



UNIVERSITA' DEGLI STUDI DI MILANO
MANIFESTO DEGLI STUDI A.A. 2020/21
LAUREA MAGISTRALE IN
INDUSTRIAL CHEMISTRY (Classe LM-71)
Students enrolled from the academic year 2020-2021

GENERALITA'

Classe di laurea di appartenenza:	LM-71 SCIENZE E TECNOLOGIE DELLA CHIMICA INDUSTRIALE
Titolo rilasciato:	Dottore Magistrale
Durata del corso di studi:	2 anni
Crediti richiesti per l'accesso:	180
Cfu da acquisire totali:	120
Annualità attivate:	1°, 2°
Modalità accesso:	Libero con valutazione dei requisiti di accesso
Codice corso di studi:	F7Y

RIFERIMENTI

Presidente Collegio Didattico

Prof. Luigi Falcicola

Sito web del corso di laurea

<https://industrialchemistry.cdl.unimi.it/en>

Department of Chemistry

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

Erasmus and international mobility tutor

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Main Student Office

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Master's degree admission tutor

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Student Office of the Department of Chemistry

Via Golgi 19 - 20133 MILANO From Monday to Friday from 10:00 to 12:00, by appointment outside of these hours available upon request Email: helpdesk.chemistry@unimi.it

Study plan, transfer and credit recognition tutor

Pierluigi Mercandelli Tel. 02503 14447 <https://www.unimi.it/en/ugov/person/pierluigi-mercandelli> Email: pierluigi.mercandelli@unimi.it

Study plans and transfers Commission

Pierluigi Mercandelli, Paola Fermo, Clelia Giannini, Sandra Rondinini, Maria Vitoria Dozzi, Lucia Invernizzi

Wellcome desk

International students can contact the Welcome Desk directly by writing to international.students@unimi.it
<https://www.unimi.it/en/international/coming-abroad/international-students-office-welcome-desk>

CARATTERISTICHE DEL CORSO DI STUDI

Premessa

The Master's Degree Course in Industrial Chemistry aims at preparing chemists with a good knowledge of theory and practical aspects of the industrial production in different areas of chemistry, specifically concerning the product-process relationship, as well as of economics and management, and learn to work independently and to take full responsibility of projects and structures.

The Master's Degree program in Industrial Chemistry, entirely taught in English, is designed to train high-quality human capital, capable to take on the challenges of the global economy, favoring access of graduates in Industrial Chemistry to the world labor market. The key role given to English in this learning program is justified by the fact that English has long since represented a global communication tool in economy and society, which will contribute to the achievement of the prefixed quality objectives.

EUROMASTER®. The Master's Degree Course in Industrial Chemistry (up to 2013/14, Chimica Industriale e Gestionale) of the Università degli Studi di Milano has been among the first ones in Italy to gain the EuroMaster Label. The EuroMaster Label is assigned by a special jury purposely appointed by the European Thematic Association, gathering European universities and chemical societies. The EuroMaster Label certifies the educational qualification provided by the Master's Degree Course in Industrial Chemistry as a master's degree recognized by the European Universities and gives the right to access the post-graduate courses of chemistry at the European level.

Obiettivi formativi generali e specifici

The Master's Degree program in Industrial Chemistry complies with the European standards of reference for Sciences and Technologies of Industrial Chemistry and provides technical skills in the disciplines of chemistry and industrial chemistry and in their applications.

The educational program of the master's degree course is designed to provide:

- skill related to self-directed and independent work, enabling to hold positions of full responsibility in the implementation of industrial and research projects and structures;
- knowledge and understanding to undertake professional careers in the area of industrial chemistry, by independently managing diversified activities, such as the characterization of new products and materials, the experimentation of new technologies, and the activities related to the development and pilot phase in view of the industrial production;
- the ability to interact during the decision-making process with different corporate functions (engineering, marketing etc.) involved in the process of research, development and marketing of active principles, especially those characterized by high added value;
- the competencies required to work in the creative process and in the managerial and operational phases of research in chemistry and industrial chemistry either in public or private laboratories (either European or extra-European), research centers, research and development organizations; to participate in the theoretical and practical development of new chemical technologies and to meet requirements of research and development, quality control within specific legal frameworks or production processes in industries and public institutions;
- written and oral communication skills, in English to enable students to communicate independently and fluently with foreign partners.

