UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2025/26
BACHELOR
Industrial Chemistry (Class L-27)
Students enrolled in 2024-2025 academic year

HEADING	
Degree classification - Denomination and code:	L-27 Chemistry
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	2nd
Access procedures:	Open, subject to completion of self-assessment test prior to enrolment
Course code:	F6X

PERSONS/ROLES

Head of Study Programme
Prof. Luigi Falciola

Degree Course website
https://chimicaindustriale.cdl.unimi.it/it

Administrative students office

Via Celoria, 18 - 20133 MILANO Phone 0250325032 https://www.unimi.it/it/node/360 https://www.unimi.it/it/node/359/ https://informastudenti.unimi.it/saw/ess?AUTH=SAML

Department of Chemistry

Via Golgi, 19 - 20133 MILANO http://www.chimica.unimi.it

Didactic Office of the Department of Chemistry

Sig. Antonino Nucera - Via Golgi, 19 - 20133 MILANO Phone 02 50314419 dal lunedì al venerdì dalle ore 10 alle ore 12, in altri orari previo appuntamento https://informastudenti.unimi.it/saw/ess?AUTH=SAML

DSA and disability tutor

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Entrance guidance tutor

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Referent of the Quality Management System (QA) of The Bachelor's degree

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Study plan, transfer and credit recognition tutor

Pierluigi Mercandelli Phone 02503 14447 https://www.unimi.it/it/ugov/person/pierluigi-mercandelli Email: pierluigi.mercandelli@unimi.it

Tutor for teaching support

Alberto Vertova (Tel. 02503 14232) e Vittoria Guglielmi (Tel. 02 50314426)
https://chimica.unimi.it/it/dipartimento/organizzazione/commissioni-didattiche/tutoring Email: tutoring.chimica@unimi.it

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

It is the specific objective of the degree course in Industrial Chemistry to enable the student both to continue with higher studies, and to immediately enter a professional activity.
The course allows you to acquire an adequate basic knowledge, not only theoretical but also experimental and applicative, in the main sectors of chemistry and to provide an adequate preparation in the mathematical and physical disciplines.
In addition, it aims to achieve the following educational objectives:
- acquisition of an adequate knowledge of the tools for the deepening of application issues, such as the product-process connection;
- acquisition of the knowledge necessary to evaluate the different theoretical and practical aspects of the production of chemical products from the laboratory to the industrial scale, respecting the environment;
- acquisition of a good knowledge of experimental methods in the chemical and industrial fields;
- acquisition of appropriate tools to frame the knowledge of chemistry and industrial chemistry in relations with other scientific and technical disciplines;
- development of in-depth basic knowledge Moderna chemical-industrial, useful for the insertion in work activities that require the ability to apply modern scientific methods and techniques.
The acquired skills allow the graduate to carry out appropriate activities in specific professional fields, to interact with culturally contiguous professionals and to continue their studies in the Master's Degree courses.

Expected learning outcomes

- Knowledge of chemical science and technology in the fields of chemistry and industrial chemistry.

- Ability to collect, analyze and process the data obtained in the laboratory, to perform experimental procedures and to compile reports in this regard with reference to: synthesis and characterization of compounds, chemical-physical techniques and methodologies, recognition of molecular and structural properties of products and materials, safe use and disposal of chemical substances.

- Acquisition of conscious autonomy of judgment with reference to: evaluation and interpretation of experimental laboratory data, design, programming and conduct of experiments, formulation and proposal of solution of analytical problems, placement of specific chemical knowledge in their relations with other disciplines, retrieval and screening of sources of information, data and chemical literature.

Graduates of the Industrial Chemistry course will be able to communicate the results of their analyses and evaluations in a clear and effective way, using the most widespread language in the international working contexts of reference (English Moderna) and using modern computer tools for the analysis and presentation of data. They must also be able to work in groups and operate with defined degrees of autonomy.

The expected learning outcomes are: the acquisition of adequate skills for the development and updating of skills with regard to bibliographic research, databases and other information on the network, the acquisition of autonomy that allows you to consult advanced textbooks and specialized journals in the research sectors of chemistry and scientific disciplines, and the ability to be ready to enter the world of work.

Professional profile and employment opportunities

Graduates will be in possession of knowledge suitable to carry out professional activities, also contributing to activities such as the design and synthesis of new industrial products for the most varied uses and subsequently to follow their implementation in companies; to contribute to the testing and control of chemical production plants, as well as purification and depollution plants, ensuring their safety.
The industrial chemist can be used in chemical and petrochemical, pharmaceutical, metalworking industries and companies, related to different sectors (for example: plastics, dyes, detergents, adhesives, cosmetics, textiles, agri-food, energy) or operating in the environmental field. In the public sector, graduates in Industrial Chemistry can work in technical and ecological offices of local authorities, in customs laboratories, in those of hygiene and prophylaxis and analysis or in accident prevention services at work.

