ACADEMIC REGULATIONS

MASTER'S DEGREE PROGRAM in

Chemical Engineering for Industrial Sustainability – LM-22R

Cohort 2025–2026

Approved by the Academic Senate in the session of ……

1.1 Department Affiliation:
Department of Civil Engineering and Architecture
Associated Department (if any): Not applicable

1.2 Degree Class:
LM-22R – Chemical Engineering

1.3 Teaching Location:
Catania – University Campus – Via S. Sofia No. 64

1.4 Governing Bodies of the Degree Program in Chemical Engineering for Industrial Sustainability:
The degree program is governed by a council composed of the faculty members of the program and a student representative body elected according to the procedures outlined in Title VII, Chapter C, and subsequent articles of the current University Electoral Regulations.

The Degree Program Council (CdL) exercises the responsibilities set forth in the University Statute and is coordinated by a Chairperson elected by the Council, pursuant to Article 20 of the Statute, and according to the provisions in Title VII, Chapter C, and subsequent articles of the current University Electoral Regulations.

Within the Degree Program Council, a Quality Assurance Management Group (GGAQ) is established, chaired by the program chairperson or by a delegate responsible for Quality Assurance. The group also includes two additional faculty members, one student representative, and one administrative officer.

1.5 Relevant Professional Profiles:
Role in a Work Context:
Manager, Executive, Employee, Freelance Professional.

Skills Associated with the Role:
Graduates of the Master's Degree Course in *Chemical Engineering for Industrial Sustainability* are professionals capable of applying the theoretical and scientific approach of engineering to identify, formulate, and solve interdisciplinary problems related to the design and control of chemical processes and materials—even in innovative ways.

In particular, the skills associated with the role of Industrial Chemical Engineer include:

- the ability to conceive, plan, design, and manage complex and/or innovative systems, processes, and services;
- the ability to design and manage highly complex experiments;
- contextual knowledge and cross-disciplinary skills;
- knowledge in the areas of business organization (entrepreneurial culture) and professional ethics.

Career Opportunities:
Graduates of the Master's Degree in *Chemical Engineering for Industrial Sustainability* can find employment in:
a) professional studios, engineering firms, mechanical and related industries;
b) energy and plant engineering companies, automation and refining industries;
c) manufacturing companies in general, for the production, installation, testing, maintenance, and management of chemical plants;
d) production lines and departments for materials;
e) public administration;
f) freelance professional activity in the field of chemical engineering.

This program prepares for the following profession:
Chemical and Petroleum Engineers – (2.2.1.5.1)

1.6 Course Admission:
☑ Open admission
☐ Nationally limited enrollment
☐ Locally limited enrollment with entrance test

1.7 Course Language:
Courses are taught in English.

1.8 Course Duration:
Two years (biennial)

1.9 Degree Award:
The degree is awarded upon the acquisition of at least 120 ECTS credits (108 ECTS from coursework + 12 ECTS from the final thesis).

1.10 Educational Structure:
The educational structure of the Degree Program, including the general framework of the educational activities, is defined according to the guidelines established by Ministerial Decrees and in compliance with ANVUR requirements. It is detailed in Article 5 of this Regulation.

2. ADMISSION REQUIREMENTS

2.1 Educational Qualification:

Applicants may enroll in the Master's Degree Program if they meet the participation requirements outlined in Article 2 of the admission procedures:

a) Holders of a first-level degree in the degree classes 10–21 (under Ministerial Decree 509/99), or in the classes L-9 (Industrial Engineering) and L-27 (Chemical Sciences and Technologies) (Ministerial Decree 270/04). Possession of these degrees does **not** guarantee automatic admission.

b) Holders of an academic qualification obtained in Italy or abroad, deemed suitable by the Degree Program Council, which evaluates whether the academic background meets the content requirements set out in the Program Regulations.

2.2 Non-EU Candidates Residing Abroad with a Foreign Qualification:

Applicants must hold a qualification obtained abroad, recognized as valid according to current regulations. All international students are subject to the rules outlined in the *"Procedures for the admission of foreign/international students to higher education courses in Italy,"* available at: www.studiare-in-italia.it
Admission for non-EU students residing abroad is governed by the University's public call *"Public Selection for the Admission of Non-EU Students Living Abroad,"* available at: https://www.unict.it/it/corsi-numero-programmato/2025-2026/public-selection-admission-non-eu-students-living-abroad-english

Applicants with foreign qualifications can access the support services dedicated to international students offered by the University of Catania.

