



UNIVERSITÀ  
DI CAMERINO

## School of Science and Technology

### Master degree in **Chemistry and Advanced Chemical Methodologies**

(Class **LM - 54** )

## STUDENT GUIDE

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**Duration of course 2 years**

**Total acquired credits 120**

**Location:**

Town **Camerino**

Address **via S. Agostino 1**

**Academic Year 2010-2011**

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## **2. Introduction**

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The M.Sc. (LM) in “Chemistry and Advanced Chemical Methodologies” belongs to the class LM-54 (Chemical Sciences). Admission to LM course requires to be graduated in Chemistry or in relative disciplines. In order to obtain the M.Sc. Degree 120 ECTS must be acquired, that are subdivided into four semesters. After a common first semester the students can choose between the following two study plans, giving students the chance to identify the right one meeting their interest and abilities: (i) **Synthesis and Molecular Reactivity**, and (ii) **Chemical Methodologies of Control and Analysis**. Students can submit their own study plan showing the training targets for approval of the Council of Study Programme. **All the training activities are held in English language.**

A strong basic preparation and the knowledge on innovative and advanced fields of chemistry, which contents are in accord with the new demands of job's sectors and are the objective of research of teachers, will be assured to all student.

The University of Camerino is distinguished in the national panorama for the number and quality of agreements with foreign Institutes and Universities. Among them, there is now the possibility for postgraduate students to get a Double Degree in Chemistry by following the **Dual Master's Degree Programme** thanks to an agreement with the **Instituto Superior Tecnico (IST) of Lisbon**. The Programme, developed and organised jointly by the parties, leads to two recognised Master's degree certificates, one from the student's home institution and one from the host institution. The program requires that students spend at least two semesters at the host University. UNICAM and IST accept to transfer semester credits obtained by a student in the other institution to be taken into account towards the degree awarded by the home institution subject to their internal rules and regulations. Students are granted mobility scholarships yearly by UNICAM in order to stay at the foreign university for requested periods. For further information please contact the internationalisation coordinator or read the Dual Master Agreement between UNICAM and IST available at:

[http://www.unicam.it/international/double\\_degree.asp](http://www.unicam.it/international/double_degree.asp)

On the basis of the agreement with IST for the A.A. 2009/2010 two students from each institution will be selected and admitted to the programme based on their academic results, prerequisite requirements, motivation and language skills.

## **3. Formative objectives of the Course and modality of verification of their attainment ...**

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The master degree in Chemistry and Advanced Chemical Methodologies will prepare a professional able to work in labs, industries and public corporations at a manager level, in the following fields:

(i) innovation in the synthesis of old and new products in keeping with efficiency and environmental sustainability required by European laws nowadays in force; (ii) use of advanced technologies for the structural determination of new molecules; (iii) identification and use of suitable technologies for industrial analyses, quality of products and process control, in clinical, toxicological, forensic and environmental fields; (iv) use of computational techniques devoted to

structural and mechanistic problem solving, to statistical treatment of data and process optimization.

This master degree course is organized into two curricula that allow to acquire skills and professionalisms in the following fields:

- **Synthesis and molecular reactivity:** the MS graduated will be able to design and perform efficient and eco-friendly syntheses of organic, inorganic and organometallic molecules, among them also fine chemicals for pharmaceutical, agricultural, food, biotechnological fields and new functional materials. Particular attention will be focalized on catalysis, economic efficiency and sustainable technologies. Bioorganic and bioinorganic studies will provide the correct theoretical/mechanistic bases for the comprehension of the action mechanism of biologically active molecules, among them natural organic substances and products for agriculture, food, and health.

