DESCRIPTION OF THE CURRICULUM

(TEACHING REGULATIONS OF THE COURSE)

MASTER'S DEGREE COURSE IN CHEMISTRY

(LM-54R)

academic year 2025/26

Outline

Art. 1 - General characteristics and organization

The Master's Degree Course in Chemistry, class LM-54R – Chemical Sciences – is activated according to the educational regulations of the academic year 2025/2026.

The course in brief

Chemistry is a constantly evolving basic science, with implications for every aspect of the human life, the environment, nature and the technological development of society.

Chemical research focuses on the design, development and study of innovative processes and materials in several fields concerning both basic research and industrial applications.

In a society that values not only technological development but also health and eco-sustainability, Chemistry plays a fundamental role in optimizing low-impact industrial processes (green chemistry), recycling processes (circular economy) and the search for renewable energy sources.

The structure responsible for the course is the Department of Science and High Technology. The Program Coordinator is Prof. Massimo Mella.

The Didactic Secretariat receives by appointment in via Valleggio 11 (4th floor) and replies to emails through INFOSTUDENTI. More information about this can be found at the following link: https://www.uninsubria.it/servizi/tutti-i-servizi/infostudenti-servizio-informazioni-gli-studenti

Art. 2 - Teaching calendar of the course

Educational activities take place in Como. The internet address of the course is the following: https://www.uninsubria.it/formazione/offerta-formativa/corsi-di-laurea/chimica

The lesson calendar is published under the page **LESSON TIMETABLE:** https://www.uninsubria.it/formazione/offerta-formativa/corsi-di-laurea/chimica

The teaching calendar is divided into semesters:

I semester from **22 September 2025 to 16 January 2025**

II semester from **16 February 2026 to 12 June 2026**

Exams

There are at least 6 sessions for each course during the period of lessons suspension. The calendar of the exams is published on the page https://uninsubria.esse3.cineca.it/ListaAppelliOfferta.do

Art. 3 - Education goals, expected learning outcomes and career opportunities

The Master's Degree in Chemistry provides advanced theoretical, methodological, and applied knowledge and skills specific to chemical disciplines that allow the graduates to pursue scientific and professional careers in several sectors of the chemical industry or related to chemical sciences and technologies, or in research,

synthesis, analysis, formulation, and quality control laboratories in public and private institutions.

The Master's Degree in Chemistry program gives equal importance to the four core areas of Chemistry—Analytical Chemistry, Physical Chemistry, Inorganic Chemistry, and Organic Chemistry. A course in Industrial Chemistry is also offered.

INORGANIC CHEMISTRY AREA

Knowledge and understanding

- In-depth knowledge and understanding of the properties of coordination compounds, with particular emphasis on metal/ligand interactions and the resulting spectroscopic characteristics. Knowledge and understanding of the main categories of ligands characteristic of coordination chemistry. Knowledge and understanding of the basic reactions involving the metal center of a coordination compound. Basic knowledge and understanding of homogeneous catalysis.
- Knowledge and understanding of the formation and reactivity of different types of metal-carbon bonds in the most common organometallic compounds of the main groups and d transition metals. Knowledge and understanding of the synthetic methodologies that lead to the formation of C-X (X = C, N, O, S, P) bonds.
- Knowledge and understanding of the methodological and structural aspects of ionic and molecular solids. Knowledge and understanding of diffraction (optical and X-ray) physics and the foundations of modern crystallographic techniques. Knowledge and understanding of typical approaches to structural analysis.
- In-depth knowledge and understanding of homogeneous catalysis, with particular reference to the features of the main catalytic processes that can be implemented in the laboratory or in industry.
- Basic knowledge of the nature and properties of the main metallo-enzymes, with particular attention to the function and structure of their active site and their role in biological structures.