Risultati di apprendimento attesi

Graduates in Industrial Chemistry have the skills and knowledge to undertake highly qualified professional activities in business management and in the operation of research laboratories in the field of chemistry, industrial and pharmaceutical chemistry and possess the knowledge to develop industrial chemical processes from the laboratory scale to the plant pilot.

Their competences in corporate management are characterized by high knowledge of science and technologies of chemistry and industrial chemistry. They are capable to organize the research work, to define the development lines and their plans, to ensure integration of the different research sectors, to guarantee the scientific upgrade as well as to verify the results obtained and to promote their development and application and will have the ability to adapt to the continuous evolution of the chemical and disciplines and to interact with professional having similar background.

Profilo professionale e sbocchi occupazionali

Graduates in Industrial Chemistry will be able to carry out, among others, the following activities: promotion and development of the scientific and technological innovation; planning and management of industrial technologies; holding functions of high responsibility in the industrial, environmental, health care, and public service sectors.

Graduates in Industrial Chemistry are expected to find employment in: research and development in chemical industries; design and management of pilot plants, chemical plants; industries and research centers working in diversified sectors of either conventional or innovative fields.

The acquired competences allow graduates to have open access to several industrial sectors such as those of polymeric materials, food industry, agrochemicals, additives, auxiliaries, materials for electronics, ecology, intellectual property (patents) and business management.

The Master's Degree in Industrial Chemistry constitutes a preferential title to access the PhD programme in the area of industrial chemistry.

For the graduate of this class, enrollment in the National Order of Chemists and Physicists is possible, after passing the State Exam.

Conoscenze per l'accesso

The curricular prerequisite to access the Master's Degree Course in Industrial Chemistry are those peculiar of the L-27 class of degree courses, and in particular:

- at least 20 credits in disciplines of mathematics, information technology and physics
- at least 70 CFU in discipline groups belonging to the distinguishing areas included in the L-27 Class Table:
- analytical and environmental chemistry CHIM/01 and CHIM/12;
- inorganic and physical chemistry CHIM/03 e CHIM/02

- industrial and technology CHIM/04, CHIM/05 and ING-IND/21-22, ING-IND/25;
- organic chemistry and biochemistry CHIM/06, BIO/10-12

Those credits will be fully recognized to graduates of the undergraduate program of class L-27 of the University of Milan. All other students must demonstrate to have the curricular requirements of the graduates of the class L-27. Different curricular profiles will be evaluated by the Commission for the Access to Industrial Chemistry.

A minimum English language proficiency at level B1 within the Common European Framework of Reference for Languages (CEFR) is an admission requirement.

The English level B1 is assessed by the University Language Centre SLAM throughout the admission process in the following ways:

- language certificate achieved no more than three years prior to the submission, at level B1 or B2 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;

- level of English assessed by SLAM (and/or through a computer-based test) during the bachelor's degrees obtained at the University of Milan. English levels B1 and B2 achieved no more than four years previously are deemed valid. The verification is automatic with no need to attach any certificate during the application phase;

- entry test, organised by SLAM, which will take place on September, 24th, 2020, at 15:30 in room 700 (via Colombo 46, Milano) for graduate students and on December, 10th, 2020, at 14:30 in via S. Sofia 11, Milano exclusively for students who are about to graduate or have graduated after the September's date of examination.

If the language certificate or level is not valid, the candidate will be summoned for the entry test through the admission procedure. Candidates who fail the entry test will not be admitted to the master's degree programme and cannot take further tests.

Struttura del corso

All teaching activities (lessons, exercises, laboratory activities, seminars, research activities etc) are computed in CFU (credits); 1 CFU corresponds to 25 hours of study of the student, and precisely:

- for lessons: 1 CFU means 8 hours of teaching and 17 hours of individual study
- for exercises and laboratory activities, 1 CFU means 16 hours of practical activities and 8 hours on individual study
- for thesis laboratory, 1 CFU means 25 hours of lab. work.

To graduate, students must acquire 120 CFU

Biblioteche

The Biology, Informatic, Chemistry and Physic Library (BICF) is located in via Celoria 18.

For information on the Library services for students you may refer to the website of the facility

<https://www.unimi.it/en/study/libraries>

<http://www.sba.unimi.it/en/libraries/13453.html>

Note

For information on course schedules, course contents and all matters related to teaching please refer to the Student Office of the Department of Chemistry (main entrance, via Golgi 19 – open to the public on weekdays from 10:00 to 12:00; appointments outside of these hours are available upon request.

