applied mathematician combines basic mathematical, scientific, computer science, and engineering knowledge. In particular, they relate and integrate knowledge in mathematical analysis, geometry, linear algebra, numerical calculation, programming and scientific computing, mathematical physics, computer science, probability, and statistics. This enables them to: • analyse and compare different mathematical models for the problem of interest, evaluating their accuracy, predictive capability, and complexity; • use or develop scientific software for the numerical simulation of mathematical models; • propose and implement solutions to optimisation problems of such models. Potential employers: • Industrial manufacturing companies • IT companies • Engineering companies specialising in simulation • Engineering consultancy firms • Research and development departments of large industrial organisations • Logistics departments of industrial organisations

Statistician	Functions: The statistician is a researcher who can assist other professionals (engineers, physicians, biologists, economists) in conducting and analysing laboratory experiments, observational studies, and data set analyses. They are a valuable asset for managing an industrial or commercial enterprise, or for research and development departments, due to their ability to collect, analyse, and extract information from data. The main functions performed by a statistician include: • managing and organising data sets; • analysing data sets to draw descriptive or inferential conclusions useful for the enterprise; • constructing necessary databases through planned experiments, surveys, market research, or cyberspace navigation. Competencies: The statistician combines basic knowledge in mathematics, statistics, computer science, and engineering. In particular, they integrate knowledge in probability, statistics, mathematical analysis, geometry, linear algebra, numerical calculation, scientific computing, and computer science. This enables them to: • analyse and compare different mathematical-statistical models for the data set of interest, evaluating their accuracy, predictive capability, and complexity; • use or develop scientific software for analysis, statistical inference, machine learning, and visualisation of data sets; • acquire and organise databases useful for solving the specific problem. Potential employers: • Industrial manufacturing companies • Banks and financial institutions • Insurance companies • Consultancy firms • Data analysis and logistics departments
Preparation for further studies	**Knowledge required for continuing studies**
Master's degree programmes or Postgraduate Specialised Programmes	• Attitude toward advanced studies: readiness and motivation for engaging in high-level academic work. • In-depth knowledge of key methodologies: applied mathematics, complex and functional analysis, numerical methods, probability, statistics, and programming languages. • Foundations in basic engineering disciplines: including at least one of the following: Databases, Quantum Physics, or Mathematics for Artificial Intelligence. • Skills in formalising applied problems in mathematical or statistical terms. • Language proficiency: ability to communicate effectively in written and spoken form. • Analytical and synthetic capabilities: aptitude for understanding complex problems and deriving coherent solutions. • Communication skills: ability to explain complex concepts clearly to both specialists and non-specialists. • Interdisciplinary collaboration: ability to establish dialogue across disciplines to solve problems using mathematical tools. • Mental agility and critical thinking. • Knowledge transfer: ability to transmit acquired knowledge effectively.

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
2.1.1.3.1	Matematici
3.1.1.3.0	Tecnici statistici
3.1.2.2.0	Tecnici esperti in applicazioni

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 Bachelor's degree programme is structured as a single coherent curriculum aimed at providing students with solid mathematical and statistical skills, combined with knowledge in physics, engineering, and computer science. This knowledge equips graduates in Mathematics for Engineering to effectively engage in the technological and scientific innovation process in the professional context.

This strong interdisciplinary orientation is emphasised through the interconnection of the following three thematic areas:

- Scientific foundation: covering the scientific fundamentals and methodological-operational aspects of mathematics and basic sciences (physics, chemistry, and computer science). These courses are offered in the first half of the programme (first year and first semester of the second year) and are common to other Engineering degree programmes.
- Mathematical and computational methods: presented with a particular focus on their applications to engineering problems. The curriculum introduces scientific computing methodologies, techniques for formulating mathematical models and their analytical study, issues related to determinism and stochasticity, and statistical methods for data analysis and interpretation.
- Physics and engineering foundation: representing the essential background on which to build mathematical knowledge. These courses provide students with the know-how necessary to understand engineering problems and translate them into mathematical and numerical terms. Students are offered considerable flexibility in selecting engineering subjects to deepen through elective courses.

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=570

The list of the Scientific Disciplinary Fields (Settori Scientifico Disciplinari) for each activity (specific subjects and complementary subjects) is available in Annex 1 to the present Regulations.

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 constitutes an individual learning opportunity to complete the programme and does not necessarily require original contributions.
It consists of the preparation of a written report (Final Project) and its oral presentation. The examination requires the student to carry out an independent individual project in which they analyse a specific mathematical-statistical or interdisciplinary problem, through research and study of relevant bibliographic sources and the execution of basic evaluations.
The workload for the preparation of the Final Project is approximately 75 hours, corresponding to 3 ECTS credits.

