



UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2020/21
BACHELOR
Industrial Chemistry (Class L-27)
Students enrolled in the academic year 2020-2021

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:	1st , 2nd , 3rd
Access procedures:	Cap on student, student selection based on entrance test
Course code:	F6X

PERSONS/ROLES

Head of Study Programme

Prof. Luigi Falciola

Degree Course website

<https://chimicaindustriale.cdl.unimi.it/it>

Via Golgi, 19 - 20133 MILANO Phone 02 50314419 dal lunedì al venerdì dalle ore 10 alle ore 12, in altri orari previo appuntamento Email: didattica.dipchi@unimi.it

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

Via Celoria, 18 - 20133 MILANO <https://www.unimi.it/it/studiare/servizi-gli-studenti/segreterie-infostudenti/sedi-e-orari-segreterie-studenti> <https://www.unimi.it/it/node/359/>

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CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

General aims and objectives of the course are the followings:

- To develop in our graduates the qualities needed to become the next generation of high quality chemists operating in chemical research, chemical industry and in the teaching of chemistry
- To make our students realize that chemistry is a fundamental discipline, central to the development of a modern and concerned society
- To provide intellectual stimuli and practical skills for highly determined graduates willing to play leading roles and undertake brilliant careers in the society

In particular, graduates in Industrial Chemistry are expected to gain the following skills:

- The basic knowledge in mathematics and physics to deal with chemical principles and concepts on a scientific basis.
- The ability to understand the practical implications of a wide range of chemical phenomena and to deal with them at the applied level.
- The ability to understand the various aspects of chemical production and its impact on the society.
- The creativity to develop new practical solutions to chemical production-related problems, with particular emphasis on

sustainable development and economic benefits.

- The open-minded attitude necessary to collaborate with scientists of culturally-related disciplines.

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, perform experimental procedures, and to compile reports about it with reference to: synthesis and characterization of compounds, techniques and methodologies of physical-chemical (e.g., electrochemical), the recognition of the molecular properties and structural products and materials, safe use and disposal of chemicals.

Acquisition of self-aware autonomy of judgement with reference to: evaluation and interpretation of experimental data, laboratory, design, programming and conduct of experiments, formulation, and solution of analytical problems, putting knowledge of specific chemical in their relations with other disciplines, procurement, and screening of sources of information, data and literature on chemistry.

Graduates of Industrial Chemistry should be able to communicate the results of their analyses and evaluations clearly and effectively, using the most widely used language in the context of international (English) and using, with a mastery of 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 appropriate skills for the development and updating of skills in bibliographic research, databases and other information on the internet, the acquisition of autonomy to consult advanced textbooks and journals specialised in the fields of research in chemistry and scientific disciplines, and the ability to be readily integrated into the world of work.

Professional profile and employment opportunities

The students with the degree in Industrial Chemistry would be entitled to work in public and private-owned laboratories as highly qualified technicians. They could operate as assistants of more specialized personnel in the development of new products and/or new materials, collaborate in the design and realization of novel protocols for industrial preparations. They are trained for working on a chemical plant, take care of the validation and control of an established process and in the management of logistics issues, with a special attention devoted to the safety of plants, processes and chemicals. They could find positions in chemical industry, for example oil companies, polymer and material industries, and in public agency. They can also apply for Master programmes, preferentially in Industrial Chemistry and Management. On average, ca. 70% of our students do so, after receiving the degree in Industrial Chemistry.

Notes

ADMISSION REQUIREMENTS

Basic knowledge of mathematics and chemistry, as well as the ability to make simple logical deductions according to levels of competence not higher than those achieved through secondary-school education.

Enrolment in the Bachelor's degree programme in Industrial Chemistry is capped in order to meet high-quality teaching standards relative to the available resources. Therefore, admission is subject to a TOLC - CISIA Online Test. There are 90 places available for the first year of the programme.

You can sit for the TOLC test at the University of Milan or any other member university of CISIA (inter-university consortium for integrated access systems). You can register to the TOLC test on the CISIA website (www.cisiaonline.it).

The test providing access to the degree programme in Industrial Chemistry is TOLC-S, consisting of the following sections: Basic mathematics (20 questions - 50 minutes), Reasoning and problems (10 questions - 20 minutes), Reading comprehension (10 questions - 20 minutes), Basic sciences (chemistry, physics and geology - 10 questions - 20 minutes).

Each question has 5 answer options, of which only one is correct.

Score: correct answer +1, wrong answer -0.25, no answer 0.

For information on the test structure and topics, visit: <https://www.cisiaonline.it/area-tematica-tolc-scienze/struttura-della-p...>

In addition to taking the TOLC-S test, candidates must apply for admission to the merit ranking based on the test score. The winners will be able to enrol, in compliance with the deadlines set out in the call for applications.

The selection is divided into several time windows, beginning in spring and ending in early September.

For more details on the calls for applications, deadlines and procedures for admission to the ranking list, please review the page: <https://www.unimi.it/en/study/bachelor-and-master-study/degree-programme-enrolment/enrolment-first-degree-programme>

Students who have not scored at least 10 in the Basic Mathematics module will have to meet additional learning requirements (OFA).

The TOLC test includes an additional English section, consisting of 30 questions to be answered in 15 minutes. The score in this section does not affect the merit ranking, nor does it replace the for-credit assessment of English language proficiency required by the degree programme. However, it is a student self-assessment.

Remedial activities and tests

Students with additional learning requirements will have to carry out remedial activities organised by the University in the period October-December, and then take a test to prove they have filled their gaps. Otherwise, they will not be able to take

any first-year exams before passing the Fundamentals of Mathematics exam, with the exclusion of the 3 credits (CFU) for English language proficiency.

