

Master in Chemistry

(Laurea Magistrale in Chimica)

The Master in Chemistry (*Laurea Magistrale in Chimica*) is a two-year second level university course designed to train graduates possessing a thorough knowledge and culture in the various fields of chemistry, as well as a strong scientific and operational preparation in both basic and applied chemistry.

The course provides a range of four curricula (Analytical Chemistry, Materials Chemistry, Organic Chemistry, Supramolecular and Bioinorganic Chemistry), each allowing the students to achieve an extensive knowledge of advanced methods and techniques in all sectors of chemistry, e.g. synthesis of fine chemicals, molecular level devices and machines, new materials, chemiometrics.

Lectures are in Italian; however, most reference and study material for the preparation of exams is in English and is available from the Science Library, Chemistry Section.

Graduates in Chemistry are qualified to carry out activities to promote scientific and technological innovation and development, management and planning of technology and, in general, qualified professional activities in areas related to chemical disciplines.

According to their personal training, graduates in Chemistry will be qualified for enrolment in Ph.D. programs in Chemistry as well as in other disciplines such as Biochemistry, Biotechnology, Pharmaceutical or Materials Science.

Professional and career opportunities

Activities

Graduates in Chemistry carry out the following activities:

- Basic and applied chemical research or activities requiring procedures and protocols of Chemistry;
- Development and certification of new methods for chemical, environment and certification analyses;
- Scientific and technological research in public or private Universities and research organizations, with a possible outcome in academic career.

Tasks

The tasks performed by graduates in Chemistry include:

- Supervision of basic and applied research laboratories in public or private structures;
- Development of new products and production processes in companies operating in the chemical, pharmaceutical, cosmetic, veterinary, food, and materials industries;
- Head of Production and Quality Inspections at the companies mentioned above;
- Advice and opinion in matters of Pure and Applied Chemistry;

Career opportunities

Graduates in Chemistry can have a career in:

- Public and private research bodies;
- Laboratories for analysis, quality control and certification;
- Public and / or private companies and institutions, as an employee or a freelance consultant;
- Industries and work environments that require advanced knowledge in the areas of chemistry;
- University Teaching.

General outline of the Course

The training plan provides a range of four curricula: (i) Analytical Chemistry, (ii) Materials Chemistry, (iii) Organic Chemistry, (iv) Supramolecular and Bioinorganic Chemistry. For each path, training activities (120 credits) are distributed over the two years according to the following scheme:

1 st year	credits	2 nd year	credits
1 <i>Main Characterizing</i> course	6	2 <i>Integrative</i> courses (6 credits each)	12
2 <i>Laboratory</i> courses (9 credits each)	18	1 <i>Free</i> course	6
5 <i>Characterizing</i> courses (6 credits each)	30	Foreign language and computer skills	3
1 <i>Free</i> course	6	Experimental thesis internship	39

Notes The choice of the *Main Characterizing* course determines the choice of the curriculum; The *Laboratory* and *Characterizing* courses of each curriculum are linked to the *Main Characterizing* course according to the schemes reported below; The *Characterizing* courses of each path are chosen from the chart in the following page; The *Free* courses of both 1st and 2nd year can be chosen among the courses listed in the following page, provided they have not been chosen as *Characterizing* or *Integrative* courses, or from the teaching offer of the University.

FIRST YEAR

Curriculum *Analytical Chemistry*

- ▶ **Main courses**
Analytical Chemistry III (I sem.)
Laboratory of Analytical Chemistry III (I sem.)
Laboratory of Physical Chemistry III (II sem.)
 or
Laboratory of Inorganic Chemistry III (II sem.)
- ▶ **Characterizing courses:**
 Two courses of area CHIM/01
 (Analytical Chemistry)
 One course of area CHIM/02
 (Physical Chemistry)
 One course of area CHIM/03
 (General and Inorganic Chemistry)
 One course of area CHIM/06
 (Organic Chemistry)
- ▶ *One free course*