Students must submit their application online via the designated procedure available on their personal page in the teaching portal, under the section "Degree and Final Examination", observing the deadlines for the session of interest as published in the Student Guide – Thematic Calendar Section.

By the deadline indicated in the Student Guide for submitting the graduation application, the student must obtain the approval of the Final Project by the Final Examination Supervisor. Such approval, together with the successful completion of all exams, will enable the student to participate in the relevant graduation session.

Candidates who have obtained the supervisor's approval may attend the final examination according to the schedule of presentations and proclamations set for that session.

The candidate presents the Final Project to a Committee whose members come from different scientific-disciplinary sectors, allowing the student to demonstrate the ability to describe a problem and the corresponding solution process to non-specialists in the field.

At the student's discretion, the Final Project and the presentation may be prepared and delivered in English.

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 and its presentation;
- other information about the student's course of study (for instance, the number of exams passed with honours).

Starting from 2022/23 cohort (students with first enrolment at Politecnico starting from a.y. 2022/2023):

You may get a 0.5 points bonus that will be added to your final examination score (final grade) for:

- each Year 1 exam that you will pass on time (excluding the English language exam);
- for each core exam offered in the first semester of Year 2 that you will pass on time.

You will get this bonus if you pass:

- your Year 1 exams delivered in first semester: by the end of the Winter examination session of your year of first enrolment (Year 1)
- your Year 1 exams delivered in second semester: by the end of the Summer examination session of your year of first enrolment (Year 1)
- your Year 2 core exams delivered in first semester: by the end of the Winter examination session of your second year of enrolment (Year 2)

This bonus (max 4 points) can be earned exclusively by the students who enrol for the first time in the university system (i.e. students who have never studied at any university before). Please note that forfeited students, withdrawn students, credit transfer students cannot get this bonus.

Please check the Student Guide to find out about the last examination session for passing your exams and getting the bonus.

Honours (*cum laude)* may be awarded upon achieving a score of 111, 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.

Annex 1 – Tabella delle Attività Formative

Attività	Ambito Disciplinare	Settore	SSD corrisp	cfu min	cfu max
Attività di base	Formazione Fisica di base	PHYS-01/A - Fisica sperimentale delle interazioni fondamentali e applicazioni	FIS/01	12	20
		PHYS-02/A - Fisica teorica delle interazioni fondamentali, modelli, metodi matematici e applicazioni	FIS/02		
		PHYS-03/A - Fisica sperimentale della materia e applicazioni	FIS/01 - FIS/03		
		PHYS-04/A - Fisica teorica della materia, modelli, metodi matematici e applicazioni	FIS/02 - FIS/03		
	Formazione informatica di base	IINF-05/A - Sistemi di elaborazione delle informazioni	ING-INF/05	8	14
	Formazione matematica di base	MATH-02/A - Algebra	MAT/02	30	46
		MATH-02/B - Geometria	MAT/03		
		MATH-03/A - Analisi matematica	MAT/05		
Attività caratterizzanti	Formazione Matematica Modellistico-Computazionale	MATH-03/B - Probabilità e statistica matematica	MAT/06	20	38
		MATH-04/A - Fisica matematica	MAT/07		
		MATH-05/A - Analisi numerica	MAT/08		
	Formazione Matematica Teorica	MATH-03/A - Analisi matematica	MAT/05	24	38
Attività affini	Attivita formative affini o integrative	CEAR-06/A - Scienza delle costruzioni	ICAR/08	18	36
		CHEM-06/A - Fondamenti chimici delle tecnologie	CHIM/07		
		IEGE-01/A - Ingegneria economico- gestionale	ING-IND/35		
		IIET-01/A - Elettrotecnica	ING-IND/31		
		IIND-01/F - Fluidodinamica	ING-IND/06		
		IIND-03/A - Progettazione meccanica e costruzione di macchine	ING-IND/14		
		IIND-07/A - Fisica tecnica industriale	ING-IND/10		
		IIND-07/B - Fisica tecnica ambientale	ING-IND/11		
		IINF-03/A - Telecomunicazioni	ING-INF/03		
		IINF-04/A - Automatica	ING-INF/04		
		IINF-05/A - Sistemi di elaborazione delle informazioni	ING-INF/05		
		MATH-06/A - Ricerca operativa	MAT/09		
		STAT-01/A - Statistica	SECS-S/01		
Altre attività	A scelta dello studente	-		12	18
	Per la conoscenza di almeno una lingua straniera	-		3	3
	Per la prova finale	-		3	3
	Abilita informatiche e telematiche	-		-	-
	Altre conoscenze utili per l'inserimento nel mondo del lavoro	-		-	-
	Tirocini formativi e di orientamento	-		0	8
	Ulteriori conoscenze linguistiche	-		-	-
	Per stages e tirocini presso imprese, enti pubblici o privati, ordini professionali	-		0	8