



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**Scuola di Scienze  
Matematiche  
Fisiche e Naturali**

University of Florence

**School of Mathematical, Physical and Natural Sciences**

**Student Orientation Handbook**



In front cover by: Tina Fasulo

Photos by: Tina Fasulo, Adriana Ardy and donations of Degree Courses of the School.

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## UNIVERSITY OF FLORENCE

The University of Florence issues the following qualifications in compliance with Ministerial Decree No. 270/2004:

- Laurea (L): a First Cycle Degree equal to a Bachelor's Degree on completion of an initial three-year study program (180 credits)
- Laurea Magistrale (LM): a Second Cycle Degree equivalent to a Master's degree on completion of a further two-year study program (120 credits)
- Laurea Magistrale a ciclo unico (LM c.u.): a Single Cycle Degree, combining bachelor and master program, offered only in some Schools, on completion of a five- or six-year study program (300 or 360 credits)

Afterwards, for those who have obtained a Laurea Magistrale (LM - Master's Degree):

- Diploma di Specializzazione (DS) – Specialization Diploma
- Dottorato di Ricerca (DR) - PhD

In addition, the University of Florence offers post-graduate vocational Master Courses with one-year (first level) or two-year (second level) study programs (at least 60 credits). These courses offer training at advanced level in specific industry sectors.

## SCHOOL OF MATHEMATICAL, PHYSICAL AND NATURAL SCIENCES

The School of Mathematical, Physical and Natural Sciences runs scientific courses with particular attention to innovation and labour market. It complies with the tradition of research and diligent study, in close connection with the European and international scientific community.

The following Departments, responsible for research activities, teaching programs and knowledge transfer, are part of the School:

- Biology (BIO)
- Chemistry "Ugo Schiff"
- Physics and Astronomy
- Mathematics and Computer Science "Ulisse Dini" (DIMAI)
- Earth Sciences (DST)
- Statistics, Computer Science, Applications "G. Parenti" (DISIA)

### Courses of study

The School of Mathematical, Physical and Natural Sciences coordinates 20 courses of study: 9 Bachelor's Degrees and 11 Master's Degrees:

Bachelor's Degrees – 3 years – 180 credits	Master's Degrees - further 2 years – 120 credits
<ul style="list-style-type: none"><li>• Biological Sciences</li><li>• Chemistry</li><li>• Computer Science</li></ul>	<ul style="list-style-type: none"><li>• Advanced Molecular Sciences (in English)</li><li>• Chemical Sciences</li><li>• Computer Science (curriculum <i>Resilient</i>)</li></ul>

<ul style="list-style-type: none"> <li>● Diagnostics and Materials for Conservation and Restoration</li> <li>● Geological Sciences</li> <li>● Mathematics</li> <li>● Optics and Optometry</li> <li>● Natural Sciences</li> <li>● Physics and Astrophysics</li> </ul>	<p><i>and Secure Cyber Physical Systems</i> in English)</p> <ul style="list-style-type: none"> <li>● Environmental and Behavioural Biology</li> <li>● Geology Science and Technology</li> <li>● Mathematics</li> <li>● Molecular and Applied Biology</li> <li>● Molecular Biotechnologies</li> <li>● Nature and Human Sciences</li> <li>● Physical and Astrophysical Sciences</li> <li>● Science and Materials for Cultural Heritage Conservation</li> </ul>
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### **School Administration and Services**

The School Offices are located in viale Morgagni, 40-44 - 50134 Florence

Website: [www.scienze.unifi.it](http://www.scienze.unifi.it)

Student orientation: [www.scienze.unifi.it/ls-9-orientamento.html](http://www.scienze.unifi.it/ls-9-orientamento.html)

Office of the President and Secretary of the School

mail: [scuola@scienze.unifi.it](mailto:scuola@scienze.unifi.it)

Recognition of foreign academic degrees and access to Master's Degrees (for resident students in Italy)\*

mail: [domandevalutazione@scienze.unifi.it](mailto:domandevalutazione@scienze.unifi.it)

Traineeships and Internships Office (for students of the University of Florence)

mail: [tirocini@scienze.unifi.it](mailto:tirocini@scienze.unifi.it)

International Relations Office

mail [relint@scienze.unifi.it](mailto:relint@scienze.unifi.it); [incoming@scienze.unifi.it](mailto:incoming@scienze.unifi.it)

\*Students residing abroad must contact the International Desk, piazza Ugo di Toscana, 5 - 50127 Firenze – [internationaldesk@unifi.it](mailto:internationaldesk@unifi.it)

### **Sciences Library**

The Sciences Library consists of several branch libraries located within the Florentine metropolitan area.

For information and opening hours: [www.sba.unifi.it/a24.html](http://www.sba.unifi.it/a24.html).

### **Enrolment**

In order to enrol in first cycle programs (Bachelor's degree) applicants must submit the enrolment application between mid-September and mid-October. Exact dates vary from year to year, according to the academic calendar.

All students enrolling in programmes with unrestricted access (no set quota) need to take the self-evaluation test (*prova di verifica*) before sitting any exam. The test is mandatory, but not binding for enrolment. Additional training obligations (*OFA - obblighi formativi aggiuntivi*) may be required, depending on the test result.