2.3 Curricular Requirements

Admission to the Master's Degree in *Chemical Engineering for Industrial Sustainability* is subject to the possession of knowledge equivalent to the qualifying educational objectives defined for the Bachelor's Degree Classes in Industrial Engineering (L-9) and Chemical Sciences and Technologies (L-27), as per Ministerial Decree of 16 March 2007. In particular, the following curricular requirements are necessary:

- Possession of one of the aforementioned degrees;
- Knowledge of English at least at B2 level.

The Program's Academic Regulations establish the procedures for verifying the applicant's personal academic background. These curricular requirements must be met at the time of evaluation.
The regulations also define criteria for applicants with different degrees, especially foreign degrees, and may include a minimum graduation score required for admission.

2.4 Admission Tests and Verification of Academic Preparation

Applicants' knowledge and skills necessary for enrollment, including English proficiency (minimum B2 level according to the Common European Framework), will be assessed by a Committee through the analysis of the applicant's academic transcript and an individual interview.

To allow access to graduates from academic backgrounds not perfectly aligned with the required prerequisites, the interview will verify knowledge and skills in basic subjects relevant to the core scientific-disciplinary areas of the program. English language proficiency will also be assessed and must be at least B2 level.

The examination committee consists of three tenured professors, according to the procedures established in the University call.

2.5 Criteria for Recognition of Credits Earned in Other Degree Programs

The Degree Program Council in *Chemical Engineering for Industrial Sustainability* may fully or partially recognize credits obtained by a student at another university or in another degree program.
For students coming from degree programs in the same class (LM-22 – Chemical Engineering), at least 50% of the credits already earned in the same scientific-disciplinary areas must be recognized.
For matters not specifically addressed, the University's Academic Regulations shall apply.
Activities already recognized for university credits in another program cannot be recognized again for credits in the Master's, single-cycle Master's, or other degree programs.

2.6 Criteria for Recognition of Certified Professional Skills and Other Post-secondary Learning

Professional skills and work experience in companies, public or private institutions, or professional associations—if appropriately certified and relevant to the educational path—may be recognized as "Internships."
A maximum of **6 ECTS credits** may be recognized.
Activities already recognized for university credits in another program cannot be recognized again for credits in the Master's, single-cycle Master's, or other degree programs.

2.7 Criteria for Recognition of ECTS Credits from Public Administration Training Programs or Other Post-secondary Education with University Participation

Skills acquired through training programs conducted by public administration institutions or other post-secondary educational activities developed in collaboration with the University may be recognized, provided the Degree Program Council is informed in advance. In such cases, recognition will be formalized

through a specific resolution.
As above, credits already recognized in another program cannot be recognized again.

2.8 Criteria for Recognition of ECTS Credits for Sporting Achievements

Students who have earned an Olympic or Paralympic medal, or have achieved the title of absolute World, European, or Italian Champion in disciplines recognized by the Italian National Olympic Committee (CONI) or the Italian Paralympic Committee (CIP), may receive credit recognition regulated by a specific resolution of the Degree Program Council.
As in previous cases, credits already recognized cannot be recognized again in another degree program.

2.9 Maximum Number of Recognizable Credits under Sections 2.6, 2.7, and 2.8:

24 ECTS credits (as per Ministerial Decree No. 931 of July 4, 2024)

3. TEACHING ORGANIZATION

3.1 Structure of the Educational Path

The educational path follows a **single curriculum**.

3.2 Time Distribution

Teaching activities are divided into **two semesters** per academic year.

3.3 Dual Degree Program

There is currently **no dual degree program** in place. (A dual degree program with a Lithuanian university is under approval.)

3.4 Attendance

Attendance is **compulsory**, except as provided in Article 27 – *Attendance of educational activities*, and Article 30 – *Working students, athletes, students in vulnerable situations, with disabilities or in detention* of the current University Academic Regulations.
Students must attend **at least 70%** of the hours for each course.
Students who fail to meet attendance requirements for courses in their curriculum during the previous academic year are regularly enrolled in the following year, but must fulfill attendance requirements for the missed courses.
After the two years, students are enrolled as "**fuori corso**" (out-of-course) and must still meet attendance requirements according to the **prerequisite rule**.

3.5 Methods for Monitoring Attendance

Attendance is monitored by each course instructor.