- **Chemical methodologies for control and analysis:** the MS graduated will be able to evaluate the proper technique to solve a practical problem occurring during scientific research, industrial and applied research, quality assurance in tertiary and industrial sectors, environmental, clinical, agro-food and forensic activities. The student will develop skills in most modern instrumental techniques and abilities in critical evaluation of quality parameters related to the

peculiar problem. Complex matrixes (industrial, alimentary, biological and environmental) will be treated with the more advanced techniques. The student will be able to use software for data base management and data elaboration. All the activities connected with experimental thesis will play a significant role since the student will be involved in an advanced research project developed with an increasing autonomy. The thesis will be focused on experimental lab activities in order to warrant an adequate formation into the scientific research, to develop skills in independent experimental work, in data acquisition and elaboration, in discussion and critical presentation of results and of international chemical literature.

#### ***4. Admissions rules and entry requirements (D.M. 270/04)***

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Admission to studies for the M.Sc. Degree in Chemistry and Advanced Chemical methodologies requires the general knowledge indicated in the DM 270/04, art 6, comma 2, derived from the attainment of a first level Degree or a three-years University Diploma, or any other appropriate certificate from foreign countries. The admission for students with national or international undergraduate degree is subject to verification, by the Council of Study Programme, of the curriculum. In detail a requisite for the admission is the Degree in Chemistry certificate or the attainment of not less than 20 ECTS in mathematics, informatics and physics and not less than 30 ECTS in chemical disciplines, mainly in the sectors CHIM/01, CHIM/02, CHIM/03, CHIM/06 and BIO/10, as better defined in the Didactical Regulation of the Master in Science Degree Course. All these requirements are applied to graduated from every University.

#### ***5. Job opportunities***

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Postgraduates in Chemistry and Advanced Chemical Methodologies of the University of Camerino will possess adequate knowledge and skills to easily find a job in chemical industries, manufacturing sector and analysis/control laboratories. The postgraduates will apply in research, management and control activities, validation of new analytical methods, handling and management of advanced scientific instruments, organization and management of productive

processes. They will also be able to plan and synthesize new molecules and new materials. The professional opportunities of postgraduates are summarized in the ISTAT list.

Postgraduates can also be enrolled in the Professional Order of Chemists - sez.A, after passing an entrance examination (DPR 328 of 05/06/2001, art. 37) to practice the profession of Chemist. The University of Camerino supplies the postgraduates with Diploma Supplement.

Employment prospects:

- University, public research structures, national agencies such as ARPA, Ministries, Civil Protection Agency;
- Industrial applied research centres, industrial production, certification societies, quality control;
- Scientific divulgation agencies.

Postgraduates can apply for teaching in secondary schools and universities - according to the rules provided for by the regulation in force - and are eligible to study for PhD courses or higher level specialization courses.

Statistical data indicate that 84% of the Master graduated found a job in one year from the graduation (Alma Laurea 2009).

## **6. *Teaching organization***

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The teaching organization of the degree course in Chemistry and Advanced Chemical Methodologies is mainly carried out on-line by the service "didattica d'ateneo" available at <https://didattica.unicam.it>

European Credit Transfer and Accumulation System (ECTS)

The acquisition of knowledge and skills by students are assessed by credits. The credits represent their learning work including individual studies and practise (also laboratory) necessary to get the postgraduate degree course in computer science. 60 credits represent the medium study workload carried out by a full-time student with suitable starting preparation for one academic year. Students have to get 120 credits to obtain the postgraduate degree in computer science. The ratio of time spent for tutored activities and time spent for individual studies within the programme of training activities should usually be about 1:3. One credit is equal to a 25-hour standard workload for each student. For example, one credit might be equal to 7 hours of lectures in classroom or 12 hours in laboratory.

How to assess training activities

All activities concerning ECTS must be assessed. The assessment is expressed by specific committees chaired by the staff in charge of training activities. Exams are carried out written and/or oral or with other procedures suitable for particular kinds of activities. Students may be tested during the courses to verify their profit. Participation to these tests is optional and the result does not jeopardize the admission to the final exam. Tests to verify students' profit are also available for courses divided into modules (at the end of each module). If not different indicated, training activities are assessed by a grade expressed in numbers between 18 and 30, possibly "cum laude". It is necessary to verify the course attendance and write a report on carried out

activities signed by the teacher/supervisor to attribute credits for placements or apprenticeships. These assessments can be expressed with only 2 grades: "idoneo" (suitable) or "non idoneo" (not suitable).