Ability to apply knowledge and understanding

- Ability to solve problems in coordination chemistry (predicting molecular geometry, electronic structure, bond type, or reactivity of a species). Ability to understand basic scientific literature in coordination and organometallic chemistry.
- Ability to design the formation and predict the reactivity of different types of metal-carbon bonds in the most common organometallic compounds containing main group or d-transition metals.
- Ability to understand and critically evaluate structural models found in literature for their use in chemical-physical, analytical, or reactivity prediction.
- Ability to perform the synthesis and characterization of some organometallic catalysts, as well as to use them in hydrogenation and/or carbon-carbon coupling reactions.
- Ability to define the role of metals (mainly transition metals) in the organization and functioning of living systems.

PHYSICAL CHEMISTRY AREA

Knowledge and understanding

- Knowledge and understanding of computational and experimental chemical-physical methods to study the properties and action mechanisms of molecules, supramolecular systems, condensed-phase systems, interfaces, and reduced-dimensional systems.
- Advanced knowledge and understanding of spectroscopy techniques and their applications.
- Advanced knowledge and understanding of the relationships between electronic structure, supramolecular organization, and macroscopic properties.
- Knowledge and understanding of chemical information transfer mechanisms.
- Knowledge and understanding of the main manufacturing and characterization techniques and applications of materials for advanced technologies.

Ability to apply knowledge and understanding

- Ability to apply the most modern chemical-physical methods, both theoretical and experimental, to chemical problems from a multidisciplinary perspective.
- Ability to plan and perform a (model or experimental) research project in the chemical-physical field.

ORGANIC CHEMISTRY AND BIOCHEMISTRY AREA

Knowledge and understanding

- In-depth knowledge and understanding of the reactivity, structural properties, and synthetic methodologies of heterocyclic compounds with simple and condensed rings, including those of potential interest in the pharmaceutical field and as innovative materials.
- Knowledge and understanding of the influence of molecular shape and the spatial arrangement of atoms on their physical and biological properties. Knowledge and understanding of the engineering challenges of constructing molecules with dynamic properties related to the presence of mechanical bonds. Knowledge and understanding of the rules imposed by the electronic structure of reactive molecules in transformations of theoretical and applicative relevance.
- Knowledge and understanding of topics involving particularly innovative aspects of organic synthesis that have been recently published in the scientific literature, with particular reference to novel transformations of functional groups.
- Knowledge and understanding of the most innovative methodologies in organic synthesis for the formation of carbon-carbon and carbon-heteroatom bonds for the preparation of products with greater molecular complexity, with a fundamental role as biologically and pharmacologically active derivatives, or containing a different number of stereocenters.
- Knowledge and understanding of the principles of drug discovery and mechanisms of action of drugs, as well as the synthetic methodologies of selected classes of drugs.

- Knowledge and understanding of the relationships between molecular and/or crystalline structure and macroscopic properties of biological macromolecules, their complexes, and complexes between macromolecules and small molecules of physiological and pharmaceutical interest. Knowledge and understanding of the separation, preparative, and analytical techniques used in the study of biological systems. Knowledge and understanding of the most common molecular biology techniques for engineering cellular systems.

Ability to apply knowledge and understanding

- Ability to develop synthetic strategies for the synthesis of heterocyclic systems, with particular attention to the involved intermediates. Ability to identify the most cost-effective procedures for the synthesis of heterocycles in the context of total syntheses or complex synthetic sequences.
- Ability to predict the properties, reactivity, and obedience to external stimuli of simple and complex organic molecules.
- Ability to solve organic synthesis problems using the approaches and reasoning typical of a synthetic organic chemist.
- Ability to design advanced organic synthesis for the formation of carbon-carbon and carbon-heteroatom bonds to prepare products with greater molecular complexity, high added value, or containing a different number of stereocenters.
- Ability to apply the principles of drug discovery and drug mechanism of action, as well as to propose synthetic methodologies for selected drug classes.
- Ability to apply the separation, preparative, and analytical techniques used in the study of biological systems.
- Ability to apply the most common molecular biology techniques to engineer cellular systems.

INDUSTRIAL CHEMISTRY AREA

Knowledge and understanding

Basic knowledge and understanding of industrial chemistry, with particular reference to the industrialization of chemical reactions and the fundamental aspects of process scale-up.

