



**UNIVERSITY OF TRIESTE**  
**ACADEMIC AND TEACHING REGULATIONS**  
**for students enrolled in the academic year 2026/27**

**Master's degree programme in Engineering for the Energy Transition**  
**Classe di laurea LM-30**

**Art. 1 - Objective**

1. These regulations define in detail the contents of the related General Regulations (*Ordinamento Didattico*) of the Master's degree programme in Engineering for the Energy Transition, under art. 12, s. 1 of the Ministerial Decree no. 270/2004 on "Amendments to the regulation containing the rules concerning the teaching autonomy of universities".
2. The General Regulations and the organisation of the Master's degree are defined in respect of freedom of teaching and the rights and duties of lecturers and students.

**Art. 2 - Contents of the Academic and Teaching Regulations**

1. The Academic and Teaching Regulations define the implementation of the General Regulations of the degree course and its organisational aspects.
2. In accordance with art. 4, s. 2 of the Teaching Regulations of the University of Trieste, the Academic and Teaching Regulations define:
  - a) the list of modules (and their scientific sector), divided by year and their partition into sub-modules, and other teaching activities;
  - b) the method for carrying out laboratory and practical activities, and traineeships;
  - c) the expected learning outcomes (see annex F), the number of university credits (ECTS) and any prerequisites for modules and other teaching activities, all divided by year;
  - d) the curricula available to students and, where necessary, how to present the individual study plan;
  - e) the provisions on any compulsory attendance and/or any alternative learning plan for student workers and/or disabled people;
  - f) the entry requirements, the procedures to verify them at enrolment and any provisions on preparatory and supplementary activities aimed at fulfilling a conditional advancement;
  - g) the procedure for admission to the final examination and graduation;
  - h) the procedure for verification of knowledge of the foreign language at the required level;
  - i) the possible use of English as the teaching language for some modules.

**Art. 3 - Structure and organisation of the Master's degree programme**

The following documents and regulations set the organisation and management of the degree course:

- University Charter;
- Teaching Regulations of the University;
- General Regulations of the Master's degree;
- List of taught modules and other teaching activities;
- Annual Study Plan.

**Art. 4 - General Regulations of the Master's degree programme**



1. The General Regulations set the structure and organisation of the Master's degree programme. In particular, they contain:

- a) the name and the ministerial class to which it belongs;
- b) the expected learning outcomes of the programme in agreement with the European qualification framework;
- c) career opportunities in relation to the activities listed by ISTAT;
- d) the plan of teaching activities in agreement with the provisions of the ministerial class to which the course belongs;
- e) the number of ECTS of all teaching activities;
- f) the entry requirements and the procedure to verify them at enrolment;
- g) the method for carrying out the final examination and graduation;

2. The General Regulations can be found in the SUA (*Scheda Unica Annuale*) statement of the programme.

#### **Art. 5 - Plan of teaching activities**

1. The plan of teaching activities specifies:

- a) the list of taught modules, their scientific sectors and other teaching activities;
- b) the sub-modules into which a module may be potentially subdivided and their scientific sectors;
- c) the number of ECTS of each module or teaching activity;
- d) any progression rules between modules;

2. The plan of teaching activities can be found in the SUA statement of the programme.

#### **Art. 6 - Annual study plan**

The annual study plan is updated annually and can be found in Annex A that is reported also in the SUA statement of the programme.

#### **Art. 7 – Admissions**

In order to be enrolled students must meet specific curricular requirements and must be adequately prepared. Details can be found in Annex B.

#### **Art. 8 – Award of the degree**

1. In order to graduate a student will have to acquire 120 ECTS.

2. Given that each year conventionally corresponds to 60 ECTS, the duration of the programme is two years.

3. The degree can be awarded in less than two years should the student has acquired all 120 ECTS included in their study plan.