Lecture and exam calendar

The teaching activity is divided into 2 semesters according to the following calendar:

I Semester Teaching activity	5th October 2010	To	29th January 2011
II Semester Teaching activity	1st March 2011	To	11th June 2011

Between the semesters there is a short period of stop of didactical activities that the teacher can use to carry out partial checks. It is mandatory to attend particularly for laboratory activities.

At the beginning of the academic year the examination data of each teaching (at least 8 per year) will be communicated. There are 5 data per year for the final exam.

Information about timetables and rooms where lessons are taken are available at <http://www.unicam.it/studenti/OrariLezioni/>. Exam sessions are provided for every course at the end of each period. The teachers will have to inform students about the kind of exam for each course quite in advance; the exam will only be oral if not specified. Exams can include the carrying out of projects and seminars, suitable for promoting the grade of autonomy and independence in the student. The student who wants to take an exam is obliged to register on-line for the session of the specific course at <https://didattica.unicam.it> with username and password supplied when the student enrolls. The exam programme is the last teaching programme carried out for the same course. Therefore the programme carried out during the course will generally be valid for 12 months from the end of teaching activities. The calendar of exam sessions and teaching programmes are available at <https://didattica.unicam.it>

### Master degree curriculum:

<b>I Year</b>					
<b>I semester</b>					
Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Advanced Physical Chemistry	CHIM/02	6		b	Mark
Advanced Organic Chemistry	CHIM/06	6		b	Mark
Advanced Inorganic Chemistry	CHIM/03	6		b	Mark
Advanced Analytical Chemistry	CHIM/01	6		b	Mark
Physical Methods in Organic Chemistry	CHIM/06	6		b	Mark
<b>Curriculum Synthesis and Molecular Reactivity</b>					
<b>II semester</b>					
Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Industrial and Advanced Synthesis of Biologically Active Compounds	CHIM/06 ING-IND/27	3 6		b c	Mark

Organic Stereochemistry and Laboratory	CHIM/06	6		b	Mark
Organometallic Chemistry	CHIM/03	7		b	Mark
Physical Methods in Inorganic Chemistry	ING-IND/23	6		c	Mark

### Curriculum **Chemical Methodologies of Control and Analysis**

#### II semester

Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Instrumental Analytical Chemistry and Laboratory	CHIM/01	10		b	Mark
Chemometrics	CHIM/01	5		b	Mark
Environmental Chemistry and Laboratory	CHIM/12	12		6 c 6 b	Mark
Sample Preparation in Analytical Chemistry	CHIM/12	5		b	Mark

#### II year

### Curriculum **Synthesis and Molecular Reactivity**

#### I semester

Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Green Chemistry	CHIM/06 CHIM/03	3 4		b	Mark
Optional activity		8		d	

#### II semester

Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Inorganic Solid State Chemistry	CHIM/03	7		b	Mark
Chemistry Project thesis		10 30		f e	

#### II year

### Curriculum **Chemical Methodologies of Control and Analysis**

#### I semester

Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Technologies for Waste Management	CHIM/07	6		c	Mark
one of the following activities	Molecular Spectroscopy	CHIM/01	4		Mark
	Biomonitoring	BIO/07	4		Mark
	Environmental Legislation	IUS/07	4		Mark
	Chemistry of Pollutants	CHIM/12	4		Mark

#### II semester

Corse name	SSD	ECTS	Module of the course*	Type of activity *	Mark or idoneity
Chemistry Project thesis		10 30			
Optional activity		8			
<b>Total ECTS*</b>		<b>120</b>			