Ability to apply knowledge and understanding

Ability to evaluate the possibilities of developing a reaction also from a engineering point of view.

ANALYTICAL CHEMISTRY AREA

Knowledge and understanding

- Knowledge and understanding of the main statistical techniques for univariate and multivariate analysis of chemical data: data collection and preparation; univariate and multivariate exploratory analysis; projection methods; clustering techniques; classification techniques; regression methods;

fundamentals of spectroscopic data processing; and an introduction to experimental design.

- Knowledge and understanding of advanced materials analysis techniques: XRF, Raman and Mössbauer spectroscopies; surface analysis techniques (XPS, SEM, TEM); thermal analysis techniques (TGA, DSC, DTA).
- Knowledge and understanding of the thermodynamic and kinetic fundamentals of electrochemistry and electrode reactivity. Knowledge and understanding of the principles, types, and applications of voltammetric techniques. Knowledge and understanding of the principles and applications of potentiometric techniques. Knowledge and understanding of the theoretical aspects and practical uses of sensors and biosensors, as well as the materials used for their manufacturing.
- Knowledge and understanding of the various analytical strategies and techniques used for process control. Basic knowledge and understanding of communication protocols and automated management of process variables.
- Knowledge and understanding of cultural heritage degradation phenomena, with particular reference to the analytical investigation techniques appropriate for their detection.

Ability to apply knowledge and understanding

- Ability to use multivariate analysis techniques in the following contexts: experimental design, exploratory data analysis, predictive modeling, and process data management.
- Ability to plan and approach materials analysis from the standpoint of characterization and chemical composition using a multidisciplinary approach.
- Ability to identify and employ the appropriate voltammetric technique for the characterization or quantification of a chemical species. Ability to understand the role, advantages, and limitations of electrochemical techniques within the general panorama of analytical techniques.
- Ability to interpret multiparametric data and the resulting responses in the context of chemical process control.
- Ability to identify the best techniques for investigating cultural heritage sites to identify the materials and methodologies used for their manufacturing, as well as to highlight the nature of any degradation phenomena that may be present.

JOB OPPORTUNITIES

Master's degree graduates in Chemistry, upon passing the state exam, may enter Section A - Chemistry of the professional register of the National Federation of Orders of Chemists and Physicists.

They will find employment in public or private institutions, or in industries in the chemical or related sectors. They will be able to work in basic and applied research, synthesis, analysis, formulation, and quality control laboratories, as well as in production, sales, and product management departments, including in monitoring, management, and direction roles. Finally, master's degree graduates will be prepared to continue their studies at a tertiary level.

Art. 4 - Admission to the course

For the 2025/2026 academic year, enrollment in the Master's Degree in Chemistry is open.

Initial preparation verification

The admission to the Master's Degree in Chemistry is subject to the verification of the student's curricular requirements and the adequacy of his/her personal preparation.

Candidates who meet the following curricular requirements may be admitted to the Master's Degree in Chemistry:

- a degree in the Chemical Sciences and Technologies Class (L-27) or the corresponding Class 21 ;
- a degree in another class obtained from a national university, or a qualification obtained abroad, provided that it is deemed suitable by the Degree Programme Board.

The possession of the curricular requirements is verified by a committee composed of at least four professors from the degree program in the areas of Analytical Chemistry, Physical Chemistry, Inorganic Chemistry, and Organic Chemistry. The exams taken by the candidate will be considered in the evaluation, with particular attention to those included in the core and characterizing scientific-disciplinary sectors for the L-27 class. More specifically, the following requirements have to be satisfied:

- at least 12 University Educational Credits (CFU) in mathematics and physics;
- at least 80 CFU in the core and characterizing scientific-disciplinary sectors of the L-27 Class.

Upon meeting the curricular requirements, the Commission also assesses the personal preparation of the students interested in enrolling in the Master's Degree Program with a dedicated interview. The ability to understand a scientific university text written in English is also assessed.

If, during the interview, the need for additional training in specific areas emerges, such training will be quantified in credits, which must be acquired before the admission to the program itself by enrolling in individual courses of the Bachelor's Degree Program in Chemistry and Industrial Chemistry. After completing these additional training, the Commission will decide on the admission to the Master's Degree.

Art. 5 - Education Path

The program for the Master's Degree in Chemistry does not include curricula.

12 university credits (CFU) are attributed to the characterizing disciplines in the chemical field (TAF-B, mandatory) for each of the four fundamental areas of Chemistry - Analytical Chemistry, Physical Chemistry, Inorganic Chemistry, and Organic Chemistry - for a total of 48 CFU. In addition, 10 CFU are attributed to the Industrial Chemistry course (TAF-B).

16 credits are attributed to related/complementary courses (TAF-C). Additional 8 credits are dedicated to elective courses (TAF-D). Courses from other degree programs may also be selected as elective courses, provided they are consistent with the goals of the Master's Degree in Chemistry and have a different title than those of the Master's Degree in Chemistry. Furthermore, 2 credits are available for additional training activities/transversal skills (TAF-F), such as the participation in thematic courses and seminars proposed by the Degree Program Council.

The study program ends with a thesis (33 credits), during which students undertake original research on a specific topic. This research can be completed either in a university research laboratory or outside the University in a company with which an appropriate agreement has to be signed. The thesis work is presented in the final exam (3 credits) before the Degree Commission, who evaluates its content and methodology.

The teaching for the Master's Degree in Chemistry is performed in a conventional way through lectures and classroom exercises, as well as teaching laboratories.

Lectures: This is the main and fundamental teaching activity; students attend lectures and independently process the content they have listened to.

Exercises: This activity allows to understand completely the content of lectures through the development of applications. No additional content is added to the lectures. Typically, exercises are associated with lectures and do not exist independently. In "passive" exercises, the application development is performed by the instructor; in active exercises, students develop applications under the instructor's supervision.

Laboratory: This is a supervised activity that involves the student interaction with tools, equipment, or application software packages.

Attendance is required for at least 75% of the exercises and laboratory sessions included in the courses.

CFU/hours correspondance for each type of activity

University Educational Credits (CFU) are a measurement of the amount of learning, including individual study, required to a student with an adequate initial preparation to acquire knowledge and skills in the educational activities required by the degree program.

Any educational activity (teaching, laboratory, internship, thesis, etc.) within the degree program corresponds to a specific number of educational credits (CFU).

Each CFU corresponds to 25 hours of commitment, given by the hours of lectures and laboratory and the ones of independent study necessary to complete the student's preparation.

The CFU number corresponding to each educational activity is acquired by the student upon passing the exam or any other form of assessment defined in the degree program rules.

Educational Activities / CFU:

- 8 hours of lectures with 17 hours of individual study
- 12 hours of practical exercises with 13 hours of individual study
- 12 hours of laboratory work with 13 hours of individual study
- seminars: 10 hours/CFU
- internship: 25 hours/CFU.

Assessment Methods for Educational Activities

Assessment methods for individual courses may be based on written, oral, and/or practical exams (with a report) depending on the specific characteristics of the course. To take the exams, students must be enrolled in the Master's Degree Program as per the University Regulations. If the course specifically provides credits

for exercises or laboratory work, the participation to the exam is subject to the verification of the minimum attendance indicated in the regulations. Further details regarding the specific assessment and evaluation methods for individual courses are specified in the course syllabi.

Possible Prerequisites and/or Exclusions

There are no prerequisites.

Art. 6 - Rules for submitting study plans

Students must submit their Study Plan in their first year, with the possibility of modifying it in the following years, according to the deadlines set annually and reported on the Student Administration web pages: https://www.uninsubria.it/servizi/presentazione-piano-di-studio

Students complete their study plan online by accessing their ESSE3 reserved area, and must indicate:

- the courses that have to be chosen from dedicated lists
- the related/complementary courses (TAF C), which are worth 12 credits;
- the elective courses (TAF D), which are worth 8 credits.

To help in the selection, the Degree Program Council lists in the online procedure some recommended courses (TAF D) that are consistent with the curriculum.

The study plan may be submitted in paper format only in special cases, to be agreed upon with the Student Secretariat.

Student Elective Courses (letter D)

Students may choose, starting in their first year, from courses offered in the Chemistry program if they have not already chosen them, or from other programs offered by the Department or the University, provided they are consistent with their curriculum and subject to approval by the Degree Program Council or the Department Council. In this case, the study plan must be submitted in paper format by requesting the form from the Student Secretariat via INFOSTUDENTI.

Courses offered by limited access University degree programs cannot be chosen.

Further language skills, IT and interpersonal skills, internships and other (letter F)

Students may choose, subject to approval by the Degree Program Council or Department Council, starting in their first year, from:

- courses offered in the Chemistry program, if not already chosen, or from other programs offered by the Department or the University;
- internships;
- participation in seminars as part of the programs offered by the Department of Science and High Technology;
- participation in courses: Summer School, Winter School, and/or other courses organized by the University of Insubria;

- activities organized by the Department and advertised annually in the Study Manifesto.

Art. 7 - Opportunities offered during the training path

The program promotes several initiatives that complement and enrich the academic experience. In particular, it is possible to participate in mobility and internationalization programs:

- **Mobility abroad – Erasmus and other opportunities**
  https://www.uninsubria.it/internazionale/mobilita-allestero/programma-erasmus
- **Erasmus with an Italian university:** Two agreements are about to be activated for the 2025/26 academic year with the University of Perugia and the University of Padova. Further information will be available on the Master's Degree program website.
- **Tutoring service** (https://www.uninsubria.it/servizi/tutti-i-servizi/tutorato)
  The program annually identifies discipline tutors, i.e., teachers that can be contacted by students on topics regarding international mobility, the compilation of the study plan, career guidance etc.

Contacting the "Diritto allo Studio" office, it is possible to apply for student collaborations: https://www.uninsubria.it/servizi/tutti-i-servizi/collaborazioni-studentesche-200-ore

The Degree Program, in collaboration with the University offices, supports students in organizing internships. Curricular internships are included in the study plans and take place during the course, also to complete the degree thesis. They are designed to enhance the student's learning and development process by creating opportunities for alternating study and work. Their duration is governed by university regulations, in compliance with the applicable national legislation.

The Didactic Secretariat takes care of all the administrative procedures, including the stipulation of individual agreements with companies/public bodies and training project.

Curricular internships provide the recognition of educational credits, which are required for the degree; for this reason, each internship offer will be evaluated by the relevant academic body based on the following aspects: consistency with the student's educational path, validity of the proposal, consistency of duration (number of months and number of hours) with the number of credits required for curricular internships in the specific program.

Art. 8 - Graduation

Master's students in Chemistry are eligible for the final exam after passing all the exams, completing their master's thesis, and submitting a final dissertation describing the work and the achieved results. The final exam consists of a defense of the key findings obtained during the master's thesis before a committee, who assigns a degree grade. This grade takes into account both the candidate's overall curriculum (defined as the weighted average of the exam grades, expressed out of 110), the validity of the thesis work, the final presentation. The committee may increase the grades weighted average of up to 8 points (up to 4 proposed by the Supervisor and up to 4 proposed by the Committee).

To get the 33 credits for the thesis, students must complete an original experimental work lasting at least eight months of continuous activity on a topic consistent with their academic program. The work is performed under the supervision of a University faculty member (Supervisor) belonging to the Scientific-Disciplinary Sectors CHIM/#, BIO/10, BIO/11, or BIO/12. The work may be performed at the Supervisor's research laboratory or at an external public or private organization, subject to an agreement between the organization and the University. To begin the experimental work, students submit a preliminary request for approval to the Degree Program Council, who evaluates the application at the first available meeting. At the end of the thesis period, the candidate must produce an original paper describing the experimental work. The thesis must include a description of the current state of the art of the topic, the goal of the work, the experimental approach, the used methodologies and materials, the obtained results, their critical discussion, and the drawn conclusions. Upon request, the thesis may be written in English.

To get the 3 credits for the Final Exam, the thesis is presented and discussed publicly during one of the graduation sessions scheduled in the academic calendar, before an Admissions Committee composed of at least five professors from the Chemistry and Industrial Chemistry Degree Program Council. The candidate is admitted to the graduation session upon obtaining all the credits required in the Individual Study Plan (with the exception of those for the Final Exam). Following the presentation, the Committee may ask the candidate questions regarding the work.

Upon graduation, a **Diploma Supplement** is issued. The Diploma Supplement is an informative report accompanying the official qualification awarded at the end of the study program. It describes the nature, level, context, content, and status of the studies undertaken and completed by the student. It is issued in both Italian and English. The purpose of the document is to provide independent data for the international transparency of qualifications (diplomas, degrees, certificates, etc.) and to enable equitable academic and professional recognition, promoting student mobility. The Diploma Supplement complies with the Europass standard.

Appendix 1 – Study plan

FUNDAMENTAL COURSES								
YEAR	**SEM**	**Name**	**Sector**	**Sector 2025**	**Disciplinary area**	**CFU**	**Hours**	**VERIFICATION METHOD***
1	II	INDUSTRIAL CHEMISTRY	CHIM/04	CHEM-04/A	B / INDUSTRIAL CHEMICAL DISCIPLINES	10	LEZ: 64 LAB: 24	V
1	I o II	ELECTIVE COURSES (as shown in tab. A)			B / INDUSTRIAL CHEMICAL DISCIPLINES	48		V
2	I o II	ELECTIVE COURSES (as shown in tab. B)			C	16		V
2	I o II	ELECTIVE COURSE	NN	NN	D / ELECTIVE	8		V
2		FURTHER KNOWLEDGE	NN	NN	F / OTHER KNOWLEDGE FOR ENTERING THE JOB MARKET	2		
2		THESIS	NN	NN	F / INTERNSHIP	33		
2		FINAL EXAM	NN	NN	E / FINAL EXAM	3		

I = first semester; II = second semester

1 CFU of lecture (LEZ) = 8 hours; 1 CFU of exercises (ESE) or laboratory (LAB) = 12 hours

G – Judgement V – Exam I – Suitability F – Attendance

TABLE A

The student has to choose two courses B type for each of the following disciplinary sectors (SSD): CHIM/01 (CHEM-01/A), CHIM/02 (CHEM-02/A), CHIM/03 (CHEM-03/A) and CHIM/06 (CHEM-05/A) for a total of 48 credits.

YEAR	**SEM**	**Name**	**Sector**	**Sector 2025**	**Disciplinary area**	**CFU**	**Hours**	**VERIFICATION METHOD***
1	I	ANALYTICAL CHEMISTRY OF MATERIALS	CHIM/01	CHEM-01/A	B / ANALYTICAL AND ENVIRONMENTAL CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	II	CHEMIOMETRICS	CHIM/01	CHEM-01/A	B / ANALYTICAL AND ENVIRONMENTAL CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	ELECTROANALYSIS	CHIM/01	CHEM-01/A	B / ANALYTICAL AND ENVIRONMENTAL CHEMICAL DISCIPLINES	6	LEZ 48	V

1	II	COMPUTATIONAL PHYSICAL CHEMISTRY	CHIM/02	CHEM-02/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 32 LAB: 24	V
1	II	NANOMATERIALS	CHIM/02	CHEM-02/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 32 LAB: 24	V
1	II	APPLIED PHYSICAL CHEMISTRY: FROM MOLECULES TO DEVICES	CHIM/02	CHEM-02/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	HIGHER INORGANIC CHEMISTRY	CHIM/03	CHEM-03/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	II	ORGANOMETALLIC CHEMISTRY	CHIM/03	CHEM-03/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	CHEMICAL STRUCTURES	CHIM/03	CHEM-03/A	B / CHEMICAL, INORGANIC AND PHYSICAL-CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	HIGHER ORGANIC CHEMISTRY	CHIM/06	CHEM-05/A	B / ORGANIC CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	CHEMISTRY OF HETEROCYCLIC COMPOUNDS	CHIM/06	CHEM-05/A	B / ORGANIC CHEMICAL DISCIPLINES	6	LEZ: 48	V
1	I	PRINCIPLES OF ORGANIC SYNTHESIS	CHIM/06	CHEM-05/A	B / ORGANIC CHEMICAL DISCIPLINES	6	LEZ: 48	V