Curriculum *Materials Chemistry*

- ▶ **Main courses**
Physical Chemistry III (II sem.)
Laboratory of Physical Chemistry III (II sem.)
Laboratory of Analytical Chemistry III (I sem.)
- ▶ **Characterizing courses:**
 Two courses of area CHIM/02
 (Physical Chemistry)
 Two courses of area CHIM/03
 (General and Inorganic Chemistry)
 One course of area CHIM/06
 (Organic Chemistry)
- ▶ *One free course*

Curriculum *Organic Chemistry*

- ▶ **Main courses**
Organic Chemistry III (I sem.)
Laboratory of Organic Chemistry III (I sem.)
Laboratory of Inorganic Chemistry III (II sem.)
 or
Laboratory of Physical Chemistry III (II sem.)
- ▶ **Characterizing courses:**
 Two courses of area CHIM/06
 (Organic Chemistry)
 One course of area CHIM/01
 (Analytical Chemistry)
 One course of area CHIM/02
 (Physical Chemistry)
 One course of area CHIM/03
 (General and Inorganic Chemistry)
- ▶ *One free course*

Curriculum *Supramolecular and Bioinorganic Chemistry*

- ▶ **Main courses**
Inorganic Chemistry III (II sem.)
Laboratory of Inorganic Chemistry III (II sem.)
Laboratory of Organic Chemistry III (I sem.)
- ▶ **Characterizing courses:**
 Two courses of area CHIM/03
 (General and Inorganic Chemistry)
 One course of area CHIM/01
 (Analytical Chemistry)
 Two courses of area CHIM/02
 (Physical Chemistry))
- ▶ *One free course*

Characterizing Courses (6 credits each)

Choose in the following chart the characterizing courses for your path, according to the scheme in the previous page.

1 st semester	2 nd semester
CHIM/01 (Analytical Chemistry) Analytical Chemistry III Environment Analytical Chemistry Electroanalytical Chemistry	Chemistry for Forensic Science Data Processing and Chemiometry
CHIM/02 (Physical Chemistry) Physical Chemistry of Metals and Ceramics Nanochemistry and Nanomaterials Solid State Spectroscopy	Physical Chemistry III Physical Chemistry of Solid State Devices Materials Characterization Techniques Modelling Techniques in Materials Chemistry
CHIM/03 (General and Inorganic Chemistry) Bioinorganic Chemistry Chemistry of Coordination Compounds	Inorganic Chemistry III Organometallic Chemistry Supramolecular Chemistry Inorganic Nanochemistry
CHIM/06 (Organic Chemistry) Organic Chemistry III Chemistry and Technology of Polymers Green Chemistry Computational Methods and Molecular Design in Bio-organic Chemistry	Chemistry of Heterocycles Advanced Organic Chemistry Chemistry of Natural Organic Compounds

SECOND YEAR (all curricula)

► *Two* Integrative Courses (6 credits each – choose in the following chart):

1 st semester	2 nd semester
Energy Harvesting and Conversion Pharmacology Advanced Biocatalysis Applied Nuclear Chemistry Physical Methods in Inorganic Chemistry Biochemical Methods Mineralogy Interpretative Spectroscopic Techniques	Materials Chemistry and Technology

- *One* free course (6 credits)
- Experimental Thesis Internship (39 credits)
- Foreign language and computer skills (3 credits)

Students are allowed to submit a Personal Study Schedule, in which the 120 credits required to obtain the degree are grouped in a different way from the curricula outlined above.

Starting from academic year 2016-17, students enrolled in the Master in Chemistry are entitled to participate in the *Lauree Magistrali Plus* project. This education project offers to a selected group of students a Study Schedule based on five semesters (instead of four), including two terms of professional training with firms and laboratories registered with the University. Information on the University's website: http://news.unipv.it/?page_id=10661

More information in the *Guida dello Studente* (Italian only) on: <http://www-3.unipv.it/scichim/>