Students enrolling in set quota programmes (Bachelor's Degree in Biological Sciences) need to take an admission test (*prova di ammissione*). The test is mandatory and binding for enrolment.

At the time of enrolment students must pay the first instalment fees and charges. For detailed information please refer to the *Manifesto degli Studi* (in Italian), the official source of all relevant information about studying at the University of Florence.

### Useful Links

University of Florence: [www.unifi.it](http://www.unifi.it)

Information for International Students: [www.unifi.it/ls-47-students.html](http://www.unifi.it/ls-47-students.html)

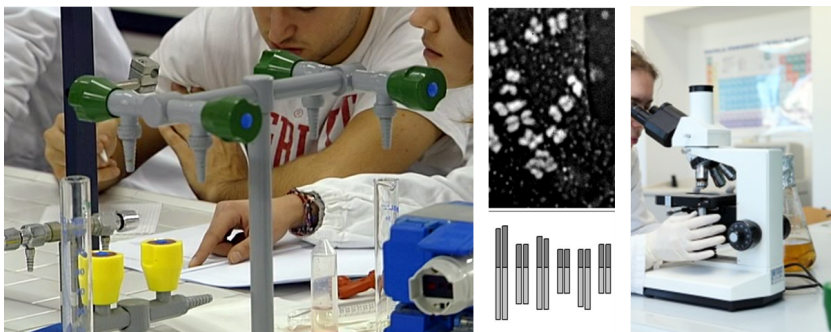
Manifesto degli Studi (in Italian): [www.unifi.it/vp-6385-manifesto-degli-studi.html?newlang=ita](http://www.unifi.it/vp-6385-manifesto-degli-studi.html?newlang=ita)

Courses of the School of Mathematical, Physical and Natural Sciences: [www.scienze.unifi.it/p-lis2-2019-101227-0.html](http://www.scienze.unifi.it/p-lis2-2019-101227-0.html)

Student Handbook of the School of Mathematical, Physical and Natural Sciences (in Italian): [www.scienze.unifi.it/upload/sub/guide/Guida%202019\\_20.pdf](http://www.scienze.unifi.it/upload/sub/guide/Guida%202019_20.pdf)

Invest your talent in Italy: [postgraditaly.esteri.it/postgraditaly/en](http://postgraditaly.esteri.it/postgraditaly/en)





## BIOLOGICAL SCIENCES - ENVIRONMENTAL AND BEHAVIOURAL BIOLOGY - MOLECULAR AND APPLIED BIOLOGY

- Bachelor's Degree in Biological Sciences
- Master's Degree in Environmental and Behavioural Biology
  - 2 Curricula:
    - Behavioural Biology
    - Environmental Biology
- Master's Degree in Molecular and Applied Biology
  - 3 Curricula:
    - Bio-health and Nutrition
    - Cellular and Molecular Biology
    - Forensic Biology
- PhD in Biology

### **Training objectives**

The Bachelor's Degree aims to prepare graduates with a good basic knowledge in the main areas of Biological Sciences and familiar with specific methods of scientific investigation. In particular, graduates in Biological Sciences have to:

- ✓ possess adequate basic knowledge of the various sectors of the biological sciences;
- ✓ acquire multidisciplinary methodological and technological knowledge for biological investigation;
- ✓ possess solid operating and application skills and skills in the biological field, aimed at research, monitoring and control activities;

- ✓ be able to use at least one language of the European Union, in addition to Italian, in the specific field of competence and for the exchange of general information;
- ✓ be in possession of adequate skills and tools for communication and information management;
- ✓ to be able to work in groups, to operate independently and to be integrated into work environments;
- ✓ be able to update their own knowledge.

The main objective of the Master's Degree in Environmental and Behavioural Biology is to train professionals capable of studying and understanding the complexity of natural and anthropic environments, starting from solid knowledge of the interrelations between organisms and their physiological and behavioural responses.

The objectives of the Master's Degree are:

- ✓ to provide a solid and integrated cultural preparation in basic biology, ecology, ethology and their application;
- ✓ to provide advanced preparation for the analysis of interactions between organisms and the biotic and abiotic environment and the evolutionary aspects related to the ecological and behavioral characteristics of natural populations;
- ✓ to provide the cultural, methodological and analytical tools necessary for the design of experimental and sampling designs in ecology and ethology;
- ✓ to guarantee the acquisition of up-to-date instrumental and processing methods including the use of mathematical and IT tools to support research, to analyze biological phenomena at the molecular, cellular, organism, community and ecosystem level.

The Master Degree in Molecular and Applied Biology offers a wide range of application:

- ✓ Bio-health and Nutrition Curriculum: solid cultural preparation of biology applied to biomedical research, of physiological and pathological processes at the molecular, cellular and systemic levels; improved ability to develop experimental sub-cellular, cellular and animal models in the pharmaceutical, nutrition and health products.
- ✓ Cellular and Molecular Biology Curriculum: solid epistemological and cultural preparation in molecular and cellular biology; scientific-operative preparation in the acquisition and analysis of data in molecular and cellular biology of microorganisms and multicellular organisms.