In addition, in particular, graduates will be in possession of knowledge suitable for carrying out professional activities and related functions in the following employment areas:
- Research and Development of Products, Processes (carrying out laboratory tests for the development of new products, processes and formulations and the improvement of existing ones in compliance with current regulations and safety standards);
- Management and Operation of Production Plants (management of the operation of plants in compliance with safety and the environment);

For the graduate of this class is expected to be enrolled in the Register of the National Federation of the Orders of Chemists and Physicists as a Chemist Iunior, upon passing the State Exam.

Initial knowledge required

Requirements and knowledge required for access
Candidates with a high school diploma or an equivalent qualification obtained abroad, recognized as suitable, are eligible for the Bachelor's degree program in Chemistry.

Basic knowledge in mathematics and the ability to make simple logical deductions, not exceeding the competence levels provided by secondary education, are also required.

Methods of verification of knowledge and personal preparation
The Bachelor's degree program in Industrial Chemistry has open access. Admission to the program involves a mandatory, yet non-selective, test to be taken before enrollment. This test aims to assess the initial preparation of students in terms of minimum requirements in basic scientific disciplines. The entrance exam involves passing a TOLC (Test On Line CISIA), which can be taken at the University of Milan or any other university participating in the CISIA (Consortium of Integrated Systems for Access). Registration for the TOLC is done directly on the CISIA website (www.cisiaonline.it).
The TOLC valid for enrollment in the Industrial Chemistry degree program is the TOLC-S, consisting of the following sections: Basic Mathematics (20 questions - 50 minutes), Reasoning and Problems (10 questions - 20 minutes), Comprehension of Text (10 questions - 20 minutes), Basic Sciences (10 questions in chemistry, physics, and geology - 20 minutes), English (30 questions - 15 minutes). Each question has 5 possible answers, of which only one is correct.
Score: +1 for each correct answer, -0.25 for each incorrect answer, 0 for each unanswered question.
For further details on the structure and topics of the test, please visit the following link: https://www.cisiaonline.it/area-tematica-tolc-scienze/struttura-della-prova-e-syllabus
The result of the English section does not replace the assessment of English language proficiency required by the degree program for obtaining related credits (see the Language Exams section) but serves as self-assessment for the student.
Students who have taken the TOLC-S and intend to use it to access the Industrial Chemistry Bachelor's degree program at the University of Milan must register on the degree program's website for enrollment within the deadlines specified in the announcement. For more details on the announcement, deadlines, and admission/enrollment procedures, it is recommended to consult the page https://www.unimi.it/en/study/bachelor-and-master-study/degree-programme-enrolment/enrolment-first-degree-programme

Access for transfer or for students who have already graduated
Students already enrolled in a Degree Course of the University of Milan, of another University or already graduated, can be exempted from the test only if they possess the necessary requirements to be admitted to years subsequent to the first of the edition of the Course. Degree reserved for students enrolled up to the 2023-2024 academic year, i.e. at least 30 ECTS attributable to exams of the 1st year of the course, of which 9 can be validated for the purposes of the Mathematics Institutions exam.
For this purpose, a specific request for prior career evaluation must be submitted by accessing the online service indicated in the admission notice. Interested parties must declare all the exams taken with the relevant sectors, credits and grades and attach the course programmes. For further details on the procedure, please refer to the announcement.
The practice will be examined by the CD Transfer Commission. In the event that the applicant is not eligible for years following the first, the student will have to take the initial preparation assessment test.
The requests for evaluation, accompanied by the programs of the exams taken, must be submitted without exception by the date that will be published in the notice and the outcome of the evaluation will be communicated via e-mail.
Students admitted to years subsequent to the first will be able to enroll within the deadlines and with the methods specified in the announcement.
Students admitted to the first year, in addition to taking the aforementioned test to verify initial preparation, will have to submit the application for admission, as indicated in the announcement.
Similarly, to speed up the paperwork process, all requests for equivalence of exams taken and/or recognition of previous careers must be accompanied by the programs of the exams taken.

Additional training obligations (OFA) and modalities for OFA recovery
Freshmen who do not achieve a score of 10 or higher in the Basic Mathematics module will be assigned Additional Training Obligations (OFA). For students with OFA, support activities will be organized from October to December, followed by a recovery test (to be taken within the month of January of the following calendar year of enrollment) in which the student must demonstrate improved preparation. In the absence of this evidence, the student cannot take any exams in the first year before passing the Institutions of Mathematics exam, excluding the 3 CFUs related to English language proficiency.

Compulsory attendance
Attendance is mandatory for laboratory activities, and strongly recommended in all other cases.