#### **Art. 9 - Structure of the Master's degree programme**

1. The Master's degree programme entails the following types of teaching activities:

- a) core teaching activities (teaching activity of type B - TAF B);
- b) teaching activities related to the core ones, also with reference to cross-disciplinary training (TAF C);
- c) optional teaching activities (TAF D);
- d) teaching activities related to the final examination and linguistic knowledge (TAF E);



- e) teaching activities to improve linguistic knowledge, any traineeships, computer skills, telematic and relational skills, and all skills useful for the professional career (TAF F).
- The number of ECTS assigned to each of the listed activities is specified in Annex A.
  - One ECTS corresponds to 25 hours of overall commitment per student. Usually, 1 ECTS corresponds to 8 hours of classroom teaching.

#### **Art. 10 – Laboratory and practical activities, and traineeships**

Such activities are promoted and coordinated by members of the Board of Studies. More details can be found in Annex C.

#### **Art. 10bis - Foreign Languages**

Verification of proficiency in spoken and written English, at least equivalent to level B2 of the Common European Framework of Reference for Language Proficiency, is part of the assessment of the applicant's personal preparation. This competence can be taken from the Curriculum studiorum or from an appropriate certificate issued by a qualified institution recognised as valid by the University. In all other cases, admission is verified by a test prepared by the University.

#### **Art. 11 - Teaching activities preparing for the final examination**

- In agreement with its learning outcomes and assigned number of ECTS, the final examination is an extensive project or methodological work presented together with a report (Master's dissertation). The graduating student will have to prove through the dissertation that they master the topic, they can work independently and can communicate effectively. The topic needs to be pertinent to the traineeship or to issues studied throughout the programme and will be developed with the supervision of an academic staff (supervisor) and, if necessary, with the help of co-supervisors; the latter may be an academic staff of an external expert, especially if the dissertation is written during a traineeship to the premises of an external partner (either a company or an institution other than the University of Trieste).
- The dissertation is presented and discussed during a pre-graduation examination in front of a Board nominated by the Head of Department. The Board consists of at least 3 members, one of which is the supervisor; others members can be either academic staff or external lecturers or experts. The committee assesses the content and the presentation and marks (maximum 30 marks).
- The final mark of the Master's degree programme (a mark out of 110) is calculated through following formula:

$$L = \frac{110}{30} \frac{N_{cr} * E + n * P}{N_{cr} + n} + \Delta$$

with

$$\Delta = t + d + l + c \qquad \Delta = 0 \div 6$$

where

- $N_{cr}$  sum of the number of ECTS of modules or teaching activities for which a mark is assigned;
- $N$  number of ECTS of the final examination;



- E* weighted average of the marks of modules or teaching activities for which a mark is assigned;
- P* examination mark assigned by the Pre-graduation Board;
- $\Delta$  increment determined by:
- t* type of dissertation, with  $t = 0; 1; 2$   
(0: literature-review; 1: design, workshop; 2: research project);
  - d* duration of enrolment in the programme, with  $d = 0; 1$   
(0: duration > 2.5 years (i.e. beyond extraordinary session of Year 2); 1: all other cases);
  - l* value based on number of marks “30 cum laude”, with  $l = 0; 1; 2$   
(0: no. “30 cum laude” < 4; 1:  $4 \leq$  no. “30 cum laude” < 8; 2: no. “30 cum laude”  $\geq$  8);
  - c* additional mark assigned by the Graduation Board, with  $c = 0; 1$ .

The final mark *L* is rounded off (e.g. 107.49 becomes 107 and 107.50 becomes 108).

4. The number of ECTS assigned to the final examination is specified in Annex A.

#### **Art. 12 - Examination progression**

1. In order to guarantee an appropriate teaching and learning path, the progression between examinations must be respected in accordance with the Teaching Regulations of the University.
2. The list of progression of examinations can be found in Annex D.

#### **Art. 13 - Specific curricula**

1. Within the programme, modules and teaching activities can be combined to offer specific curricula and to fulfil different cultural or professional needs.
2. Any specific curricula can be found in Annex A.