- ✓ Forensic Biology Curriculum: solid cultural and operational preparation regarding collection and storage techniques and analysis of biological samples of judicial seizure; deep knowledge of the legislative procedures of criminal law and forensic medicine for professional practice as consultant.

### **Professional perspectives/outcomes**

The Bachelor's Degree graduates can find employment in these fields:

- ✓ analysis laboratories (microbiological, genetic, bio-health, environmental, hygiene food and forensics);
- ✓ laboratory production and technological activities (bio-health, industrial, food and biotechnology, research institutions and services);
- ✓ environmental impact evaluation, conservation and protection of the environment.

Graduates in the Master's Degree in Molecular and Applied Biology have a preparation suitable to enter professional realities such as:

- ✓ analysis laboratories (microbiological, genetic, bio-health, environmental, hygiene food and forensics);
- ✓ laboratory production and technological activities (bio-health, industrial, food and biotechnology, research institutions and services);
- ✓ bio-advice forensics;
- ✓ teaching science subjects in secondary schools.

The Environmental Biologist will be able to carry out scientific and professional activities in public and private institutions: universities, natural parks, territorial bodies that deal with environmental protection and health; in professional offices dealing with planning and territorial planning, monitoring, certification and environmental recovery. It will also be able to carry out activities on farms that implement integrated pest management and /or organic farming; in environmental education and scientific dissemination services, both in the public and private sectors.

The Behavior Biologist may carry out scientific and professional activities in public and private institutions: universities, natural parks, territorial bodies for the management of wildlife and animals in captivity or semi-captivity; in pharmacology and toxicology laboratories, for the development of behavioral tests; in multidisciplinary teams, in collaboration with the veterinary surgeon, to evaluate the behavior and the indices of stress on farms; in public and private companies involved in assisted interventions with animals; in training institutes, universities, editorial offices and the media involved in the scientific dissemination of research results on the territory.

## Address and information

Department of Biology (BIO), via Madonna del Piano 6, Sesto Fiorentino - [www.bio.unifi.it](http://www.bio.unifi.it)

### Didactic Centers:

Centro Didattico Morgagni, viale Morgagni 40-44, Firenze

Didactic Laboratory of Biology "A. Becciolini", viale Morgagni 57, Firenze.

## Useful links

Bachelor's Degree in Biological Sciences: [www.biologia.unifi.it](http://www.biologia.unifi.it)

Master's Degree in Environmental and Behavioural Biology: [www.bac.unifi.it](http://www.bac.unifi.it)

Master's Degree in Molecular and Applied Biology:

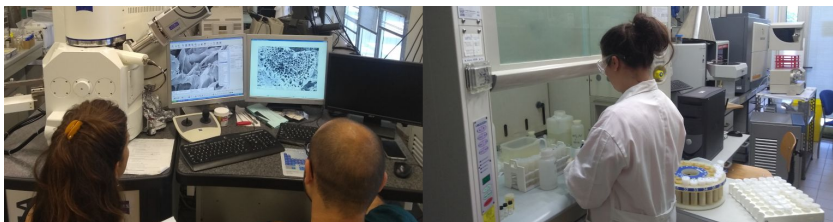
[www.biologiamolecolareapplicata.unifi.it](http://www.biologiamolecolareapplicata.unifi.it)

Student Orientation Bachelor's Degree: [www.biologia.unifi.it/vp-105-orientamento.html](http://www.biologia.unifi.it/vp-105-orientamento.html)

Student Orientation Master's Degree (Environmental and Behavioural Biology): [www.bac.unifi.it/vp-105-orientamento.html](http://www.bac.unifi.it/vp-105-orientamento.html)

Student Orientation Master's Degree (Molecular and Applied Biology): [www.biologiamolecolareapplicata.unifi.it/vp-105-orientamento.html](http://www.biologiamolecolareapplicata.unifi.it/vp-105-orientamento.html)





## CHEMISTRY - ADVANCED MOLECULAR SCIENCES - CHEMICAL SCIENCES

- Bachelor's Degree in Chemistry
  - 2 Curricula:
    - Chemical Sciences
    - Chemical Technologies
- Master's Degree in Advanced Molecular Sciences (in English)
- Master's Degree in Chemical Sciences
  - 5 Curricula:
    - Structure, Dynamics and Chemical Reactivity
    - Supramolecular Chemistry, Chemistry of Materials and Nanosystems
    - Chemistry of the Environment and Cultural Heritage
    - Chemistry of Biological Molecules
    - Synthesis, structure and property of organic compounds
- PhD in Chemical Sciences

### **Training objectives**

The Bachelor's Degree provides a scientific and technical preparation in the various sectors of Chemistry, with good basics of mathematical and physical elements and a sufficient knowledge in the biochemical field. It also aims to provide students with the ability to solve typical chemical problems, both theoretical and experimental, use complex scientific equipment, communicate correctly the results both in Italian and English, use computer tools for data processing and for communication and management of information. Graduates must be able to maintain a behavior that complies with safety standards in a chemical laboratory and are required to carry out and coordinate group work.

The educational training aim of the Master's Degree in Advanced Molecular Sciences is to train a chemist with an extensive knowledge of the common principles that rule the structures, dynamics and functions of complex architecture systems, organized and responsive, both synthetic and natural.