#### OPTIONAL ACTIVITIES

### Curriculum **Chemical Methodologies of Control and Analysis**

Corse name	SSD	ECTS	Type of activity *
Crystallography	GEO/06	4	d
Electrochemistry	CHIM/01	4	d
Radiochemistry	CHIM/03	4	d

#### Curriculum **Synthesis and Molecular Reactivity**

Corse name	SSD	ECTS	Type of activity *
Inorganic and Organometallic Biochemistry	CHIM/03	4	d
Supramolecular Chemistry	CHIM/03	4	d
Crystallography	GEO/06	4	d
Radiochemistry	CHIM/03	4	d
Environmental Chemistry	CHIM/12	6	d
Chemometrics	CHIM/01	5	d

#### Typology

- a introductory course
- b core course
- c supplementary course
- d elective course
- e for the final exam and for knowledge of a foreign language
- f other (additional language skills, computer skills, internship/work experience stage etc.)
- g local specific activities

## **7. Teaching activities and teachers**

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Attachment A of this handbook contains in detail any information about active courses and relative teachers offered by School of Science and Technology and Degree Course for the following sets of students

- Freshmen starting **in 2010 and attend the 1<sup>st</sup> year**
- Students who started in 2009 and **attend the 2<sup>nd</sup> year**

## **8. Curricula for teachers, programs of individual learning activities, educational facilities**

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The programs of individual learning activities with their descriptions are made available by teachers on the University website, under the section 'Courses'.

Through this "gateway" it is possible to access the course lecturers' CVs and a description of the educational and scientific facilities available.

## **9. Teaching support services**

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### **• Post-graduate orientation**

There is often a disconnect between the learning program at a university and the reality of the workplace into which the student needs to enter. The orientation service provides guidance both to those graduating and to postgraduates, in collaboration with the Internship and Placement Service, as well as room for reflection on the choices of support activities for vocational training. The initiative "Young People + University = Work" is of particular relevance here. This takes place each year, generally in the autumn. University students and new graduates are invited to attend the event to have an opportunity to listen to the accounts given by many different

professionals, to meet and to establish direct contacts with company representatives, and to get to know experts from the world of work so they can start to plan out their own personal career path.

- ***The mentoring program***

Mentoring contributes to the cultural and professional training of the student, encouraging wider and more and active participation throughout the entire degree course.

The mentoring program has the following objectives:

- Assist the student in all aspects of their study
- Encourage different ways of participating in the training process
- Remove barriers to education through initiatives tailored to the needs, aptitudes and requirements of each individual student.

Unicam's Mentoring Program uses and provides specific tutoring activities for both groups and individuals.

It organises a flexible range of teaching tutorials during the teaching year, conducted by tutors who have been chosen for their particular profiles aimed at activities for students who work and for the different teaching approaches required for e-learning.

- Support tutoring: provided by experienced students with the task of helping younger students in organizing their studies and get acquainted with the new environment.
- Group Tutoring: provides scheduled meetings with the course teachers, designed to highlight and resolve, also through input from the students, any problems encountered in the teaching course.
- Individual Tutoring: UNICAM assigns to each student a 'teaching tutor' whose task is to follow and advise the student throughout their course of study through regular meetings and through meetings requested by the student.
- Teaching tutoring: related specifically to basic science courses and to English and organized by means of supplementary courses, especially devoted for filling gaps in the student knowledge.

- ***The opportunity to study abroad***

Unicam offers many possibilities for international mobility:

**ERASMUS for study**

The program allows you to spend a period of study abroad (from 3 to 12 months), providing the opportunity to take courses, to take advantage of university facilities, to conduct research aimed at drafting your degree thesis, and to obtain recognition of exams taken abroad, provided they have been pre-designated in an appropriate study program.

Students who are interested can take part in the annual call from the University published in the period December - February.

**Erasmus Student Placement (internship)**

Starting in the 2007/2008 academic year, within the Erasmus program it is possible to hold internships (from 3 to 12 months) in enterprises, in research centres, and in European training centres, ensuring a recognition of curricular activities carried out abroad, provided there is agreement in advance with their respective Erasmus coordinators.