Articolazione degli insegnamenti

The master degree in Industrial Chemistry is structured in Semesters The subdivision of the courses into 1st- and 2nd-year semesters is:

1st YEAR

1st Semester

Advanced industrial chemistry with Laboratory (9 CFU), Economics and management (6 CFU), Chemical processes and industrial plants (6 CFU), 1 course from Related and Integrative

2nd Semester

Students must earn 9 CFU by selecting 1 course from those included in Table 1, and 24 CFU by selecting 3 courses of 6 CFU taken from Table 2 and 1 course from Related and Integrative

2ND YEAR

1st Semester

Students must earn 18 CFU by selecting 1 course of 6 CFU from Table 2, and 2 freely selectable courses (included those held in Italian) of 6 CFU. and start the Thesis laboratory

2st Semester

Thesis Laboratory, preparation of the dissertation and final defense of the Thesis

Students must also earn 3 CFU of English Proficiency during the course of their studies

Prove di lingua / Informatica

TEST OF ADVANCED KNOWLEDGE OF LANGUAGES

To obtain the degree, students are required to demonstrate an English language proficiency at level B2 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 B2 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 January. Students who fail to reach level B2 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.

LEVEL OF ENGLISH ASSESSED THROUGH A COMPUTER-BASED TEST DURING THE BACHELOR'S DEGREES OBTAINED AT THE UNIVERSITY OF MILAN.

English levels B2 achieved no more than four years previously are deemed valid. The verification is automatic with no need to attach any certificate during the application phase.

Obbligo di frequenza

It is mandatory to attend the Laboratory activities. In all the other cases the attendance is strongly suggested.

Modalità di valutazione del profitto

ASSESSMENT PROCEDURE OF THE LEARNING OUTCOMES

The schedule of the examination sessions for the assessment of the learning outcomes is available through the online UNIMIA services or at the websites

<https://www.unimi.it/en/node/130/>

For each course at least one session is scheduled for each of the following months: February, June, July, September, and January. Extra sessions might be scheduled in November and at the end of the Easter holidays.

TEACHING AGENDA

Lessons take place as follows:

- 1st Semester: October 1st, 2020 – January 23rd 2021-
- 2nd Semester: March 1st 2021 – June 12th 2021

FIXED DATES

- Students have to choose a complete study plan, to be submitted to the Student Bureau (according to the appropriate procedures) accordingly to scheduled dates

<https://www.unimi.it/en/node/122/>

<https://www.unimi.it/en/node/359/>

SESSIONS OF THE FINAL EXAM

- July 2021
- October 2021
- December 2021
- February-March 2022

Regole generali per iscrizione e ammissione agli appelli d'esame

EXAM ENROLMENT

To sit for an examination, the student must enroll for the relevant session, through the online services. More informations can be found at the sites

<https://www.unimi.it/en/node/130/>

Before (or contextually with) the enrolment the student must fill the online questionnaire for the evaluation of the relevant course.

Contextually with the exam enrolment, the student career is checked via the information system. It is strongly suggested to check the effective enrolment for the selected exam via the UNIMIA services (<https://www.unimi.it/en/study/student-services/technology-and-online-services/unimia>).

TEACHING EVALUATION

The online evaluation of a single course is mandatory and enables the enrolment for the said course. Students are strongly suggested to fill the questionnaire before the completion of the teaching activities of each course, even if they do not intend to take soon the exam. The evaluation questionnaire remains anonymous.

Remember that the deadline for enrolments is usually 5 days before the session.

EXAM RECORDING

Exams and tests are recorded electronically. Only the students correctly enrolled via the UNIMIA online services can be allowed to take any exam.

SPECIAL INSTRUCTIONS

- To take any exam or test, the student must have fulfilled the payment of taxes and contributions, must have passed possible propaedeutic exams, must have all the attendance certificates, where requested.

- It is forbidden to retake an already passed exam, even in the case of educational activities recorded in a previous career. The violation of the above rules implies the annulment of the exams by Rectoral act.

It is mandatory that, before any exam or test, the board of examiners verifies the personal identity of the candidate, who must exhibit a valid identification document. No student can be allowed to take any exam or test in the absence of an identification document.

Regole generali per iscrizione alle attività formative e/o laboratori

Students must enrol to Laboratories via internet at the UNIMIA online services: <https://www.unimi.it/en/study/student-services/technology-and-online-services/unimia>

Formulazione e presentazione piano di studi

CHOICE AND SUBMISSION OF THE STUDY PLAN

To favor the planning of the educational activities, Students are asked to fill a preliminary study plan to be presented to the Office for Secretary's office of the Study Programme, Department of Chemistry, before October 16th, 2020. Students will receive the necessary form at their admission interview or (for foreign students) at their arrival in the Department of Chemistry.

OFFICIAL STUDY PLAN

The submission of the study plan is mandatory. The OFFICIAL study plans, that might be different from the preliminary ones, must nonetheless be submitted at the 1st Year, via UNIMIA services (<https://www.unimi.it/en/study/student-services/technology-and-online-services/unimia>), within the term fixed by the Segreteria Studenti, accordingly to scheduled dates. For special cases a printed form is available, to be requested and submitted to Segreteria Studenti, Via Celoria, 18. The official study plans may be modified, if needed, in the subsequent years. The modified plans have to be submitted at fixed dates ONLY, as indicated by Segreteria Studenti. The submission/modification of study plans is NOT ALLOWED outside the fixed dates and by students not enrolled for the academic year.

NOTICE: For the admission to the final exam, the list of passed exams must correspond to the last approved official study plan. When applying for the admission to the final exam, in the case of discrepancy between the student's educational career and the relevant study plan, the student cannot be admitted to the final exam. For support and enquiries about the effective correspondence between passed exams and courses selected in the study plan students may refer to Office for Teaching, Department of Chemistry.

For information about dates and procedures for submitting the official study plan, please visit the relevant section of the UNIMI website.

Caratteristiche Tirocinio

RULES FOR THE THESIS LABORATORY AND THE FINAL EXAM

The Master Thesis is a written dissertation on original research activities, usually performed by the student during the 2nd year, under the guidance of a Relatore (Supervisor) and a Correlatore (Co-tutor if any). These activities are carried out in the laboratory indicated in the admission application. The Thesis Laboratory lasts at least one solar year, and includes the attendance at the courses scheduled in that year.

The Master Theses are:

- Internal Experimental Theses
- External Experimental Theses

Students are requested to earn 3 credits of English proficiency before they enter the laboratory thesis.

The Internal Experimental Theses are carried out at the Department of Chemistry of University of Milan and other Department belonging to the Faculty of Sciences and Technology. The External Experimental Theses are carried out at other university structures or at other public Institutions with adequate facilities. The possibility of an external Thesis is evaluated, case by case, by the Teaching Board of the Department of Chemistry.

To apply for an External Thesis the following documents must be provided:

- Justification of the application to an external experimental thesis (one printed page) signed by the student and undersigned by the Supervisor (an Official Supervisor, according to the rules further below)
- Detailed research plan (one printed page)
- A declaration of the referent person of the hosting structure about the availability to host at no-cost the student and to guarantee the use, free-of-charge, of any facility and instrumentation

The applications must be submitted well in advance, to obtain the approval of the Teaching Board

THESIS STARTING SESSIONS

The Theses can start on the first day of July, October, December and March. The applications – drafted on the specific form undersigned by the Supervisor – must be sent at the Student Office of the Department of Chemistry, by the first day of the month preceding the starting month, for the necessary approval of the Teaching Board.

OFFICIAL SUPERVISORS

The Master Thesis Supervisor is responsible to the Teaching Board for the scientific research activity assigned to the student and for the correct execution.

The Professors and Researchers in chemistry, afferent to the Teaching Board or to the Department of Chemistry or the Departments of the Faculty of Science and Technology, are eligible as Supervisors.

The Supervisor can be assisted by a maximum of two co-tutors.

CO-TUTORS

In addition to all the Professors and Researchers are eligible as co-tutors of Master Theses:

- The Professors and Researchers of other Universities and Polytechnic Schools, in Italy and abroad
- Persons with the Master Degree, with a recognized activity as experts
- The employees of Università degli Studi di Milano, enrolled as non-teaching personnel at D level or higher and having a recognized activity as experts
- The National Research Council (CNR) Researchers working within the Department of Chemistry
- The experts selected by the hosting institutions as referents for External Theses.