Graduates will also be able to modulate the properties of such systems, in order to design new items with specific desired functionalities that derive from the chemical

nature of the components (of biological, organic or inorganic origin, single or combined) and from their structural organization for applications in different areas.

The course aims at providing a global vision that overcomes the common division between chemistry of materials and chemistry of life sciences and shows how the use of the knowledge of the two areas can synergistically offer new possibilities for the scientific and technological advancement. The graduate will have full mastery of the scientific method, will know the most updated instrumental and data analysis techniques and will be able to independently manage his/her work activity.

The Master' Degree in Chemical Sciences allows a deepening of basic chemical education in various scientific sectors and provides specific skills through the acquisition of methodologies useful for the understanding of phenomena at the molecular level. It aims to train a chemical scientist able to intervene on issues of high scientific and technological content such as those that are increasingly presented both in the field of applied chemistry and in basic research. This degree course intends to give its graduate students a deep knowledge of the most advanced chemical issues, in order to allow them to face the most varied problems of chemical and biochemical nature in a multitude of fields such as medical, environmental and industrial.

### **Professional perspectives/outcomes**

The knowledge and skills acquired allow graduate students in Chemistry to carry out free-professional activities. In industrial or public sector, they can apply standardized methods in research, control and analysis laboratories, as well as directing and organizing tasks in the same laboratories. They can also perform applicative or development tasks in the fields of synthesis and characterization of materials, health, food, environment, energy and conservation of cultural heritage, for example finalized at quality control or the development and use of chemicals. Finally, they can work in the field of education and dissemination of scientific culture.

The Master's Degree allows the graduates to take the national exam for admission to the profession of chemist, subject to registration to the professional Order of Chemists. Graduates in Chemical Sciences and Advanced Molecular Sciences can carry out activities to promote scientific and technological innovation, as well as management and design of technologies; they will also be able to hold high-level responsibilities in various sectors of industry, design, synthesis and characterization of new materials, health, food, environment, energy, safety, cultural heritage and public administration, applying independently the methods of investigation acquired. Finally, master's graduates can work in the field of education and dissemination of scientific culture. They can also access PhD, in Italy or in international institutions.

### **Address and information**

Department of Chemistry "Ugo Schiff", via della Lastruccia 3-13, Sesto Fiorentino - [www2.chim.unifi.it](http://www2.chim.unifi.it)

### Didactic Center:

Polo Scientifico Sesto Fiorentino, via Bernardini 6, Sesto Fiorentino.

### **Useful links**

Bachelor's Degree in Chemistry: [www.chimica.unifi.it](http://www.chimica.unifi.it)

Master's Degree in Advanced Molecular Sciences: [www.master-ams.unifi.it](http://www.master-ams.unifi.it)

Master's Degree in Chemical Sciences: [www.chimicamagistrale.unifi.it](http://www.chimicamagistrale.unifi.it)

Student Orientation Bachelor's Degree:

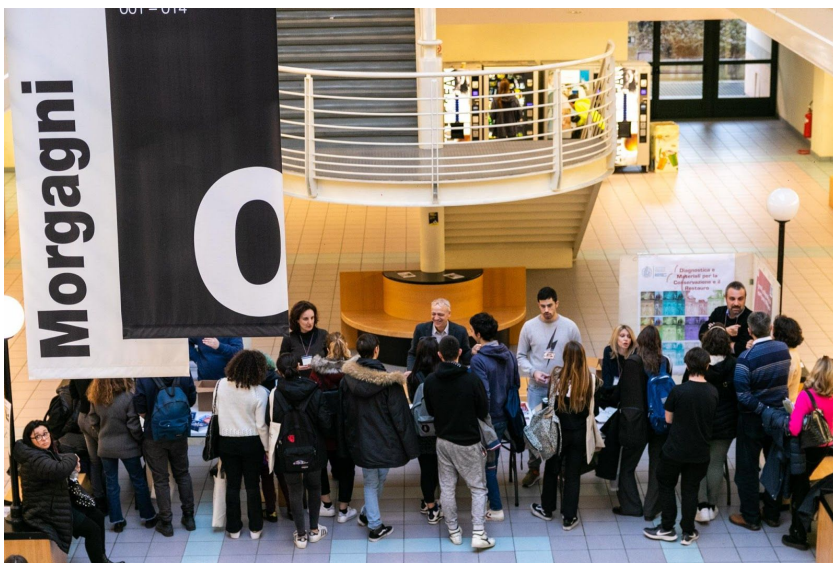
[www.chimica.unifi.it/vp-105-orientamento.html](http://www.chimica.unifi.it/vp-105-orientamento.html)

Student Orientation Master's Degree (Chemical Sciences):

[www.chimicamagistrale.unifi.it/vp-105-orientamento.html](http://www.chimicamagistrale.unifi.it/vp-105-orientamento.html)

Advanced Molecular Sciences Student Guide:

[www.master-ams.unifi.it/vp-168-student-guide.html](http://www.master-ams.unifi.it/vp-168-student-guide.html)





## COMPUTER SCIENCE

- Bachelor's Degree in Computer Science
- Master's Degree in Computer Science
  - 2 Curricula:
    - Data Science
    - Resilient and Secure Cyber Physical Systems (in English)
- PhD in Computer Science

### **Training objectives**

The Bachelor's Degree in Computer Science provides a solid basic education in the field of Computer Sciences, that allows graduated students to perform professional activities that require familiarity with the technologies and techniques for digital systems, the scientific method, and the ability to apply innovative methods.