The Council of Study Programme promotes meetings with the students to encourage the international mobility both to universities within Erasmus programme and to universities where an international cooperation agreement is available. The Council will credit the activities expressed in the learning agreement and carried out in the host university.

The degree course in Chemistry and Advanced Chemical Methodologies involving the Erasmus programme has reached an agreement with the following European universities:

Country	University	Language	Number grants	Duration	Learning Activities
FI - Finland	<i>University of Oulu</i>	English	2	6 months	<i>Final test</i>
B - Belgium	<i>Université Libre de Bruxelles</i>	Franch	1	6 months	<i>Courses/Final test</i>
B - Belgium	<i>University of Gent</i>	Franch / English	1	10 months	<i>Courses/Final test</i>
B – Belgium	<i>University of Antwerp</i>	Franch	1	6 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de Extremadura</i>	Spanish	2	9 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de Granada</i>	Spanish	1	10 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de Burgos</i>	Spanish	1	6 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de Zaragoza</i>	Spanish	2	6 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de la Rioja</i>	Spanish	1	10 months	<i>Courses/Final test</i>
ES – Spain	<i>Universidad de Sevilla</i>	Spanish	3	6 months	<i>Courses/Final test</i>
FR – France	<i>Université de Pau et des Pays de l'Adour</i>	Franch	1	6 months	<i>Courses/Final test</i>
FR – France	<i>Institut National Polytechnique de Toulouse</i>	Franch	2	6 months	<i>Courses/Final test</i>
FR – France	<i>Université Pierre et Marie Curie Paris VI</i>	Franch	2	3 months	<i>Courses/Final test</i>
FR – France	<i>Université Louis Pasteur - Strasbourg</i>	Franch	1	6 months	<i>Courses/Final test</i>
HU - Hungary	<i>University of Szeged</i>	English	1	6 months	<i>Courses/Final test</i>
RO - Romania	<i>University Dunarea de Jos Galati</i>	English	3	5 months	<i>Courses/Final test</i>
RO - Romania	<i>Universitatea Alexandru Ioan Cuza - Iasi</i>	English	5	6 months	<i>Courses/Final test</i>
PT - Portugal	<i>Instituto Superior Tecnico Lisboa</i>	English	2	6 months	<i>Courses/Final test</i>
DE - Germany	<i>Johann Wolfgang Goethe Universität</i>	Deutch	2	6 months	<i>Courses/Final test</i>
PL - Poland	<i>Univwersytet Wroclawski</i>	English	2	3 months	<i>Courses/Final test</i>
GR - Grece	<i>University of Ioannina</i>	English	3	6 months	<i>Courses/Final test</i>
UK – United Kingdom	<i>University of Aberdeen</i>	English	2	5 months	<i>Courses/Final test</i>
MT - Malta	<i>University of Malta</i>	English	2	6 months	<i>Courses/Final test</i>

NL - Holland	<i>Universiteit Utrecht</i>	English	3	6 months	<i>Courses/Final test</i>
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Moreover, the student can access the Erasmus Placement programme providing scholarships to be on a placement at European companies for the development of the thesis and international cooperation programmes available with the master/postgraduate degree course of the University of Camerino with European, non-European universities and companies. Students will get full acknowledgement of the activities carried out abroad within their own curriculum. Students can get a Double Degree from UNICAM and Instituto Superior Tecnico of Lisbon (IST) according to the existing agreement (see section "Double Degree"). For further information, students can turn to the internationalization coordinator. For economic facilities you can visit the following website:

[http://web.unicam.it/international/mobility/socrates\\_erasmus\\_eng.asp](http://web.unicam.it/international/mobility/socrates_erasmus_eng.asp)

or contact Dott. Anna Pupilli - [relazioni.internazionali@unicam.it](mailto:relazioni.internazionali@unicam.it) - Phone: +39 0737 404619

### • **Internships**

The connection between the university and work is one of the priorities at Unicom. Unicom organises meetings and dialogues amongst students, graduates, professionals and companies. In this spirit, the internship is an important tool allowing students, both graduates or recently graduated, to 'practice' in a real working environment, an opportunity to learn directly about working-life and the opportunity to develop, in some cases, a specific expertise.