3.6 Types of Teaching Methods

The teaching methods adopted include:

- **Lectures (F):** 1 ECTS = 7 classroom hours
- **Exercises (E):** 1 ECTS = 13 classroom hours
- **Laboratory work (L):** 1 ECTS = 15 hours of assisted work
- **Final thesis work (PF):** 1 ECTS = 25 hours of independent study

3.7 Assessment Methods

Assessment methods vary by course and may include:

- (o) oral examination
- (s) written examination
- (t) written assignment
- (p) practical or laboratory test
- (g) graphic test

3.8 Rules for Submitting Individual Study Plans

As a rule, students are **not allowed to submit individual study plans**. However, students who completed similar courses during their Bachelor's program may request substitutions. The Degree Program Council evaluates and may approve the proposed substitutions if they are consistent with the curriculum and comply with regulations.
Generally, students may customize only the **9 ECTS credits** reserved for *elective activities* (see § 4.1).
Study plans may typically be submitted during two periods: from **enrollment to December 15**, and from **February 1 to March 30**.

3.9 Periodic Review of Knowledge Obsolescence

Not applicable.

3.10 Review of Credits Older Than Six Years

Not applicable.

3.11 Recognition of Studies Completed Abroad

In accordance with Article 32 – *Recognition of studies completed abroad* of the University's Academic Regulations, students may complete part of their studies at foreign universities or institutions with which UniCT has signed student mobility agreements.
Before departure, students must submit a Learning Agreement (LA)/Activities Proposal (AP) to the Degree Program Council through the Departmental Office for International Mobility (UDI). The document must specify the host institution and the academic activities to be taken abroad, intended to replace an equivalent number of credits in the student's official curriculum.

The Degree Program Council evaluates the LA/AP based on the coherence of the proposed program with the educational goals of the degree. The Council may approve replacements even in the absence of exact correspondence between course content. The decision includes the equivalence between the proposed and curricular activities and the number of recognized credits.

If the proposal is rejected, a written justification must be provided. Grades will be converted using the official University conversion table (available in the recognition procedures for outgoing mobility participants).

Further details are available in the *"Official University Procedure for Approval of Learning/Training Agreements under Erasmus Plus and International Mobility Calls."*

3.12 Recognition of Credits from Other Italian Universities

Credits obtained at other legally recognized Italian universities under mobility agreements may be recognized in compliance with national regulations and specific rules of the University of Catania.

Credits must be relevant to the *Chemical Engineering* educational path and are recognized following a resolution by the Degree Program Council.

3.13 Academic Guidance and Tutoring

The *Chemical Engineering for Industrial Sustainability* degree program provides ongoing academic guidance through updates on the program's official website:
http://www.dicar.unict.it/corsi/lm-22

Available resources include:

- **Faculty tutors:** Link
- **Student representatives on the Council:** Link

Faculty tutors, student representatives, and the Program Chairperson offer advisory support to students. The Chair also holds regular meetings with student representatives to discuss academic life, study plan issues, and general concerns. Feedback is reported anonymously to the Degree Program Council.

Additionally, a psychological counseling service is available and advertised on the course website: https://www.unict.it/it/servizi/counseling-psicologico
This service supports students facing difficulties such as exam anxiety, concentration problems, learning issues, or interpersonal challenges, while fully respecting their privacy.

3.14 Evaluation of Teaching Activities

Student feedback on teaching is collected annually via the **OPIS questionnaire**, with procedures defined by the University's Quality Assurance Office.
Anonymity is guaranteed.
The results are published on the University portal and analyzed by the **Quality Assurance Group (GGAQ)** to identify areas for improvement.
The degree program promotes awareness among students about the importance of OPIS surveys.

3.15 Internships and Placement

Internships are mandatory and worth 6 ECTS, equivalent to 150 hours, carried out in companies partnered with the University through the DICAR Internship Office.
Placement services are managed by the University's central career office:
https://placement-unict.almalaurea.it/

4. OTHER EDUCATIONAL ACTIVITIES

4.1 Elective Courses (Student's Choice)

Students may freely choose **9 ECTS credits** from any course offered by the University, provided the choice is consistent with the student's educational plan and does **not duplicate content** already present in the curriculum.
Students must notify the **Degree Program Council** of the chosen courses for which they intend to take exams.