The Bachelor's Degree in Computer Science provides the theoretical, methodological, experimental and practical skills in all fundamental areas of computer science, also required by many IT companies.

The M.Sc. Degree in Computer Science is structured in two different curricula:

- ✓ Curriculum Data Science (in Italian): it comprises computer science, statistical and numerical analysis techniques aimed to the analysis of large quantities of data. The ultimate objective is developing the ability to design algorithms and systems that retrieve knowledge from the data and implement automatic learning from samples, while maintaining privacy of the individuals.
- ✓ Curriculum Resilient and Secure Cyber-Physical Systems (in English): it merges computer science and engineering notions for the definition, design,

assessment and certification of all those kinds of systems that comprise a cyber and a physical part, as for the example the Internet of Things (IoT) or Critical Infrastructures.

The Master's Degree in Computer Science aims to develop deep knowledge on the theoretical, methodological, and technical foundations in the main field of computer science and ancillary disciplines. The main learning objectives that shall be developed are here summarized:

- ✓ deep knowledge and understanding of the principles of computer science, as well as of the research frontiers for selected topics;
- ✓ ability to combine theory and practice to solve computer science problems, being able to reason at the appropriate abstraction level, also exploiting technologies and techniques from ancillary disciplines;
- ✓ ability to apply the state of the art, or innovative methods, for the solution of problems in the real world, possibly including related disciplines and developing novel approaches or methods;
- ✓ reach an adequate level of autonomy in exercising professional activities, and good team leadership and team management skills;
- ✓ ability to work and communicate effectively in national and international contexts.

### **Professional perspectives/outcomes**

Typical professional figures of the Bachelor's Degree are:

- ✓ software and system architect
- ✓ software developer
- ✓ networks administrator

The Bachelor's Degree in Computer Science allows direct access to the Master's Degree in Computer Science at the University of Florence. In addition, it allows the admittance, upon passing an examination, in the Register of Information Engineering (Albo degli Ingegneri dell'Informazione).

The typical professional activities for the Master's Degree in Computer Science are in the field of design, planning, management, and maintenance of ICT systems. The target companies embrace IT companies, public administration, and in general all companies that rely on complex and innovative ICT systems.

The graduated student will also have the background knowledge to enrol for PhD studies and eventually perform research and teaching activities.

Graduated students have the opportunity to apply for the professional Register in Information Engineering (Albo degli Ingegneri dell'informazione).

#### **Address and information**

Department of Mathematics and Computer Science "Ulisse Dini" (DIMAI), viale Morgagni 67/a, Firenze - [www.dimai.unifi.it](http://www.dimai.unifi.it)

Department of Statistics, Computer Science, Applications "G. Parenti" (DISIA), viale Morgagni 59, Firenze - [www.disia.unifi.it](http://www.disia.unifi.it)

#### Didactic Center:

Centro Didattico Morgagni, viale Morgagni 40-44, Firenze

#### **Useful links**

Bachelor's Degree in Computer Science:

[www.informatica.unifi.it/changelang-eng.html](http://www.informatica.unifi.it/changelang-eng.html)

Master's Degree in Computer Science:

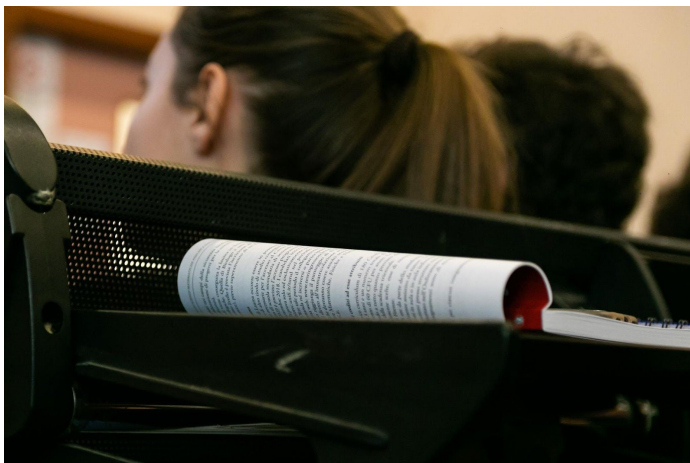
[www.informaticamagistrale.unifi.it/changelang-eng.html](http://www.informaticamagistrale.unifi.it/changelang-eng.html)

Student Orientation Bachelor's Degree:

[www.informatica.unifi.it/vp-216-orientation.html](http://www.informatica.unifi.it/vp-216-orientation.html)

Student Orientation Master's Degree:

[www.informaticamagistrale.unifi.it/vp-173-incoming-and-outbound-orientation.html](http://www.informaticamagistrale.unifi.it/vp-173-incoming-and-outbound-orientation.html)







## DIAGNOSTICS AND MATERIALS FOR CONSERVATION AND RESTORATION - SCIENCE AND MATERIALS FOR CULTURAL HERITAGE CONSERVATION

- Bachelor's Degree in Diagnostics and Materials for conservation and restoration
- Master's Degree in Sciences and Materials for cultural heritage conservation
- PhD in Chemical Sciences

### **Training objectives**

The purpose of the Degree Course is the creation of an expert specialized in scientific diagnostics and material science, so to ensure the preservation and conservation of cultural heritage materials. In particular specialists from this Degree Course correspond to the Conservation Scientist already existing in many countries. This professional should be as important as other cultural heritage experts (e.g. art historians, architects, archaeologists, etc.), stimulating also the update of institutions like Cultural Heritage Departments and Archeological Museums to the European and global standards.

Therefore, one of the main tasks of the Degree Course is to help students in developing a proper mental attitude by giving them both theoretical and practical knowledge from the first year of the Degree Course Program (e.g. experimental techniques performed on cultural heritage artifacts). For this reason, the Degree Program is split in theoretical and laboratory courses: the first aimed at providing basic skills in chemistry, mathematics, physics, mineralogy, petrography, biology, the latter focused on experimental and data processing methodologies.

### **Professional perspectives/outcomes**

Graduates will have solid scientific skills combined with knowledge in art history, archaeology and architecture. They will be able to make diagnoses on cultural heritage materials, to evaluate degradation processes, and to assess suitable technologies and materials for conservation and restoration. These skills will allow them to work in Universities, Research Centers, laboratories in Cultural Heritage Departments, in Restoration Institutes and companies, as well as freelance professionals and consultants. Graduates may work in organizations involved in the management and preservation of cultural heritage, in local agencies, and institutions like cultural heritage departments, museums, libraries, archives.

### **Address and information**

Department of Chemistry "Ugo Schiff", via della Lastruccia 3-13, Sesto Fiorentino - [www2.chim.unifi.it](http://www2.chim.unifi.it)

Department of Biology (BIO), via Madonna del Piano 6, Sesto Fiorentino - [www.bio.unifi.it](http://www.bio.unifi.it)

Department of Physics and Astronomy, via Giovanni Sansone, 1, Sesto Fiorentino - [www.fisica.unifi.it](http://www.fisica.unifi.it)

Department of Mathematics and Computer Science "Ulisse Dini" (DIMAI), viale Morgagni 67/a, Firenze - [www.dimai.unifi.it](http://www.dimai.unifi.it)

Department of Earth Sciences (DST), via G. La Pira, 4, Firenze - [www.dst.unifi.it](http://www.dst.unifi.it)

### Didactic Centers:

Polo Scientifico Sesto Fiorentino, via Bernardini 6, Sesto Fiorentino.

Polo Centro: via Capponi 9, Firenze - via G. La Pira 4, Firenze - via San Gallo 40, Firenze - via del Proconsolo 12, Firenze - via Santa Reparata 93, Firenze.

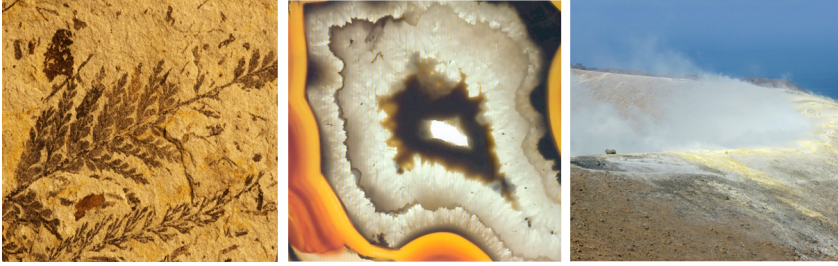
### Useful links

Bachelor's Degree in Diagnostics and Materials for Conservation and Restoration:  
[www.tecnologie-restauro.unifi.it](http://www.tecnologie-restauro.unifi.it)

Master's Degree in Sciences and Materials for Cultural Heritage Conservation:  
[www.scienze-restauro.unifi.it](http://www.scienze-restauro.unifi.it)

Student Orientation: [www.tecnologie-restauro.unifi.it/vp-105-orientamento.html](http://www.tecnologie-restauro.unifi.it/vp-105-orientamento.html)





## GEOLOGICAL SCIENCES - GEOLOGY SCIENCE AND TECHNOLOGY

- Bachelor's Degree in Geological Sciences
- Master's Degree in Geology Science and Technology
  - 4 Curricula:
    - Analysis and Evolution of the Earth System
    - Geotechnologies for the Environment and the Territory
    - Dynamics of Volcanic Systems
    - Environmental Geology and Georesources
- PhD in Earth Sciences

### Training Objectives

The Bachelor's Degree in Geological Sciences is aimed at providing the student with the basic elements and skills necessary for the development of the basic "geologist".

The Master's Degree in Geology Science and Technology provides:

- ✓ adequate mastery of the contents of the chemical, physical, mathematical and IT disciplines that are related to the different areas of Earth Sciences;
- ✓ knowledge of the characteristics (processes, history and materials) of the Earth System and of the interactions between its parts;
- ✓ ability to describe and interpret the transformations underway in the physical environment of the Planet, study its causes, draw from the evidence of the past predictive indications;
- ✓ ability to apply the concepts of Earth Sciences to the needs of human societies in terms of: rational research and sustainable use of geo-resources; mitigation of environmental risks; strategic infrastructure planning.