For any other case, the Teaching Board will consider the scientific and technical activity of the proposed co-tutor, on the basis of a brief description of the specific skills and expertise provided by the Supervisor.

The relevant forms may be downloaded from the website of the course of study.

Criteri di ammissione alla prova finale

For the admission to the final exam, the student must have passed all the exams in his/her study plan.

The final Exam is an oral discussion of the Master Thesis written dissertation performed at the presence of an official Committee of the Teaching Board.

Orario lezioni

The lecture timetable will be available on the url

<https://www.unimi.it/en/node/128/>

At the same links the app "lezioniunimi" for Android, IOS e Windows Phone can be downloaded.

ESPERIENZA DI STUDIO ALL'ESTERO NELL'AMBITO DEL PERCORSO FORMATIVO

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.

Cosa offre il corso di studi

Students enrolled in the 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.

Modalità di partecipazione ai programmi di mobilità - mobilità Erasmus

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>

For assistance, please contact:

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

MODALITA' DI ACCESSO: 1° ANNO LIBERO CON VALUTAZIONE DEI REQUISITI DI ACCESSO

Informazioni e modalità organizzative per immatricolazione

INFORMATION AND METHOD FOR ADMISSION TO OPEN ACCESS MASTER DEGREE IN INDUSTRIAL CHEMISTRY FOR ITALIAN AND FOREIGN STUDENTS

The Italian and foreign students with academic qualification awarded in Italy must submit applications for admission respecting the deadlines indicated in the "student area" of the Unimi web portal. Undergraduates who intend to graduate by December 31st, 2020 are also allowed to apply.

The presentation of the application form is compulsory and must be submitted electronically to the following address:
<https://www.unimi.it/en/study/bachelor-and-master-study/degree-programme-enrolment/enrolment-masters-programme>

Admission requires possession of minimum curriculum requirements and suitable personal skills (DM 270/04)

Istruzioni operative

CHECK OF PERSONAL SKILLS

The personal skills of each candidate will be ascertained through a Chemistry test and an interview on topics related to the subjects covered in the fundamental courses of the bachelor's degree in Industrial Chemistry. The interview may also be carried out before graduation (which, for the purpose of registration, has to be achieved by December 31st, 2020), subject to the curricular requirements.

The interview will be conducted by the Commission for the Access to the Master, composed by teachers appointed by the Teaching Board. The failure of the interview prevents the access to the MSc in Industrial Chemistry for the current year.

The Personal Skill will be verified by the following methods:

a) the European Chemistry Tests granted by the European Chemistry Thematic Network (<http://ectn.eu/committees/virtual-education-community/echemtest/>) for the assessment of expertise in Chemistry. The test includes questions, in English, with multiple answers, on topics of the four areas of Analytical, Inorganic, Organic, Industrial and Physical Chemistry. In order to pass the test, students must answer correctly to at least 16% of the questions in each of the four thematic areas. To perform the test, the Candidate will be asked to show a valid identification document.

b) After passing the test, an interview with the Access Commission will take place on topics related to fundamental aspects of core disciplines of the degree in Industrial Chemistry. The test to verify the personal skills is selective even in the case the curricular requirements listed above are recognized; the negative outcome prevents the access for the current year.

FOR A BETTER TEACHING PLANNING ALL CANDIDATES, INCLUDING THOSE EXPECTING to graduate before, December 31st, 2020, ARE STRONGLY SUGGESTED TO APPLY FOR INTERVIEW in September.

For admission in 2020/21 the EchemTest and the interviews to ascertain the curricular requirements and the adequacy of personal skills of candidates will take place on the following dates:

- September 24th, 2020, at 8:30 a.m., at the rooms of the Didactic Sector of Celoria street 20, Milan. The next day there will be the interview to verify the possession of the curricular requirements and the adequacy of the personal preparation of the candidates.
- December 11th, 2020, at 8.30 a.m., at of the Didactic Sector of Celoria street 20, Milan, followed by the interview to verify the personal preparation of candidates

It is advisable to check for any possible updates about date at the website of the course of study.

Foreign candidates who can not attend the official selection (EChemTest plus interview) for visa problems will be contacted by the Access Commission for evaluation of their CVs and a Skype interview.