Internship criteria
At the end of the course of study, a compulsory internship (12 CFU) will be carried out in the manner indicated below. The internship activity is divided into:
1) Internal internship, consisting of a chemical activity carried out by the student at the Department of Chemistry of the University of Milan or the Departments connected to the Faculty of Science and Technology of the University of Milan under the guidance of a Supervisor, possibly assisted by a Co-Supervisor.

2) External internship, consisting of a chemical activity carried out by the student at the Departments connected to other Faculties of the University of Milan, or at public or private bodies or companies, under the guidance of a Manager (external Supervisor) and the supervision of a Tutor (internal Supervisor).

To start the internship the student must have achieved at least 126 credits.

The submission of the application can take place until the 1st day of each month for entry into the internship - unless not approved by the Board of Directors - on the 20th day of the same month, with the sole exception of the month of August.
The application for admission must be sent to the Didactic Office of the Department of Chemistry following the instructions and on the appropriate form available on the website https://chimicaindustriale.cdl.unimi.it/it/studiare/stage-e-tirocini
In the case of external internships at institutions or companies, students must contact the Thesis and Internship Commission in time to start the authorization procedure. In this regard, please consult the appropriate regulation, which can be found on the website of the CdS.
Students who are admitted to carry out the internship within the Erasmus project must apply before leaving for the destination university. In this case, the ECTS requirement is waived provided that the students have reached, on return, the 126 ECTS through exams taken abroad. Otherwise, the internship will not be valid for the purpose of obtaining the qualification.

The Supervisor is the guarantor towards the Academic Board of the activity assigned to the student in his internship and its correct performance.
Supervisor can be all professors and researchers, who carry out teaching activities of a chemical nature, belonging to the Academic Board or the Department of Chemistry or belonging to the Departments connected to the Faculty of Science and Technology. The Supervisor may be assisted by a Co-Supervisor.

They can be Internship Co-Supervisors, in addition to all the Teachers included in the category of Official Speakers:
- Official Professors of other Universities and Polytechnics, including foreign ones,
- graduates declared experts in the subject,
- employees of the University of Milan, classified in the role of non-teaching staff with a level equal to or higher than D and declared experts in the subject;
- C.N.R. researchers working within the Department of Chemistry;
- experts designated by the structures hosting external traineeships.

Special cases may be taken into consideration by the CD, if persons of particular scientific-technical relevance are involved. In this case, the Supervisor must briefly document in writing the specific competence of the proposed Co-Supervisor on the topic of thesis research.

In the case of an external internship, in addition to the Internal Supervisor, there is an External Supervisor (or Guardian) who is the didactic-organizational manager of the internship activity and is identified by the company hosting the internship.

Any anomalous cases will be examined by the Thesis and Internship Commission, which will formulate its decisions and submit them to the approval of the Academic Board.

Degree programme final exams

The final exam, which allows you to acquire the last 3 credits, consists in the discussion of a written report, prepared by the student under the guidance of the speaker, inherent in the activity carried out in the internship. This paper must relate to a theoretical or experimental activity carried out independently by the student in research groups or companies, during the internship period, and shall document the fundamental aspects of the work carried out in relation to the current state of knowledge in the field of chemistry.

SESSIONS FOR GRADUATION EXAMS
- July 2025
- October 2025
- December 2025
- February 2026
- April 2026

Notes

In order to obtain their degree, students must be proficient in English at a B1 level under the Common European Framework of Reference for Languages (CEFR). This proficiency level may be certified as follows:
- By submitting a language certificate attesting B1 or higher level in English and issued no more than three years before the date of submission. You will find the list of language certificates recognized by the University at: https://www.unimi.it/en/node/39322). The certificate must be uploaded during the enrolment procedure, or subsequently to the portal http://studente.unimi.it/uploadCertificazioniLingue;
- By taking a placement test offered by the University Language Centre (SLAM) between October and December of the first year. Students who fail the test will be required to take a SLAM course.

The placement test is mandatory for all those who do not hold a valid certificate attesting to B1 or higher level.
Those who have not taken the placement test by the end of December or fail the end-of-course exam six times must obtain the necessary certification privately before graduating.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organisations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

The University of Milan is a member of the 4EU+ European University Alliance that brings together eight public multidisciplinary universities: University of Milan, Charles University of Prague, Heidelberg University, Paris-Panthéon-Assas University, Sorbonne University of Paris, University of Copenhagen, University of Geneva, and University of Warsaw. The 4EU+ Alliance offers integrated educational pathways and programmes to promote the international mobility of students (physical, blended and virtual).