#### **Art. 14 - Submission of an individual study plan**

1. As an alternative to the regular procedure, a student can present an individual study plan for each academic year which includes from a minimum of 48 to a maximum of 84 ECTS, including those foreseen in the study plan of the student in the previous year and not yet acquired, with the constraint that the number of ECTS corresponding to modules or other teaching activities for which attendance has yet to be acquired should not exceed 60.
2. The Board of Studies may allow students to replace their modules with other modules offered from the University of Trieste or from other programmes of foreign Universities (either Bachelor’s or Master’s degrees) based on the coherence with the expected learning outcomes of the programme and the number of ECTS.

#### **Art. 15 - Assessment**

1. *Criteria for the arrangement of examination boards.* The examination board consists of two members: the module leader and another expert that can be either an academic staff or an expert of the subject. Non-academic staff experts are authorised by the Departmental Council. If the module is composed of two or more sub-modules with different leaders, they all must be part of the examination board.
2. *Assessment of taught modules and other teaching activities.* Assessment can take place with either ongoing tests or a final test to be held at the end of the module or activity.



3. *Recording of the mark for examination composed of multiple tests.* When an examination is composed of multiple tests, recording of the mark is performed only when the final mark is available.

4. *Rules for repeating failed examinations during the same academic year.* Students can repeat a failed examination in all the exam sessions of the academic calendar.

#### **Art. 16 - Mandatory attendance**

Attendance is not mandatory with the exception of any mandatory activities specified for each course.

#### **Art. 17**

Abrogated.

#### **Art. 18 - Criteria for recording ECTS for activities and skills obtained prior to the enrolment**

The Board of Studies can recognise a number of ECTS for activities performed or skills obtained prior to the enrolment to the Master's degree, if such activities are deemed coherent with the teaching activities and the expected learning outcomes of the programme as well as the duration, as specified in Annex E.

#### **Art. 19 - Minimum number of ECTS to be acquired by the student in an established lapse**

Any requirements

#### **Art. 20 - Nature of these Regulations**

These Regulations are defined as Academic and Teaching Regulations under art. 12 of the Ministerial Decree no. 270/2004.

#### **Annexes**

Ann. A: Annual study plan

Ann. B: Entry requirements

Ann. C: Traineeships

Ann. D: Progression rules

Ann. E: Recognition of previously-acquired skills or qualifications

Ann. F: Learning outcomes and teaching activities: tuning matrix



## Annex B – Entry Requirements

Enrollment in the CdS in Engineering for the Energy Transition is subject to the fulfillment of curricular requirements and the verification of the student's knowledge base.

### Curricular requirements

In order to be admitted to the CdS in Engineering for the Energy Transition, candidates must hold a Bachelor's degree in one of the following classes: Industrial Engineering (Class 10 of DM509/1999 and Class L-9 of DM270/2004) or Civil and Environmental Engineering (Class 08 of DM509/1999 and Class L-7 of DM270/2004).

As an alternative to holding a Bachelor's degree in one of the classes listed above, graduates in possession of a Bachelor's degree in Engineering are admitted to the CdS, provided that their curriculum includes specific minimum numbers of CFU (credits) in sets of scientific-disciplinary areas as defined below:

- at least 18 CFU in mathematics or in the following SSDs: MATH-02/B (MAT/03), MATH-03/A (MAT/05), MATH-03/B (MAT/06), MATH-04/A (MAT/07), MATH-05/A (MAT/08);
- at least 9 CFU in physics or in the following SSDs: PHYS-01/A o PHYS-03/A (FIS/01) e PHYS-02/A o PHYS-04/A (FIS/02);
- at least 6 CFU in chemistry or in the following SSDs: CHEM-03/A (CHIM/03) e CHEM-06/A (CHIM/07);
- at least 6 CFU in electrical engineering or in the following SSDs: IIET-01/A (ING-IND/31), IIND-08/A (ING-IND/32) and IIND-08/B (ING-IND/33), or PHYS-01/A or PHYS-03/A (FIS/01) and PHYS-02/A or PHYS-04/A (FIS/02) (additional to the previous 9 mentioned in point 2) or PHYS-04/A (FIS/03);
- at least 6 CFU in energy engineering or in the following SSDs: IIND-06/A (ING-IND/08), IIND-06/B (ING-IND/09), IIND-07/A (ING-IND/10), IIND-07/B (ING-IND/11).