I = first semester; II = second semester

1 CFU of lecture (LEZ) = 8 hours; 1 CFU of exercises (ESE) or laboratory (LAB) = 12 hours

G – Judgement V – Exam I – Suitability F – Attendance

TABLE B

The student has to choose two courses for a total of 16 credits.

YEAR									
YEAR	**SEM**	**Name**	**Module**	**Sector**	**Sector 2025**	**Disciplinary area**	**CFU**	**Hours**	**VERIFICATION METHOD***
2	I	ANALYTICAL CHEMISTRY FOR ENVIRONMENTAL AND INDUSTRIAL MONITORING	ANALYTICAL CHEMISTRY FOR ENVIRONMENTAL AND INDUSTRIAL MONITORING (MOD. A)	CHIM/01	CHEM-01/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			ANALYTICAL CHEMISTRY FOR ENVIRONMENTAL AND INDUSTRIAL MONITORING (MOD. B)	CHIM/01	CHEM-01/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
2	I	ANALYTICAL CHEMISTRY OF CULTURAL HERITAGE	ANALYTICAL CHEMISTRY OF CULTURAL HERITAGE (MOD. A)	CHIM/01	CHEM-01/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			ANALYTICAL CHEMISTRY OF CULTURAL HERITAGE (MODULO B)	CHIM/01	CHEM-01/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
2	II	THEORETICAL CHEMISTRY	THEORETICAL CHEMISTRY (MOD. A)	CHIM/02	CHEM-02/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			THEORETICAL CHEMISTRY (MOD. B)	CHIM/02	CHEM-02/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
2	II	HOMOGENEOUS CATALYSIS		CHIM/03	CHEM-03/A	C/RELATED OR COMPLEMENTARY	8	LEZ: 40 LAB: 36	V
2	I	BIOINORGANIC CHEMISTRY	BIOINORGANIC CHEMISTRY (MOD. A)	CHIM/03	CHEM-03/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			BIOINORGANIC CHEMISTRY (MOD. B)	CHIM/03	CHEM-03/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
2	I	ADVANCED SYNTHESIS IN ORGANIC CHEMISTRY	ADVANCED SYNTHESIS IN ORGANIC CHEMISTRY (MOD. A)	CHIM/06	CHEM-05/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			ADVANCED SYNTHESIS IN ORGANIC CHEMISTRY (MOD. B)	CHIM/06	CHEM-05/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V

2	I	SYNTHESIS AND PROPERTIES OF BIOLOGICALLY ACTIVE SUBSTANCES	SYNTHESIS AND PROPERTIES OF BIOLOGICALLY ACTIVE SUBSTANCES (MOD. A)	CHIM/06	CHEM-05/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
			SYNTHESIS AND PROPERTIES OF BIOLOGICALLY ACTIVE SUBSTANCES (MOD. B)	CHIM/06	CHEM-05/A	C/RELATED OR COMPLEMENTARY	4	LEZ: 32	V
2	I	ADVANCED BIOCHEMISTRY AND BIOCHEMICAL METHODOLOGIES		BIO/10	BIOS-07/A	C/RELATED OR COMPLEMENTARY	8	LEZ: 64	V

I = first semester; II = second semester

1 CFU of lecture (LEZ) = 8 hours; 1 CFU of exercises (ESE) or laboratory (LAB) = 12 hours

G – Judgement V – Exam I – Suitability F – Attendance