Study and internships abroad

As part of the study plan, students can participate in the Erasmus programme projects activated for the Degree Course. In particular, under the Erasmus+ programme, students can choose from 16 European partner universities. At these locations, students can obtain training credits by following courses and passing the relevant exams, or through the performance of part or all of the final internship. The acquisition of credits is subject to the approval, by the Teaching Board, of a specific study plan (Learning Agreement) and to the passing of the exams at the foreign university.
Interested students are kindly requested to make an appointment with the Tutor for International Mobility and Erasmus (prof. Emma Gallo, Tel. 02503 14374; E-mail: emma.gallo@unimi.it) for the investigation of the files.
Students can also participate in numerous seminar meetings with foreign lecturers.

How to participate in Erasmus mobility programs

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
- Academic career
- the candidate's proposed study programme abroad
- his/her foreign language proficiency
- the reasons behind his/her application

Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.

The University organises informative meetings to illustrate mobility opportunities and rules for participation.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).
https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti;
Student Desk booking through InformaStudenti

1st COURSE YEAR (disactivated from academic year 2025/26) Core/compulsory courses/activities common

Learning activity		Ects	Sector
Analytical chemistry with lab		12	CHIM/01
Complements of mathematics and calculus (F6X)		6	MAT/09, MAT/01, MAT/02, MAT/03, MAT/04, MAT/05, MAT/06, MAT/07, MAT/08
English assessment B1 (3 ECTS)		3	ND
Fundamentals of mathematics		9	MAT/09, MAT/01, MAT/02, MAT/03, MAT/04, MAT/05, MAT/06, MAT/07, MAT/08
General and inorganic chemistry with lab		12	CHIM/03
General physics		9	FIS/08, FIS/07, FIS/06, FIS/05, FIS/04, FIS/03, FIS/02, FIS/01
Organic chemistry I		8	CHIM/06
	Total compulsory credits	59	

2nd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Analytic chemistry II with lab		12	CHIM/01
Chemical kinetics with lab		6	CHIM/02
Inorganic chemistry with Lab		12	CHIM/03
Organic chemistry II		7	CHIM/06
Organic chemistry lab		9	CHIM/06
Physical chemistry I		6	CHIM/02
Physical chemistry II		6	CHIM/02
	Total compulsory credits	58	

3rd COURSE YEAR (available as of academic year 2026/27) Core/compulsory courses/activities common

Learning activity		Ects	Sector
Biological chemistry		6	BIO/10
Chemical plants with lab		12	ING-IND/25
Fundamentals of Industrial Chemistry		6	CHIM/04
Fundamentals of polymer science with lab		6	CHIM/04
Physical chemistry Industrial		6	CHIM/02
Training		12	NA
	Total compulsory credits	48	

Elective courses

In the third year of the course, the student must acquire 12 ECTS by freely choosing among all the activities and teachings activated by the University that are functional to the training path of the Bachelor Degree in Industrial Chemistry. Students are advised to take advantage of this list of 6 ECTS courses designed specifically for the degree course.

Analysis applied to sustainable processes and industrial products	6	CHIM/01
Industrial surface treatment technologies	6	CHIM/02
Methods and technologies for organic synthesis	6	CHIM/06
Technologies for biomass valorisation	6	CHIM/03

End of course requirements

Final exam		3	NA
	Total compulsory credits	3	

COURSE PROGRESSION REQUIREMENTS

- The exams indicated as the first course must be taken before the corresponding exams indicated as the second course.
- The "Fundamentals of mathematics" and "General and inorganic chemistry with lab" exams must be taken before the 2nd year and 3rd year exams.
- The "General Physics" and "Complements of mathematics and calculus" exams must be taken before the 3rd year exams.
- The "Organic Chemistry I" exam must be taken before the "Organic chemistry lab", "Biological Chemistry" and "Fundamentals of polymer science with lab" exams.
- The “Physical Chemistry I” and “Chemical kinetics with lab” exams must be taken before the “Physical chemistry Industrial” exam.

However, it is advisable to take the exams of each semester before taking those of the following semesters.

Learning activity	Prescribed foundation courses	O/S
Biological chemistry	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory

	Organic chemistry I	Core/compulsory
Physical chemistry I	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Physical chemistry II	Physical chemistry I	Core/compulsory
	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Inorganic chemistry with Lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Chemical plants with lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory
Organic chemistry II	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	Organic chemistry I	Core/compulsory
Physical chemistry Industrial	Physical chemistry I	Core/compulsory
	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory
	Chemical kinetics with lab	Core/compulsory
Analytic chemistry II with lab	Analytical chemistry with lab	Core/compulsory
	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Organic chemistry lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	Organic chemistry I	Core/compulsory
Chemical kinetics with lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Fundamentals of polymer science with lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory
	Organic chemistry I	Core/compulsory
Fundamentals of Industrial Chemistry	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory