ACADEMIC REGULATIONS
Master's degree programme
in
ICT ENGINEERING FOR SMART SOCIETIES

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

Academic Year **2025/2026**

SUMMARY

Art. 1 – Specific learning objectives and career prospects

1.1 Specific learning objectives

The Master's degree programme in ICT Engineering for Smart Societies is highly multidisciplinary. It focuses on research and design, providing analytical methodologies for complex systems based on ICT technologies across various application domains. The programme prepares students to be hired by competitive companies, high-level industrial or public research centres, or to pursue a doctoral degree. All courses are English-taught to facilitate employment in international companies and/or research centres.

The Master's degree programme in ICT Engineering for Smart Societies emphasises methodological content over descriptive knowledge- It trains specialists with solid, long-lasting skills that enable both immediate entry into the job market and the foundations for continuous professional development.

Through a highly interdisciplinary approach, the programme equips students with methodological competencies in telecommunications, computer science and other areas of information engineering. These skills are essential for fostering innovation in traditionally non-ICT fields, such as energy production and distribution, healthcare and patient care, environmental protection, transport systems, and the design of innovative cities and buildings. Graduates can work in research, design, and development of applications for public health diagnostics, smart energy distribution networks, transport system control and planning, sustainable building design, and environmental monitoring and control.

1.2 Career prospects

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

Professional profile	Main functions and competencies
Specialist in telematics services design and development - engineer	Functions: The specialist in telematics services design and development is involved in the design, development and production phases of telematics systems and devices within a company. Design and development activities may typically be carried out in the following fields: 1. Design and development of telematics systems/devices for applications related to energy production and distribution, smart homes, transport, healthcare and telemedicine and environmental protection. 2. Development of innovative ICT and telematics applications to support efficient energy production and distribution, healthcare and telemedicine, environmental protection, transport optimization, and urban planning. These activities include defining system architecture requirements, selecting hardware and software components, specifying and developing new components to be integrated. Competencies: *Entry-level professional skills:* At the beginning of their professional career, engineers should be able to: • Read and understand design specifications • Use network protocols and architectures, and programming languages • Apply modelling techniques commonly used in the field (e.g. stochastic processes and Markov chains, queuing theory, optimization techniques, big data analytics, image processing techniques) • Stay up to date on the evolution of relevant application domains • Participate in the design of equipment, systems, and hardware/software components • Apply criteria to test components, systems, and subsystems • Contribute to the management and coordination of project teams

	Senior-level professional skills: In a lifelong learning perspective, senior engineers in advanced design and development must continuously devise innovative solutions for telematics systems and services to meet emerging user needs. Senior professionals are expected to lead and coordinate project teams, leveraging the experience and maturity acquired over the course of their career. Achieving this level requires integrating the academic foundations with the skills acquired through work experience. Potential employers: These engineers are mainly employed by companies that develop and/or produce telematics applications and devices, both in Italy and abroad. They may also work for companies that develop telematics services such as cloud computing applications, big data analytics, telemedicine solutions, smart energy distribution, home automation and environmental monitoring.
Research	Functions: Researchers work in R&D teams at: • ICT device manufacturers, including hardware and firmware developers for applications in energy production and distribution, healthcare and telemedicine, environmental monitoring, home automation and urban planning • energy distribution networks, information networks, and transport systems, large hospitals, and companies in the healthcare, environmental, and home automation sectors • Universities and public research centres Competencies: *Entry-level professional skills:* Graduates should be able to: • Contribute original ideas and innovation to research projects • Draft research proposals • Coordinate research activities and specific tasks • Write technical reports • Manage and coordinate human resources • Read and analyse technical documents and reports *Senior-level professional skills:* Over the course of their career, researchers contribute to the advancement of knowledge for future-oriented societies through publications and patents. They must build a strong reputation in the research community and progressively lead small research teams, guiding junior researchers and shaping research directions. Potential employers: • R&D departments of large companies operating in the fields of healthcare, environmental protection, energy, transport and innovative urban/building design • Universities in Italy and abroad
Freelance ict consultant for non-ict application domains	Functions: Graduates can work as consultants for companies, public authorities, and other organizations, even when the organization's field of activity is not related to energy distribution, healthcare and telemedicine, environmental protection, or home automation. Consultants contribute to the definition of national and international standards, regulations and patents. Competencies: *Entry-level professional skills:* Consultants must be familiar with national and international standards and be capable of managing all phases of specification definition, design, prototyping, and production of hardware/software systems. They must be able to: • Select components based on the best cost-performance trade-off for a project • Propose the development of new components with requirements that meet the specifications • Draft technical specifications and liaise with clients and designers to define needs and specifications

- Often engage in teaching and training activities and prepare technical evaluations for courts and companies.

Senior-level professional skills:
At the senior level, with a perspective of lifelong learning, freelance consultants must keep up with the rapid evolution of network architectures and their applications in data management. They must also be able to coordinate small-to-medium-sized teams of engineers and technicians.
Achieving this professional level requires integrating the foundational knowledge gained during academic training with additional skills acquired through work experience.

Potential employers:
Freelance consultants typically work independently or are hired by consulting companies.

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 Master's degree programme can work as:

ISTAT code	Description
2.2.1.4.3	Ingegneri in telecomunicazioni
2.6.2.3.2	Ricercatori e tecnici laureati nelle scienze ingegneristiche industriali e dell'informazione

Art. 2 – Admission requirements

Italian regulations on enrolment in Master's degree programmes require Italian universities to check that applicants meet the following requirements:
- have a **three-year Bachelor's degree or university diploma**, or **other educational qualification obtained outside Italy** and recognized as suitable for admission;
- meet **specific curricular requirements**;
- have an **academic performance considered suitable** for admission;

CURRICULAR REQUIREMENTS

As far as curricular requirements are concerned, applicants must have a Bachelor's degree or a three-year university diploma, or an educational qualification obtained outside Italy and recognized as suitable for admission. In addition, they must have gained specific knowledge and competencies during their previous academic path (credits in specific Scientific Disciplinary Fields).

In particular, applicants must have earned:
- minimum 40 credits earned in the following core Scientific Disciplinary Fields (settori scientifico-disciplinari): FIS/01, FIS/03, INF/01, ING-INF/05, MAT/02, MAT/03, MAT/05, MAT/06, MAT/08
- minimum 60 credits earned in the following specific Scientific Disciplinary Fields (settori scientifico-disciplinari):
- CHIM/07, INF/01, ING-IND/10, ING-IND/13, ING-IND/14, ING-IND/31, ING-IND/33, ING-INF/01, ING- INF/02, ING-INF/03, ING-INF/04, ING-INF/05, ING-INF/06, ING-INF/07, MAT/05, MAT/06 MAT/08, MAT/09, SECS-S/01

The credits of the Scientific Disciplinary Fields found both in the first group and in the second group are primarily counted for the first group. The remaining credits are counted for the second group. Therefore, the credits of a course can be counted partly to reach the minimum number of credits of both groups.

Applicants who lack less than 10 credits can be admitted to the programme by the Academic Advisor of the degree programme. For applicants who lack more than 10 credits, the evaluation will be subject to the final approval of the Coordinator or the Vice coordinator of the degree programme.

Applicants who do not meet the curricular requirements must make up for their unfulfilled curricular requirements (missing credits) before enrolment, by means of:
- **enrolment in single courses in order to make up for unfulfilled curricular requirements**: this is possible for students who need to earn up to a maximum of 60 credits. Students who enrol in single courses for this reason are allowed to include in their Personal Study Plan exclusively the courses assigned by the evaluator.
  or else,
- **credit transfer at Bachelor's level**: this is possible for students who need to earn more than 60 credits. In this case, students need to enrol in the Bachelor's degree programme that offers the credits in the specific Scientific Disciplinary Fields (core subjects and commentary subjects) required for admission to this Master's degree programme.

SUITABLE ACADEMIC PERFORMANCE

Applicants must have a suitable academic performance and an English language certificate (B2 level or above, as defined by the Common European Framework of Reference for Languages: Learning, Teaching, Assessment - CEFR).

The academic performance will be assessed as follows.

1) Applicants from Politecnico di Torino

a) applicants can be admitted to the programme if they earned their Bachelor's degree in:
- 4 years or less (1) - no exam average grade required
- between 4 and 5 years (1) –exam weighted average grade required (2): ≥21/30
- more than 5 years– exam weighted average grade required (2): ≥ 24/30

b) admissions by merit-based evaluation of the Evaluation Committee

Applicants who do not have the above-mentioned average grade can take an admission test if they earned their Bachelor's degree in:

- between 4 and 5 years (1) –exam weighted average grade required (2): < 21/30
- more than 5 years– exam weighted average grade required (2): > 21/30 and < 24/30

provided that during their Bachelor's path the weighted average grade of the exams belonging to the Scientific Disciplinary Fields (settori scientifico-disciplinari) ING-INF/03 e ING-INF/05 is ≥ 24/30

The details of the admission test are available in the section below "Merit-based evaluation for applicants from Politecnico di Torino and from other Italian universities".

The weighted average grade is calculated on all accrued course credits (graded on a scale of 30) counting towards the achievement of the Bachelor's degree, after having subtracted the worst 28 credits.

The duration of the Bachelor's path is calculated on the basis of the number of academic years in which the applicant has been enrolled at the university, starting from the first enrolment in the Italian university system:

- for full-time students: the duration of the Bachelor's path is equivalent to the number of academic years of enrolment.
- for part-time students: each year of enrolment is counted as half-year.
- for full-time students taking part in the "Dual Career" programme: each year of enrolment is counted as half-year, as for part-time students.

In the event of credit transfer, the duration of the Bachelor's path must be increased proportionally to the number of credits that have been recognized by Politecnico (10-60 CFU =1 year, etc.). The worst 28 credits must be subtracted proportionally to the number of validated credits.

(1) Applicants must have graduated by the end of the December Graduation Period
(2) The weighted average is calculated as follows: ∑(grade*credits) / ∑credits

2) Applicants from other Italian universities

a) Applicants who have a Bachelor's degree awarded by another Italian university must have a weighted average grade of all the exams ≥ **24/30**, regardless of the number of years it took them to graduate. The weighted average grade (∑(grade*credits) / ∑credits) is calculated on all accrued course credits (graded on a scale of 30) counting towards the achievement of the Bachelor's degree, after having subtracted the worst 28 credits.

b) admissions by merit-based evaluation of the Evaluation Committee

Applicants with a weighted average grade > 21/30 and <24/30 can take an admission test (merit-based evaluation), provided that during their Bachelor's path the weighted average grade of the exams belonging to the Scientific Disciplinary Fields (settori scientifico-disciplinari) ING-INF/03 and ING-INF/05 is ≥ 24/30.

The details of the admission test are available in the section below "Merit-based evaluation for applicants from Politecnico di Torino and from other Italian universities".

Merit-based evaluation for applicants from Politecnico di Torino and from other Italian universities

The merit-based evaluation (admission test) aims to ascertain specific requirements in order to verify that prospective students have the knowledge, competencies and aptitude to the contents and learning objectives of the Master's degree programme. The admission tests consist in an oral interview (it can also be a remote interview) about the subjects of the following Scientific Disciplinary Fields: ING-INF/03 and ING-INF/05.

A positive evaluation (offer of admission) allows applicants to enrol in the programme only in the academic year in which the evaluation has been given. Admitted applicants who do not complete the enrolment process within the deadlines are required to apply again and retake the admission test in the next academic years.

Students from Politecnico who have been admitted to the programme and have advanced some Master's courses (taken during their Bachelor's path) are allowed to enrol without retaking the admission test also in the next academic year, provided that they meet the other admission requirements.

3) Applicants with a non-Italian educational qualification

To be admitted to Politecnico Master's degree programmes, applicants must have an academic qualification awarded by an accredited/recognized foreign university, earned after completing at least 15 years of total education (including primary school, secondary school and university).

Applicants who have attended a university programme lasting five or six academic years (different from the 3+2 system) without completing it must still meet the minimum requirement of 15 years of total education (of which at least 3 years at university level) and they must have earned at least 180 ECTS credits or equivalent. Pre-university courses or foundation years cannot be counted towards the minimum number of credits or the minimum numbers of years of total education mentioned above.

The applicant's academic performance and the consistency between the degree programmes offered by Politecnico and the applicant's previous academic background are assessed by the professors designated by Coordinator of the Collegio. The evaluation is carried out on the Apply@polito platform under the section called "Applicants with a non-Italian qualification."

A positive evaluation (offer of admission) allows applicants to enrol in the programme only in the academic year in which the application has been submitted. Admitted applicants who do not complete the enrolment process within the deadlines are required to apply again to the programme in the next academic years.

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More information is available at https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/master-s-degree-programmes

Art. 3 – Programme curriculum

3.1 Programme overview

The Master's degree programme in ICT Engineering for Smart Societies is organized in the following thematic areas:

1. ICT Tools and Methods: Students learn about computer and telecommunication systems, advanced programming techniques, data analysis and signal processing methods, stochastic modelling techniques, and optimisation methodologies.
2. ICT Applications in Healthcare: Students learn about physiology and pathophysiology, as well as ICT tools supporting instrumental diagnostic techniques and the ethical and scientific issues involved in ICT-assisted patient management.
3. ICT Applications in Urban and Building Design: Students study the design principles of smart buildings and cities, the properties and environmental compatibility of building materials, thermal and electrical energy control systems, and certification procedures.
4. ICT Applications in Environmental Protection: Students study remote sensing systems, positioning systems and photogrammetry.
5. ICT Applications in Transport: Students explore intelligent transport systems, related regulations, and mobility models.
6. ICT Applications in Energy: Students gain insights into energy generation, transmission, and distribution systems.

The programme also includes a multidisciplinary project, aimed at developing ICT applications in one of the aforementioned domains. This project offers students the opportunity to put into practice the knowledge acquired in different areas by tackling a concrete design problem.

At the end of the programme students are required to produce a Master's thesis, a key learning and individual working experience which allows students to further develop their ability to work both independently and within interdisciplinary teams. The thesis project, which may be carried out at Politecnico or in collaboration with a company, involves research, design, or advanced development. The thesis must demonstrate mastery of the topic, originality of the results, and effective communication skills.

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_coorte=2026&p_sdu=37&p_cds=476&p_lang=en

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=37476&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 Master's degree programme. The Student Guide is available on the web site of the degree programme.

It contains information and deadlines on:
- academic calendar;
- 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 worth 30 credits. Developing and writing a thesis normally requires a period of approximately 6 months of full-time work. The final examination consists of a 30-credit thesis or, alternatively, a 12-credit internship in a company followed by an 18-credit thesis.

The Final Examination involves an analysis, a project, or an innovative application, on a topic that must be consistent with the educational objectives of the degree programme. Students are required to write a final written document (Master's thesis). The courses offered in Year 2 are organized in a way that leaves sufficient time for the development of the thesis. Students who have completed all the exams are eligible to be admitted to the final examination.

The Master's thesis serves as a comprehensive assessment of the student's mastery of technical content, organizational and communication skills, and individual work capabilities in relation to complex analyses or projects. The final examination typically requires the application of knowledge gained from multiple courses, the integration of additional elements and the ability to propose innovative ideas. The topic and the activities connected with the thesis must be agreed upon with a faculty member from the Politecnico (a thesis supervisor and an internship tutor, if this is the case). Students are allowed to work on their thesis project also at external organizations or companies, in Italy or abroad, under the supervision of a thesis supervisor from Politecnico and a tutor from the external institution.

Students are required to publicly present and discuss the preparation activities for their thesis and the corresponding results (oral defence) in front of a Graduation Examining Committee, who will evaluate both the work carried out and the presentation.

The Master's thesis and its oral defence must be in English.

Students must submit their thesis application and request the thesis topic online through a dedicated procedure available in their personal page on the Teaching Portal, under the section entitled "Thesis," in compliance with the Graduation Periods deadlines published in the Student Guide – Thematic Calendar Section.

The final grade is given by the Graduation Examining Committee. Its members evaluate the overall average grade of all the exams on a scale of 110. The committee may add up to a maximum of 8 points, considering the following:
- quality of the thesis work (committment, autonomy, methodological rigor, relevance of results achieved, etc.);
- thesis oral defence (clarity in presentation, etc.);
- outstanding results achieved during the academic path (number of honours, time to graduation).

A degree with honours (lode) may be awarded at the Committee's discretion if the total score is at least 112.51.

If the thesis meets the required standards, the Committee may grant the dignità di stampa (printing honour) only if the final grade is 110 cum laude and the Committee's decision is unanimous.

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.