Students with degrees obtained abroad are admitted to the CdS if their degree is recognized as suitable in relation to the above-mentioned Bachelor's degrees, or if they have the minimum number of CFU in certain SSDs as indicated above following the conversion of credits or titles held. To this end, a Commission appointed by the Course Board of Studies (CCS) will evaluate university certificates and check the following information: the results obtained in the exams as in grades and credits, and the syllabus.

### Personal preparation verification

Admission to the CdS in Engineering for the Energy Transition requires verification of adequate individual preparation. A degree grade of 90/110 or higher (converted in the case of a degree obtained abroad) is considered sufficient to attest to adequate individual preparation.

For those who have received a degree grade of less than 90/110, admission is subject to an interview, which may also be conducted online, with a Commission appointed by the CCS in order to evaluate the preparation of candidates on energy and electrical topics. Based on the outcome of the interview, admission to the CdS is accepted or refused.

### Linguistic skills



**MASTER DEGREE  
ENGINEERING FOR THE ENERGY TRANSITION  
CLASS LM-30  
PLAN OF STUDY  
Academic Year 2026 - 2027**

The courses are classified based as follows (type of educational activity, "TAF"):

- TAF B = characterizing courses
- TAF C = complementary courses
- TAF D = elective courses
- TAF E = final thesis
- TAF F = other activities

1 <sup>st</sup> Year – 62 credits ("CFU")					
Course	Module	Code	SSD	TAF	CFU
Renewables and Energy Systems	Renewable Energy Technologies		IIND-06/B	B	6
	Elements of Fluidmachinery and Energy Systems		IIND-06/B	B	6
	Wind Energy		CEAR-06/A	C	2
Introduction to Energy and E-Mobility	Fundamentals of the Energy Sector		IJET-01/A	B	3
	E-Mobility and Introduction to Nuclear Energy		IJET-01/A	B	3
Economics, Legislation and Evaluations for the Energy Transition	Environmental Economics		CEAR-03/C	C	3
	Energy Transition Law and Policies		GIUR-06/A	C	3
	Economic Evaluation of Industrial Projects		IIND-05/A	C	3
Modern Power Systems and Electrification	Principles of the Power Sector and Enabling Technologies for Electrification		IJET-01/A	B	2
	Low Voltage Power Systems		IIND-08/B	B	4
Energy Conservation in Buildings	HVAC System Design		IIND-07/A	B	6
	HVAC Load Calculation		IIND-07/A	B	3
	Structural and Technological Design of Building Envelopes		CEAR-08/A	C	3
Elective Course				D	15
2 <sup>nd</sup> Year – 58 credits ("CFU")					
Course	Module			TAF	CFU
Materials and Systems for Photovoltaics and the Energy Transition	Materials for Photovoltaics and Energy Transition Technologies		IMAT-01/A	C	3
	Photovoltaic Systems and Energy Management		IJET-01/A	B	3
Photovoltaic and Battery Systems Modeling and Characterization			IJET-01/A	B	6
Computational Fluid Dynamics and Heat Transfer			IIND-07/A	B	9
Hydrogen and Fuel Cells			IIND-06/A	B	6
Sustainable Materials, Processes and Critical Resources	Design for Sustainability of Processes		ICHI-01/B	C	3
	Sustainable Materials: Selection and Design		IMAT-01/A	C	3
	Strategic and Critical Raw Materials		CHEM-06/A	C	3
Electricity Market			IJET-01/A	B	4
Other Activities				F	6
Final Thesis				E	12



The courses listed in the table below do not require approval; students can add them directly through the online system “esse3”. Students may propose other elective courses, but these are subject to approval. However, students cannot enroll in an elective course if they have already taken the same or equivalent exam in previous courses of study.