IT IS ADVISABLE TO CHECK FOR ANY POSSIBLE UPDATES ABOUT DATES ON THE ECHEMTEST AND THE INTERVIEWS AT THE WEBSITE OF THE COURSE OF STUDY

N° posti riservati a studenti extracomunitari non soggiornanti in Italia

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Note

ENROLLMENT IN INDUSTRIAL CHEMISTRY MASTER

Only graduates who have successfully passed the verification test can be enrolled in Industrial Chemistry.
The registration will take place after 5 working days and under the terms and conditions indicated at the website
<https://www.unimi.it/en/node/92/>

Students of the University of Milan who have applied for admission and who have acquired credits in excess of the 180 required during the bachelor's degree, taking courses and / or laboratories provided for in the master's degree program and passing the related exams, may request the recognition for the achievement of the 120 CFU required.

1° ANNO DI CORSO Attività formative obbligatorie				
Erogazione	Attività formativa	Modulo/Unità didattica	Cfu	Settore
1 semestre	Advanced industrial chemistry with lab		9	CHIM/04
1 semestre	Chemical processes and industrial plants		6	CHIM/04
1 semestre	Economics and management		6	SECS-P/08
Totale CFU obbligatori			21	
Attività a scelta				
TABLE 1 - DISTINCTIVE COURSES FROM 9 CFU				
Student must earn 9 CFU by selecting one of the following items				
2 semestre	Applied organic chemistry with lab		9	CHIM/06
2 semestre	Energy: source, conversion and storage with lab		9	CHIM/02
2 semestre	Inorganic materials with lab		9	CHIM/03
2° ANNO DI CORSO Attività a scelta				
FREE CHOICE COURSES				
The student must earn 12 credits by choosing freely between all the teachings activated, offered by the University, provided they consistency with the educational project, even if they are held in Italian. However, it is strongly recommended to use distinctive or, as appropriate, elective or integrative courses of the Related and Integrative courses of Master Degrees in Industrial Chemistry or in Scienze Chimiche consistent with the educational project				
ANNO DI CORSO NON DEFINITO Attività formative obbligatorie				
Erogazione	Attività formativa	Modulo/Unità didattica	Cfu	Settore
	English proficiency B2 (3 ECTS)		3	ND
Totale CFU obbligatori			3	
Altre attività a scelta				
TABLE 2 DISTINCTIVE COURSES				
Students must earn 24 CFU by selecting 4 of the following items; at least 1 of them (6 CFU) must belong to CHIM/02, CHIM/03 or CHIM/06 class.				
1 semestre	Catalytic Methodologies in organic synthesis <i>Course subscribed by Master in Scienze Chimiche</i>		6	CHIM/06
1 semestre	Concepts and methods in organic synthesis		6	CHIM/06
1 semestre	Design and optimisation of chemical plants		6	ING-IND/25

1 semestre	Environmental electrochemistry		6	CHIM/02
1 semestre	Industrial processes and scale-up		6	CHIM/04
1 semestre	Nanotechnology of inorganic materials		6	CHIM/03
1 semestre	Photochemical Processes and Photocatalysis <i>Course mutated by Master in Scienze Chimiche</i>		6	CHIM/02
1 semestre	Physical chemistry of formulations		6	CHIM/02
1 semestre	Recycle and Life Cycle Assessment (LCA) of products and processes		6	CHIM/04
2 semestre	Advanced Chemistry and Physics of Polymers		6	CHIM/04
2 semestre	Environmental control and sustainability management		6	CHIM/12
2 semestre	Heterogeneous catalysis		6	CHIM/02
2 semestre	Metal Science and Corrosion		6	CHIM/02
2 semestre	Polymer degradation and stability		6	CHIM/04
2 semestre	Process development		6	CHIM/04
2 semestre	Synthetic methods in biotechnology		6	CHIM/06

INTEGRATIVE AND RELATED COURSES

Student must earn 12 CFU by selecting 2 of the following items following teachings related and integrative.

1 semestre	Patents and Management of Innovation <i>Course subscribed by Master in Scienze Chimiche</i>		6	SECS-P/07
2 semestre	Chemical Safety		6	IUS/07
2 semestre	Medicinal chemistry <i>Course subscribed by Master in Scienze Chimiche</i>		6	CHIM/08

Attività conclusive

	Thesis work and Final dissertation		39	NA
		Totale CFU obbligatori	39	