To obtain the degree, students are required to demonstrate an English language proficiency at level B1 within the Common European Framework of Reference for Languages (CEFR). This level can be assessed in the following ways:

- by submitting the language certificate achieved no more than three years prior to the submission, at level B1 or higher, recognised by the University (the list of recognised language certificates can be found at: <https://www.unimi.it/en/node/297/>). The language certificate must be uploaded during the admission process;
- by taking the Placement Test, organised by SLAM exclusively during the first year, from October to December. Students who fail to reach level B1 will have to attend an English course organised by SLAM. The Placement Test is compulsory for all students who do not have a valid language certificate.

Students who do not take the Placement Test within the deadline and students who fail the SLAM end-of-course test within six attempts will have to obtain a language certificate within the year in which the language exam is scheduled.

TRANSFERS AND GRADUATE STUDENTS

Those already enrolled in a degree programme at the University of Milan, or another university, as well as graduate students, can only be waived from the test requirement if they meet the requirements for admission to years following the first, i.e. they have earned at least 30 CFU for first-year exams, of which 9 available as transfer credits for the Fundamentals of Mathematics exam.

For this purpose, candidates will have to submit a specific application to the Academic Office of the Department of Chemistry attaching a self-certification of their academic career, including exams taken, syllabi and CFU earned.

The case will be reviewed by the degree programme's Transfer Commission. Any applicants who cannot be admitted to years following the first will have to take the test and rank high enough to be admitted to the programme.

Applications, possibly including exam syllabi, must be submitted by 10 JULY 2020 to the Academic Office of the Department of Chemistry, at Via Golgi 19, tel. 0250314419, fax 0250314418, email didattica.dipchi@unimi.it. The review outcome will be posted on the website <https://chimicaindustriale.cdl.unimi.it/it> by the end of July. In the event of a positive outcome, the candidate will have to apply for enrolment as set out by the Student Registrar division, and claim transfer credit for their previous career attaching exam syllabi.

Similarly, all applications for exam equivalence/career recognition must attach exam syllabi in order to expedite procedures.

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 30 different 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 organizations.

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

Study and internships abroad

Students enrolled in Industrial Chemistry course are encouraged to apply to the Erasmus Plus actions, where various positions are available in 20 European universities. They can earn their credits by following courses and/or by performing part of their experimental thesis abroad. Before leaving, students must submit a Learning Agreement to be approved by the Teaching Board: this approval is mandatory for the acquisitions of the credits.

How to participate in Erasmus mobility programs

How to participate in Erasmus+ mobility programmes

The students of the University of Milan can participate in mobility programmes, which last 3 to 12 months, through a public selection procedure.

Ad hoc commissions will evaluate:

- 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 generally begins around February each year with the publication of a call for applications specifying the destinations, with the respective programme duration, requirements and online application deadline.

Every year, before the deadline for the call, the University organizes informative meetings to illustrate opportunities and rules for participation to students.

Erasmus+ scholarship

The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which is 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.

Learn more at <https://www.unimi.it/en/international/study-abroad/studying-abroad-erasmus>

International Mobility Office

Via Santa Sofia 9 (second floor)

Tel. 02 503 13501-12589-13495-13502

E-mail: mobility.out@unimi.it

Desk opening hours: Monday to Friday 9 am - 12 noon

1st COURSE YEAR Core/compulsory courses/activities common		
Learning activity	Ects	Sector
Analytic 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	
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	7	CHIM/06
	Total compulsory credits	58
2nd COURSE YEAR Core/compulsory courses/activities common		
Learning activity	Ects	Sector
Analytic chemistry II with lab	12	CHIM/01
Inorganic chemistry with Lab	12	CHIM/03
Laboratory of physical chemistry	6	CHIM/02
Organic chemistry II	7	CHIM/06
Organic chemistry lab	10	CHIM/06
Physical chemistry I	6	CHIM/02
Physical chemistry II	6	CHIM/02
	Total compulsory credits	59
3rd COURSE YEAR Core/compulsory courses/activities common		
Learning activity	Ects	Sector
Biological chemistry	6	BIO/10
Chemical plants with lab	12	ING-IND/25
Industrial chemistry	6	CHIM/04
Macromolecular chemistry	6	CHIM/04
Physical chemistry Industrial	6	CHIM/02
Training	12	
	Total compulsory credits	48
Activites chosen by the student		
Final learning activities		
Final exam	3	
	Total compulsory credits	3

COURSE PROGRESSION REQUIREMENTS

- The exams of "institutions of mathematics" and "general and Inorganic Chemistry / Laboratory of general and inorganic chemistry" must be taken before the examinations of the 2nd and 3rd year.

- The exams of "General Physics" and "complements of mathematics and numerical calculation" must be taken before the exams of the 3rd year.
- The exams of "Organic Chemistry I" must be carried out before those of "Laboratory of organic chemistry", "biological chemistry" and "Macromolecular Chemistry".
- "Physical Chemistry I" and "Laboratory of physical chemistry" tests must be carried out prior to "industrial Physical Chemistry".
- The exams indicated as the course must be taken before the corresponding examinations indicated as the course.

It is advisable, however, 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
	Organic chemistry I	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory
Physical chemistry I	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
Laboratory of physical chemistry	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 lab	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	Organic chemistry I	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
	Laboratory of physical chemistry	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
Macromolecular chemistry	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory
	General physics	Core/compulsory
	Organic chemistry I	Core/compulsory
	Complements of mathematics and calculus (F6X)	Core/compulsory
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
Analytic chemistry II with lab	Analytic chemistry with lab	Core/compulsory
	General and inorganic chemistry with lab	Core/compulsory
	Fundamentals of mathematics	Core/compulsory