<b>ELECTIVE COURSES</b>					
<i>Course</i>	<i>Modules</i>	<i>Code</i>	<i>SSD</i>	<i>TAF</i>	<i>CFU</i>
Industrial Energy Management			IIND-06/A	D	6
Battery Management Systems			IINF-04/A	D	6
Environmental Hydraulics: Pollutants, Emissions and Global Warming			CEAR-01/B	D	6
Wave and Tidal Power Plants (Module of an integrated course)			CEAR-01/B	D	3
Transport Phenomena			ICHI-01/B	D	9
Fondamenti e Metodi per la progettazione			IIND-06/A	D	6
Control Theory			IINF-04/A	D	9
Embedded Systems			IINF-01/A	D	6
Entrepreneurship & Business Modelling			ECON-07/A	D	9
Mathematical Optimization			MATH-06/A	D	6
Analisi multidisciplinare, progetto e ottimizzazione di sistemi complessi			IIND-06/A	D	3
Manutenzione e simulazione degli impianti industriali			IIND-05/A	D	6
Impianti di abbattimento delle emissioni			IIND-05/A	D	6

## **EVALUATION**

The level of knowledge will be evaluated by oral and/or written exams, as detailed by each instructor in the syllabus and at the beginning of the course.

## **FINAL THESIS**

The final thesis consists in an original and independent work in the field of energy engineering. It can take the form of an extensive analysis of the scientific literature on a current relevant topic, or a design project, or a research project based on experiments, theory, or computational simulation. The work can be carried out entirely at the University of Trieste and/or in collaboration with other universities, research centers, and industries – both domestic and international.



The verification of the knowledge, in written and oral form, of the English language, corresponding at least to level [B2] of the Common European Framework of Reference for Languages, is part of the verification of the individual preparation of candidates. This competence may be inferred from the curriculum or from an appropriate certificate issued by a language center recognized by the University of Trieste. In all other cases, admission is subject to an evaluation through an interview with a Commission appointed by the CCS.



### **Annex C – Traineeships**

Internship activity (area F) is subject to the supervision of a tutor and must be appropriately documented. It is approved (or not) by a committee composed of the tutor and another professor.

Approved internship activity is worth 3 CFU if it corresponds to a minimum of 75 hours, as specified in the Study Plan. No grades are awarded for the activity itself. If the student carries out the internship outside the university, at a company, he must contact the Teaching Secretariat of the Department of Engineering and Architecture before starting the internship. The Secretariat will provide them with insurance coverage and will draw up a specific agreement.



**UNIVERSITÀ  
DEGLI STUDI  
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**Ingegneria  
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## **Annex D – Progression rules**

None



## Annex E - Recognition of previously-acquired skills or qualifications

The Course of Study Council (CCS) may recognize some credits for activities carried out or skills acquired prior to enrollment in the Master's degree course. This is based on the congruency of the didactic and/or training activities followed with the educational objectives of the Master's degree course and the correspondence of the relative teaching loads, as indicated below:

- Professional skills and abilities may be recognized in area F up to a maximum of 3 CFU;
- Computer skills and abilities may be recognized in area F up to a maximum of 3 CFU;
- The Training Modules offered by the University of Trieste will be recognized in area D up to a maximum of 6 CFU;
- Credits for post-secondary training activities, in the design and implementation of which the University of Trieste has participated, may be recognized in area D up to a maximum of 12 CFU.

With regard to transfers from other Master's degree courses, even from other universities, the CCS evaluates the recognition of credits on a case-by-case basis, possibly using interviews to verify the knowledge actually possessed or by means of integrative tests/exams; any failure to recognize credits is adequately motivated.