The University of Camerino has agreements with more than 1800 companies, institutions, administrative and professional offices, where students, both graduates and PhD students, may pursue their internship activities. You can do an internship both in Italy and abroad.

#### **Services offered**

- Management of a database (Unicom Stage) through which internships are offered, to be carried out at companies or at public and private agencies
- Activation of post-graduate internships in companies
- Insertion of the CVs of UNICAM graduates in the online database UnicomJob
- Support activities during entry in the workplace
- Participation in the program 'Work Kit' ('Borsa Lavoro') (a net of online services and an open system for assembling inquiries and offers of work via the Internet:  
[www.unicam.it/laureati/mondolavoro/index.asp](http://www.unicam.it/laureati/mondolavoro/index.asp) )

### • **Services for welcoming students with disabilities**

The 'Welcome Service for Disabled Students' aims at providing students with disabilities equal opportunities in dealing with their studies and the chance to fully live the college experience. This objective is pursued through outreach activities, through technology, and through staff specially dedicated to students and to the removal of the physical and cultural barriers standing in the way of learning and in the way of everyday life.

By contacting the Service Tutors, it is possible map out a training plan, taking into account the particular disability and the individual goals, through the defining of solutions and through personalised participation.

#### **Facilities and services:**

- Technological aids and directed teaching support
- Personalised examinations (for entry and achievement)
- Specialised tutoring
- Transport and relocation
- Procurement and delivery of library materials

- Exemption and reduction of taxes
- Furnished housing with a possible subsidy
- For the companion
- Access to university facilities
- Counseling
- Access to the sports facilities of C.U.S.
- Grants towards participation in the Socrates / Erasmus programmes
- Internships and training directed towards finding employment

## **10. Quality assurance**

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The Bachelor course in Chemistry is within the UNICAM quality management system **certificate ISO 9001:2008** (from **AFAQ-France**, a French leader and one of the first certification bodies at the global level) which guarantees students the quality of services provided. The guarantee is via a rigorous analysis of internal organizational procedures and the prompt addressing of any defects whether detected or reported by the students themselves. The Quality Management System includes the following support services for students: orientation, mentoring, international mobility, internships and placement, communication. These integrate with and support the educational activities, so as to contribute to the complete training of the student.



## Annex

I year											
Corse name	module	SSD activity	Semester	Tipology activity (*)	ECTS	lesson	exercitation	laboratory	Teacher Surname	Teacher name	School
Advanced Physical Chemistry		CHIM/02	I	b	6.0	42			Lavenda	Bernard Howard	Scienze e tecnologie
Advanced Organic Chemistry		CHIM/06	I	b	6.0	42			Cimarelli	Cristina	Scienze e tecnologie
Advanced Inorganic Chemistry		CHIM/03	I	b	6.0	42			Marchetti	Fabio	Scienze e tecnologie
Advanced Analytical Chemistry		CHIM/01	I	b	6.0	42			Marassi	Roberto	Scienze e tecnologie
Physical Methods in Organic Chemistry		CHIM/06	I	b	3.0	14	12		Marcantoni	Enrico	Scienze e tecnologie
Physical Methods in Organic Chemistry		CHIM/06	I	b	3.0	14	12		Barboni	Luciano	Scienze e tecnologie
Industrial and Advanced Synthesis of Biologically Active Compounds	Module I	CHIM/06	II	b	3.0	21			Bosica	Giovanna	Scienze e tecnologie
Industrial and Advanced Synthesis of Biologically Active Compounds	Module II	ING-IND/27	II	c	6.0	42			Marcantoni	Enrico	Scienze e tecnologie
Organic Stereochemistry and Laboratory	Organic Stereochemistry	CHIM/06	II	b	3.0	21			Palmieri	Gianni	Scienze e tecnologie
Organic Stereochemistry and Laboratory	Laboratory of Organic Stereochemistry	CHIM/06	II	b	3.0			36	Cimarelli	Cristina	Scienze e tecnologie
Physical Methods in Inorganic Chemistry		ING-IND/23	II	c	6.0	28	24		Galassi	Rossana	Scienze e tecnologie
Organometallic Chemistry		CHIM/03	II	b	7.0	49			Marchetti	Fabio	Scienze e tecnologie
Instrumental Analytical Chemistry and Laboratory	Instrumental Analytical Chemistry	CHIM/01	II	b	5.0	35			Passamonti	Paolo	Scienze ambientali
Instrumental Analytical Chemistry and Laboratory	Laboratory of Instrumental Analytical Chemistry	CHIM/01	II	b	5.0	7		48	Zamponi	Silvia	Scienze e tecnologie

