DESCRIPTION OF THE STUDY PROGRAMME

The two-year master's degree course is divided into 3 curricula:

- chemical engineering, which can be oriented more towards the areas of process and design, biotechnology-food and environment and safety;

- chemical engineering of materials, oriented towards production processes, choice and maintenance of materials in various fields (mainly chemical engineering but also aerospace, mechanics, construction, cultural heritage);

- chemical engineering for innovative processes and products (delivered entirely in English), focusing more on innovative processes and products with special attention to the latest developments in process engineering, sustainable production with reduced environmental impact and microscale processes.

Each curriculum includes a first substantial group of subjects, characterizing and related, which define a wealth of knowledge and skills common to all graduates trained according to that curriculum, and further groups of characterizing lessons that allow the deepening and acquisition of more specific knowledge related to areas of application of particular interest.

The first group includes 7 lessons, for a total of 57-63 CFU, and provides, for all curricula, advanced mathematical methodological tools for the analysis of processes, principles and methodologies of process and equipment control, economic knowledge to assess the extent and profitability of the investments needed to build production facilities, methodologies to simulate the behavior of reagent systems or non-balance thermodynamics, the design of heat exchange equipment and make separations of a more particular type or theoretical methodologies underlying the development of processes. In each curriculum there are specific insights, which concern, for the first curriculum, thermodynamics and effluent treatment processes, for the second, metallurgical processes and plants and ceramic and/or polymeric and composite materials, for the third, water treatments and environmental technologies and microscale separation processes.

Another 4 lessons should be chosen, for each curriculum, in lists of recommended courses that allow to deepen the knowledge in the specific field of interest.

The training course is completed by free choice activities, activities useful for the integration into the world of work (seminars with the participation of experts, also international, from the world of work and research) and the final test, i.e. the writing and presentation of a thesis in which a specific topic in the field of chemical engineering is discussed in an in-depth and original way.

For each teaching there are frontal lessons, accompanied by exercises, workshops, group work, and any other activity that the teacher deems useful for teaching. The learning is verified through an examination that may include written, oral and/or practical tests according to modalities defined by the teacher and indicated in the course program.

Curricula/addresses

There are 3 curricula, one of which is entirely in English:

Curriculum Ingegneria Chimica (in Italian)

Compulsory subjects

Subject	SSD	CFU	type	exam	term	type of activity
Economia dell'industria di processo	ING-IND/35	6	CR	E	1	5B
Termodinamica per l'ingegneria chimica 2	ING-IND/24	6	CR	E	2	1B

1 subject chosen between the following two						
Metodi matematici per l'ingegneria	MAT/05	6	CR	E	1	5B
	MAT/08	3				
Mathematical methods for chemical engineering	MAT/05	6	CR	E	1	5B
	MAT/06	3				

1 subject chosen between the following two						
Processi di trattamento dei reflui liquidi	ING-IND/22	9	CR	E	1	1B
Water treatment processes and environmental technology	ING-IND/22	9	CR	E	3	1B

1 subject chosen between the following two						
Reattori chimici	ING-IND/24	9	CR	E	2	1B
Non equilibrium thermodynamics with an application to the microscale	ING-IND/24	9	CR	E	1	1B

1 subject chosen between the following two						
Progettazione degli impianti chimici I	ING-IND/25	9	CR	E	2	1B
Theory and development of process design	ING-IND/26	9	CR	E	4	1B

1 subject chosen between the following two						
Sistemi di controllo degli impianti chimici	ING-IND/25	9	CR	E	3	1B
Computer aided process control	ING-IND/25	9	CR	E	3	1B

Guided eligible courses

2 subjects chosen among	**SSD**	**CFU**	**type**	**exam**	**term**	**type of activity**
Non equilibrium thermodynamics with an application to the microscale (*)	ING-IND/24	9	CR	E	1	1B
Separation processes with an application to lab-on-chips	ING-IND/24	9	CR	E	1	1B
Reattori chimici (*)	ING-IND/24	9	CR	E	2	1B
Progettazione degli impianti chimici I (*)	ING-IND/25	9	CR	E	2	1B
Processi e impianti metallurgici	ING-IND/21	9	CR	E	2	1B
Principi di ingegneria biochimica	ING-IND/24	9	CR	E	2	1B
Impianti alimentari e biochimici	ING-IND/25	9	CR	E	3	1B
Sicurezza degli impianti chimici	ING-IND/25	9	CR	E	3	1B
Tecnologia del petrolio e del gas naturale	ING-IND/27	9	CR	E	3	1B
Theory and development of process design (*)	ING-IND/26	9	CR	E	4	1B

2 subjects chosen among						
Process and product safety in the chemical	ING-IND/27	6	CR	E	1	1B

industry						
Apparecchiature per il trattamento dei solidi	ING-IND/25	6	CR	E	2	1B
Catalisi industriale	ING-IND/27	6	CR	E	2	1B
Nanobiotechnology	ING-IND/25	6	CR	E	3	1B
Green chemistry and process engineering	ING-IND/27	6	CR	E	3	1B
Progettazione degli impianti chimici II	ING-IND/25	6	CR	E	4	1B

(*) If not already chosen

Other activities

Attività	**CFU**
Eligible subjects	12
Thesis	20
Educational activities (art.10, comma 5, lettera d)	1

Regarding the 12 credits of elective subjects, taking into account the indications of the 270 Ministerial Decree, students should select their elective subjects among the characterizing subject of the Manifesto.

Curriculum Ingegneria Chimica dei materiali (in Italian)

Compulsory subjects

Insegnamento	**SSD**	**CFU**	**type**	**exam**	**term**	**type of activity**
Economia dell'industria di processo	ING-IND/35	6	CR	E	1	5B
Processi e impianti metallurgici	ING-IND/21	9	CR	E	2	1B

1 subject chosen between the following two						
Metodi matematici per l'ingegneria	MAT/05	6	CR	E	1	5B
	MAT/08	3				
Mathematical methods for chemical engineering	MAT/05	6	CR	E	1	5B
	MAT/06	3				

1 subject chosen between the following two						
Reattori chimici	ING-IND/24	9	CR	E	2	1B
Non equilibrium thermodynamics with an application to the microscale	ING-IND/24	9	CR	E	1	1B

1 subject chosen between the following two						
Progettazione degli impianti chimici I	ING-IND/25	9	CR	E	2	1B
Theory and development of process design	ING-IND/26	9	CR	E	4	1B

1 subject chosen between the following two						
Sistemi di controllo degli impianti chimici	ING-IND/25	9	CR	E	3	1B
Computer aided process control	ING-IND/25	9	CR	E	3	1B

1 subject chosen between the following two						
Materiali polimerici e compositi	ING-IND/22	9	CR	E	3	1B
Materiali ceramici	ING-IND/22	9	CR	E	4	1B

Guided eligible courses

1 subject chosen among	SSD	CFU	type	exam	term	type of activity
Non equilibrium thermodynamics with an application to the microscale (*)	ING-IND/24	9	CR	E	1	1B
Reattori chimici (*)	ING-IND/24	9	CR	E	2	1B
Progettazione degli impianti chimici I (*)	ING-IND/25	9	CR	E	2	1B
Theory and development of process design (*)	ING-IND/26	9	CR	E	4	1B
Materiali ceramici (*)	ING-IND/22	9	CR	E	4	1B
Materiali polimerici e compositi (*)	ING-IND/22	9	CR	E	3	1B

3 subjects chosen among						
Metallurgia dei non ferrosi	ING-IND/21	6	CR	E	1	1B
Tecnologie metallurgiche	ING-IND/21	6	CR	E	1	1B
Applied metallurgy	ING-IND/21	6	CR	E	1	1B
Experimental techniques for materials characterization	ING-IND/22	6	CR	E	1	1B
Processi di polimerizzazione	ING-IND/27	6	CR	E	1	1B
Corrosion engineering	ING-IND/22	6	CR	E	2	1B
Materiali compositi avanzati	ING-IND/22	6	CR	E	4	1B
Sustainable design of materials	ING-IND/22	6	CR	E	4	1B
Unità Didattica Integrata: Produzione e caratterizzazione di materiali nanocompositi - Produzione e caratterizzazione di materiali nanocompositi - materiali massivi - Produzione e caratterizzazione di materiali nanocompositi - rivestimenti	ING-IND/22 ING-IND/22	3 3	CR	E	4	1B

(*) if not already chosen

Other activities

Attività	**CFU**
Eligible subjects	12
Thesis	20
Educational activities (art.10, comma 5, lettera d)	1

Regarding the 12 credits of elective subjects, taking into account the indications of the 270 Ministerial Decree, students should select their elective subjects among the characterizing subject of the Manifesto.

Curriculum Chemical engineeering for innovative processes and products (fully inn English)

Compulsory subjects

Subject	**SSD**	**CFU**	**type**	**exam**	**term**	**type of activity**
Mathematical methods for chemical engineering	MAT/05	6	CR	E	1	5B
	MAT/06	3				

Subject	SSD	CFU	type	exam	term	type of activity
Non equilibrium thermodynamics with an application to the microscale	ING-IND/24	9	CR	E	1	1B
Separation processes with an application to lab-on-chips	ING-IND/24	9	CR	E	1	1B
Economics of technology and management	ING-IND/35	9	CR	E	2	5B
Water treatment processes and environmental technology	ING-IND/22	9	CR	E	3	1B
Computer aided process control	ING-IND/25	9	CR	E	3	1B
Theory and development of process design	ING-IND/26	9	CR	E	2	1B

Guided eligible subjects

4 subjects chosen among	SSD	CFU	tipo	Veri-fica	Periodo didattico	Tipologia di attività
Applied metallurgy	ING-IND/21	6	CR	E	1	1B
Experimental techniques for materials characterization	ING-IND/22	6	CR	E	1	1B
Process and product safety in the chemical industry	ING-IND/27	6	CR	E	1	1B
Corrosion engineering	ING-IND/22	6	CR	E	2	1B
Principles of biochemical engineering	ING-IND/24	6	CR	E	2	1B
Sustainable design of materials	ING-IND/22	6	CR	E	4	1B
Green chemistry and process engineering	ING-IND/27	6	CR	E	3	1B
Nanobiotechnology	ING-IND/25	6	CR	E	3	1B
Transport phenomena in microsystems and micro/nano reactive devices	ING-IND/24	6	CR	E	4	1B
Computational methods for chemical and biochemical reactor dynamics	ING-IND/26	6	CR	E	4	1B

Other activities

Attività	CFU
Eligible subjects	12
Thesis	20
Educational activities (art.10, comma 5, lettera d)	1

Regarding the 12 credits of elective subjects, taking into account the indications of the 270 Ministerial Decree, students should select their elective subjects among the characterizing subject of the Manifesto.

Key

Credits: University educational credits

SSD: Scientific Disciplinary Sector

Type of subject
CR: standard subject
CL: laboratory subject
CM: monographic subject

Activity		Credits
Elective subject	12	
Final exam		20
Educational activities (art.10, comma 5, letter d)		1

Exam
E: exam
V: pass/fail assessment

Type of activity

1A: basic educational activities 1st
1B: characterizing educational activities
5A: elective educational activities
5B: related and integrative educational activities
5C: educational activities related to the final exam
5D: other educational activities (art 10,comma1 letter d)
5E: traineeships and internship

Term:
1: 1st term of the 1st year
2: 2nd term of the 1st year
3: 1st term of the 2nd year
4: 2nd term of the 2nd year

Methods used to assess the achievement of the learning outcomes
To assess if the student has learned the contents of each subject, the Programme organizes various exams which may include written, practical and/or oral tests, according to the procedures established by each Professor and indicated on the Study Programme website.
Regarding the "other useful knowledge to enter the job market ", there is no official exam if not a simple pass/fail assessment, according to the evaluation methods established by the Chemical Engineering and Materials Engineering Academic Committee (https://web.uniroma1.it/cdaingchim / teaching / info-useful).
To assess the students' knowledge and understanding and their ability to apply their knowledge and understanding skills to the various areas involved, the Programme organizes an evaluation test for each subject, which may include written, practical and / or oral tests and, in some cases, the drafting of a paper.
To assess the students' independence of judgment, communication skills and learning skills, the Programme organizes oral exams, as well as other activities related to the preparation and presentation of the graduation thesis.

Regulations regarding the students' transition to following academic years
To transition to the second year, students must have acquired at least 30 credits.

Prerequisites
There are no prerequisites.

Study periods abroad
The subjects attended at European or foreign universities, with which the Engineering Faculty has agreements, projects and / or arrangements in force, are recognized according to the procedures indicated in the agreements.

Students may, after receiving the approval of the Chemical Engineering and Materials Engineering Academic Committee, carry out a period of studies abroad through the exchange programmes Erasmus + (at Universities) and Erasmus Placement (at companies): for further information please visit the following website: https://web.uniroma1.it/cdaingchim/erasmus/erasmus .
Students can also undertake their graduation thesis preparation at universities, laboratories or research centres abroad. In this case, students may take advantage of the "thesis abroad scholarships" that are made available by the Faculty though an official call for applications.
As indicated in the University Academic Regulations, the Degree Programme evaluates the studies, exams and academic qualifications undertaken by the students abroad to allocate credits in the corresponding scientific disciplinary sectors.

Part-time Students
Students enrolling and students already enrolled in the Programme, who are also engaged in other activities, may request to benefit from the part-time solution and therefor to have the possibility of achieving a lower number of annual credits, instead of the usual 60 credits which are expected for each academic year. This solution usually means extending the length of the Programme.
The rules and procedures related to part-time students are indicated in the University Regulations. For further information please visit the following website: https://www.uniroma1.it/it/pagina/part-time .

Students enrolled in previous educational systems
Students enrolled in the Chemical Engineering Degree (DM 270 - Order 2009) may request to transfer to the current educational system (2011) by submitting an application to the Academic Committee of the Chemical Engineering and Materials Engineering department. The application must contain the documentation of the sat exams.
The Committee will decide which credits may be recognized and will provide the students with the indications on how to submit an individual study plan which takes into account the educational system and the subjects already attended.

Transfers
Students that intend to transfer to the Masters Degree in Chemical Engineering must submit their application to have their credits recognized. By doing so they will also receive indications on how to submit an individual study plan which takes into account the educational system and the subjects already attended.

General information
The programmes of the subjects are available at the following website:
https://corsidilaurea.uniroma1.it/it/corso/2018/ingegneria-chimica-0 and on the websites of the Professors.