### Professional perspectives/ outcomes

Graduates in Geological Sciences can work in areas such as:

- ✓ geological and thematic mapping,
- ✓ land management and environmental impact assessment,

- ✓ geo-gnostic investigations and exploration of the subsoil,
- ✓ finding and managing geo-resources
- ✓ assessment and prevention of degradation of cultural and environmental heritage,
- ✓ paleoclimatology and climatic variations,
- ✓ analysis and certification of geological materials
- ✓ the preparation and management of geo-paleontological and mineralogical museums.

The different professional skills acquired can be expressed through: freelance activity after registration in the Regional Register of Geologists, employment in companies and public bodies.

### **Address and information**

Department of Earth Sciences (DST), via G. La Pira, 4, Firenze - [www.dst.unifi.it](http://www.dst.unifi.it)

### Didactic Centers:

Polo Centro: via Capponi 9, Firenze - via Laura 48, Firenze.

### **Useful links**

Bachelor's Degree in Geological Sciences: [www.geologia.unifi.it](http://www.geologia.unifi.it)

Master's Degree in Geology Science and Technology:

[www.geologiamagistrale.unifi.it](http://www.geologiamagistrale.unifi.it)

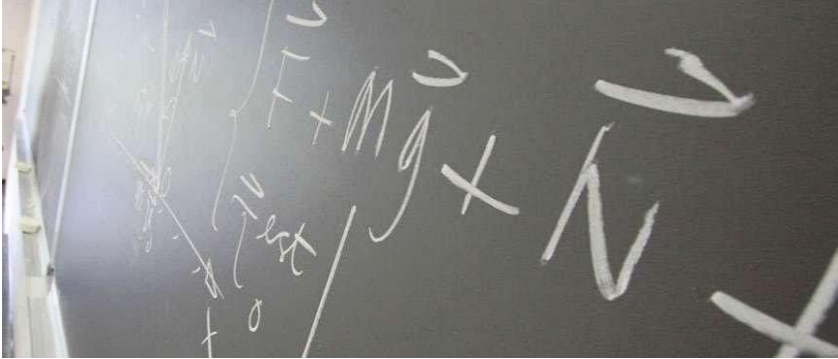
Student Orientation Bachelor's Degree:

[www.geologia.unifi.it/vp-122-orientamento-in-itinere.html](http://www.geologia.unifi.it/vp-122-orientamento-in-itinere.html)

Student Orientation Master's Degree:

[www.geologiamagistrale.unifi.it/vp-105-orientamento.html](http://www.geologiamagistrale.unifi.it/vp-105-orientamento.html)





## MATHEMATICS

- Bachelor's Degree in Mathematics
  - 2 Curricula:
    - Pure Mathematics
    - Applied Mathematics
- Master's Degree in Mathematics
  - 3 Curricula:
    - Pure Mathematics
    - Applied Mathematics
    - Mathematics for Teaching
- PhD in Mathematics

### Training objectives

The Bachelor's Degree has as primary objective the basic preparation of the students for the continuation of the studies in the Master's Degree in Mathematics, both in the theoretical field and in the field of modeling or IT applications. In addition, the acquisition of immediate working market spendable skills is provided. At the end of the course the student will achieve a solid mathematical knowledge as well as the ability to manage the applications of tools given by his studies.

The qualifying objectives, therefore, provide for the acquisition of:

- ✓ adequate basic knowledge in the area of Mathematics;
- ✓ computational and IT skills;
- ✓ ability to understand and use mathematical descriptions and models of concrete situations related to scientific or economic interest;
- ✓ ability to work in a group and to be readily integrated in the workplace.

The Master's Degree in Mathematics is divided into three different curricula:

- ✓ Pure Mathematics Curriculum: it is addressed to students wishing to increase their skills and knowledge of the most advanced mathematical topics. This formative journey will be, therefore, the premise to run research in the various fields of Mathematics, or of careers in the field of scientific publication.
- ✓ Applied Mathematics Curriculum: it allows graduates to find a job in the sectors where both abstraction skills typical of a mathematical training, and specific knowledge in the application of mathematics, are required. It will be furthermore the basis for the research in the field of Applied Mathematics and Numerical Calculus.
- ✓ Mathematics for Teaching Curriculum: it aims to provide all the scientific expertise, tools, and teaching ability that are necessary for teaching mathematics at secondary school level. In addition to general knowledge and tools, a more specific knowledge, both in the logical-informatic field and in the preparation of academic experiences, is provided.

### **Professional perspectives/outcomes**

Almost all the bachelor's graduates continue their study with the Master's Degree in Mathematics.

The main work perspectives are offered in:

- ✓ industry, commerce, the advanced tertiary sector and all sectors of the new economy, in those of credit, insurance and finance;
- ✓ the research activity in public or private institutions (after the Master's Degree), PhD and/or specializations;
- ✓ the IT sphere: computer security, codes, cryptography, data transmission acknowledgments and authentications, graphics, computational geometry and computer aided geometric design;
- ✓ teaching, for Master's Degree graduates, and more generally the employing in the world of scientific divulgation.