Chemometrics		CHIM/01	II	b	5.0	14		36	Conti	Paolo	Scienze e tecnologie
Environmental Chemistry and Laboratory	Environmental Chemistry	CHIM/12	II	b	3.0	21			Giovanetti	Rita	Scienze ambientali
Environmental Chemistry and Laboratory	Environmental Chemistry	CHIM/12	II	c	3.0	21			Giovanetti	Rita	Scienze ambientali
Environmental Chemistry and Laboratory	Laboratory of Environmental Chemistry	CHIM/12	II	c	3.0	7		60	Ferraro	Stefano	Scienze ambientali
Sample Preparation in Analytical Chemistry		CHIM/12	II	b	5.0	28		12	Passamonti	Paolo	Scienze ambientali

## II year

Corse name	module	SSD activity	Semester	Tipology activity (*)	ECTS	lesson	exercitation	laboratory	Teacher Surname	Teacher name	School
Green Chemistry	Module I	CHIM/06	I	b	3.0	21			Ballini	Roberto	Scienze e tecnologie
	Module II	CHIM/03	I	b	4.0	28			Bosica	Giovanna	Scienze e tecnologie
Technologies for waste management		CHIM/07	I	c	6.0	42			Giovanetti	Rita	Scienze ambientali
Inorganic Solid State Chemistry		CHIM/03	II	b	7.0	49			Marchetti	Fabio	Scienze e tecnologie
Biomonitoring and environmental Legislation	Module I	BIO/07	I	c	3.0	21			Pucciarelli	Sandra	Bioscienze e biotecnologie
	Module II	IUS/07	I	c	3.0	21			Lorenzotti	Fabrizio	Facoltà di Giurisprudenza
Materials and their interaction with environment		CHIM/07	I	c	6.0	42			Pucciarelli	Filippo	
Electrochemistry		CHIM/01	II	d	4.0	21		12	Marassi	Roberto	Scienze e tecnologie
Supramolecular Chemistry		CHIM/03	II	d	4.0	28			Galassi	Rossana	Scienze e tecnologie
Physical Chemistry of Materials		CHIM/02	II	d	4.0	28			Bacchiocchi	Corrado	Scienze e tecnologie
Inorganic and Organometallic Biochemistry		CHIM/03	II	d	4.0	28			Pettinari	Claudio	Scuola del farmaco
Radiochemistry		CHIM/03	I	d	4.0	28			Santini	Carlo	Scienze e tecnologie
Crystallography		GEO/06	I	d	5.0	35			Giuli	Gabriele	Scienze e tecnologie

**Legend:**

(\*)

- a introductory course
- b core course
- c supplementary course
- d elective course
- e for the final exam and for knowledge of a foreign language
- f other (additional language skills, computer skills, internship/work experience stage etc.)
- s stage