4.2 Additional Educational Activities *(pursuant to Art. 10, paragraph 5, letters c, d of Ministerial Decree 270/2004)*

a)Additional language knowledge: **Not provided**
b)Computer and telematic skills: **Not provided**

c)Internships and career orientation: **6 ECTS**
d) Other knowledge useful for entering the job market: **Not provided**

4.3 Study Periods Abroad and/or in Italy

Educational activities carried out abroad that are **not recognized as equivalent** to curricular courses are considered in the evaluation of the **final exam**, awarding:

- **0.5 points** if at least **6 ECTS** were completed abroad
- **1 point** if at least **15 ECTS** were completed abroad

(see § 4.4 for integration with graduation score)

4.4 Final Thesis

The final thesis is worth 12 ECTS credits.
It consists of a written dissertation, presented in English, and may be completed at a foreign university or research institution.
The thesis must explore in-depth topics covered during the curriculum or involve the design and/or implementation of original research.

Supervision is carried out by one or more advisors, usually chosen among the faculty members of the degree program or the Department of Civil and Architectural Engineering. In case of a thesis abroad, advisors may also include qualified personnel at the host institution.

The thesis may be:

- **Research-based**
- **Project-based**
- **Theoretical/compilative**

The thesis topic must be relevant to the student's curriculum and refer to one of the courses in their study plan.

Graduation Score Calculation

The final score (**V**) is calculated based on the student's academic career and the committee's evaluation, using the following formula:

- V = Final grade
- M = Weighted average of exams (30 cum laude is counted as 30)
- C = Committee score
- E = 0.5 points for 6 ECTS abroad, 1 point for 15 ECTS abroad (see § 4.3)
- L = 0.2 points for each grade of 30 cum laude
- S = 0.1 points for every 3 ECTS of additional elective courses beyond the required curriculum

Constraints:

- The final score V is rounded to the nearest whole number
- $18 \leq M \leq 30$

- The committee score C is limited to:
  - max 3 if M < 22
  - max 4 if 22 ≤ M < 26
  - max 5 if M ≥ 26
- The combined bonus E + L + S must be ≤ 1.5

Awarding of Honors (cum laude)

On unanimous decision of the committee, *cum laude* may be awarded if:

- V ≥ 111, and the weighted average in 110ths is at least 105, and the student has obtained at least 3 grades of 30 cum laude,
  or
- V ≥ 111, and the weighted average in 110ths is at least 107

If the thesis is compilative/theoretical, the maximum score (C) the committee may award is 3, and honors cannot be granted.

ART. 5 – DEGREE PROGRAM REGULATIONS

LINK: https://www.dicar.unict.it/it/corsi/lm-22/ordinamento

RAD CHIUSO IL 3/1/2025

ART. 6. SUA-CDS PROGRAMMED TEACHING

COURSE LIST

Coorte 2025/2026

n.	SSD	Denomination	CFU	n. ore		Prerequisites	Year of the program	Lenguage	Learning objectives
				Lessons	Other activities				

1	ING-IND/25	Chemical Plants	6	28	65		2	ENG	The course introduces to the knowledge of the more widespread process industry plants and equipment (Unit Operations), providing the fundamental elements for the choice and the calculation of the main units used in the operations of phase separation and for their management.
2	ING-INF/04	Control of Chemical Processes	9	28	65		2	ENG	Aim of the course is to introduce the fundamentals of process control, starting from modelling issues to design of PID controllers for chemical plants and processes. Theoretical aspects as well as practical procedures are covered.
3	ING-IND/14	Equipment Designfor Chemical Industry	9	28	65		2	ENG	The course aims at delivering the basic skills in structural analysis and design, with special focus to chemical plants-related structures and components. The students who positively pass an exam should be able to assess, verify and design simple piping lines, supporting structures, pressure vessels and the most typical related sub-components. To achieve this goal is essential an extensive preliminary review of basic concepts of construction science.
4	ING-IND/27	Industrial Chemistry and Technology	6	21	39		1	ENG	The course aims to provide students with the fundamental concepts in relation to the acquisition of theoretical and practical knowledge relating to the design of chemical plants and systems processing chemicals, organization and control of production and optimization of industrial processes

5	ING-IND/13	Mechanical Engineering	6	21	39		1	ENG	The course is divided into two parts. In the first part the basic concepts of Applied Mechanics are provided to the students while in the second one issues related to the mechanical vibrations are dealt.
6	ING-IND/21	Metallurgy	9	28	65		2	ENG	The course considers the technological requirements that serve the activities of Chemical Engineering, aims to implement knowledge of the materials used for any tough or harsh work environments and then tries to produce the best knowledge of the properties of the materials themselves that technological interventions designed to improve the ability, depending on use. Particular attention is given to the corrosion and protection of materials and radioactive sources.
7	ING-IND/24	Transport Phenomena For Chemical Engineering	12	72	68		1	ENG	Acquisition of the concepts of momentum, energy and matter balance and the basic mathematical tools aimed at implementing the laws of molecular transport on a microscopic scale for the determination of the velocity profiles, temperature and matter concentration; using of semiempirical of coefficients for the description of transport between the phases in macroscopic systems of engineering relevance.

8	ING-IND/22	Materials Science and Technologies	9	28	65		1	ENG	The aim of the course is to introduce material structures, materials structure-property relationship and some of the most important technological process. Metals, ceramics, polymers and composites will be discussed. Introduction to material reclying methodology will be provided and Life Cycle Analysis techniques will be shortly presented.
9	ING-IND/11	Sustainable Energy Systems	6	21	39		1	ENG	The course aims to provide knowledge, methodologies and theoretical formulations basic of heat power systems and heat-work conversion processes and or the proper use of traditional sources of energy and / or renewable. Analysis of technical applications of engineering systems focusing on the techniques of energy production with reduced environmental impact.
10	ING-IND/14	System Eco-friendly design for Innovative Processes	9	28	65		2	ENG	The aim of the course is to provide chemical engineers. To teach structural calculation, elements to understand the problems of this sector and interactions with the designers of the equipment.
11	ING-IND/22	Technologies for environmental protection	6	21	39		1	ENG	Knowledge of the main environmental issues related to industrial chemistry and of the tools needed to reduce or eliminate such effects in order to develop sustainable industrial chemistry
12		Other activities	3		45		1	ENG	Provide technical skills on specific subjects of the chemical engineering

In line with the objectives indicated for the individual course, the prospective teacher (whether internal or external) must provide the teaching department responsible for the degree program in advance with the course contents, reference texts, and teaching materials.

7. OFFICIAL STUDY PLAN

Cohort 2025-2026

7.1 CURRICULUM UNICO

n.	SSD	**Denomination**	**CFU**	***Didactic form***	***Verification of preparation***	***Frequency***
1° anno - 1° periodo						
1	ING-IND/22	Technologies for enviromental protection	6	F-E	s-o	si
2	ING-IND/27	Industrial Chemistry and Technologies	6	F-E	s-o	si
3	ING-IND/24	Transport Phenoma For Chemical Engineering	12	F-E	s-o	si
1° anno - 2° periodo						
4	ING-IND/22	Materials Science and Technologies	9	F-E	s-o	si
5	ING-IND/13	Mechanical Engineering	6	F-E	s-o	si
6	ING-IND/11	Sustainable Energy Systems	6	F-E	s-o	si
		Elective Courses	9			
2° anno - 1° periodo						
7	ING-IND/25	Chemical Plants	9	F-E	s-o	si
8	ING-INF/04	Control of Chemical Processes	9	F-E	s-o	si
9	ING-IND/14	Equipment Design for Chemical Industry	9	F-E	s-o	si
2° anno - 2° periodo						
10	ING-IND/21	Metallurgy	9	F-E	s-o	si
11	ING-IND/14	System Eco-friendly design for Innovative Processes	9	F-E	s-o	si
		Traineeship	6	-	-	*si*
12		Other activities	3	F-L	p-o	si
Gruppo opzionale						

		Master Thesis	***12***	PF		

Legend:

SSD: Scientific Disciplinary Sector

CFU: University Educational Credits (ECTS)

Teaching method: (F) frontal lectures; (E) exercises (or equivalent assisted activities)

Assessment method: (s) written exam; (o) oral exam; (p) discussion of technical/design/graphic work.

ART. 8 DUTIES AND OBLIGATIONS OF STUDENTS

8.1 Students are required to comply with legislative, statutory, and regulatory norms, as well as the provisions issued by the competent authorities, for the proper conduct of teaching and administrative activities.

8.2 Students must behave in a manner that does not harm the dignity and decorum of the University, respecting the Code of Ethics, in all their activities, including internships and traineeships carried out at other national and international institutions.

8.3 Any sanctions are imposed by decree of the Rector, according to the provisions of current legislation.

8.4 Specific obligations include:

Mandatory completion of OPIS forms before taking each exam;

Mandatory completion of the Alma Laurea questionnaire before uploading the thesis;

Mandatory return of borrowed books from the University Libraries before uploading the thesis.