### **Address and information**

Department of Mathematics and Computer Science "Ulisse Dini" (DIMAI), viale Morgagni 67/a, Firenze - [www.dimai.unifi.it](http://www.dimai.unifi.it)

### Didactic Center:

Department of Mathematics and Computer Science "Ulisse Dini" (DIMAI), viale Morgagni 67/a, Firenze

### Useful link

Bachelor's Degree in Mathematics: [www.matematica.unifi.it](http://www.matematica.unifi.it)

Master's Degree in Mathematics: [www.matematicalm.unifi.it](http://www.matematicalm.unifi.it)

Student orientation Bachelor's Degree:

[www.matematica.unifi.it/vp-105-orientamento.html](http://www.matematica.unifi.it/vp-105-orientamento.html)

Student Orientation Master's Degree

[www.matematicalm.unifi.it/vp-105-orientamento.html](http://www.matematicalm.unifi.it/vp-105-orientamento.html)







## NATURAL SCIENCES - NATURE AND HUMAN SCIENCES

- Bachelor's Degree in Natural Sciences
- Master's Degree in Nature and Human Sciences
  - 2 Curricula:
    - Nature Conservation and Management
    - Anthropological Sciences
- PhD in Biology

### Training objectives

The Bachelor's Degree Course in Natural Sciences aims at training graduates with a solid general scientific approach and good basic naturalistic knowledge, possessing a global understanding of the environment and its historical development. They will be required to have strong practical skills not only of the scientific method, but also in monitoring and intervention techniques for the solution of environmental problems, both in wild and anthropized environments.

The Master's Degree in Nature and Human Sciences, divided in two curricula, aims at training graduates able to carry out activities in both basic and applied naturalistic research, and perform operational tasks in the management and conservation of protected areas and biodiversity, in the communication and dissemination of environmental issues and naturalistic knowledge, in the analysis and description of the evolution of the past and present ecosystems, in the drafting, for the naturalistic part, of territorial planning documents, in monitoring the quality of the environment in impact assessment studies.

### Professional perspectives/outcomes

The elective fields of employment of the graduate in Natural Sciences can be chosen in different areas:

- ✓ agencies responsible for planning and management of natural resources;
- ✓ agencies managing the naturalistic heritage;
- ✓ public social and health organization/structures;
- ✓ private professional studies engaged in research relating to the analysis and evaluation of natural resources, to the assessment of the environmental

- impact, to the elaboration of spatial planning tools, to interventions of environmental recovery;
- ✓ teaching in high schools/secondary schools and in the lower secondary school, after the Master's Degree;
  - ✓ in the field of scientific research, in Natural History Museums, Botanical Gardens and Herbariums.

The "Nature Conservation and Management" Curriculum of the Master's Degree is intended to train specialists able to interact with national and international organizations, responsible for the conservation of biodiversity and interested in ensuring a sustainable use of resources and the management of problems related to global changes. The professionals trained in this curriculum will manage to interact with NGOs and consulting and planning companies.

The "Anthropological Sciences" Curriculum plans to train graduates with advanced knowledge in the field of anthropological disciplines, with particular attention to the aspects related to human physical and cultural evolution, to the applications of anthropological sciences to cultural and environmental heritage, to the applications in the anthropometric and ergonomic field, to the aspects related to cultural diversity.

### **Address and information**

Department of Biology (BIO), via Madonna del Piano 6, Sesto Fiorentino - [www.bio.unifi.it](http://www.bio.unifi.it)

### Didactic Centers:

Department of Biology, via del Proconsolo, 12, Firenze

Department of Biology, via G. La Pira 4, Firenze

Centro Didattico Morgagni, viale Morgagni 40-44, Firenze

Didactic Laboratory of Biology "A. Becciolini", viale Morgagni 57, Firenze.

### **Useful links**

Bachelor's Degree in Natural Sciences: [www.scienzeaturali.unifi.it](http://www.scienzeaturali.unifi.it)

Master's Degree in Nature and Human Sciences:

[www.scienzeaturalimagistrale.unifi.it](http://www.scienzeaturalimagistrale.unifi.it)

Student Orientation: [www.scienzeaturali.unifi.it/vp-105-orientamento.html](http://www.scienzeaturali.unifi.it/vp-105-orientamento.html)





## OPTICS AND OPTOMETRY

- Bachelor's Degree in Optics and Optometry

### **Training Objectives**

The Bachelor's Degree in Optics and Optometry aims to train professionals able to operate in the optical-optometric field, also in the perspective of a reorganization of the sector to comply it with European standards. The degree provides students with a solid foundation in classical and modern physics as in optics and optometry. Graduate students will be able to:

- ✓ manage competently the most complex optical/optometric equipment present in the market;
- ✓ provide specialized technical/scientific support in the fields where optical methodologies and instruments are developed and used;
- ✓ have a good control of the optical processes of the visual system.

### **Teaching organization**

The course is based in Vinci (FI), it is incorporated within the Department of Physics and Astronomy and takes advantage of the collaboration of the School of Human Health Sciences of the University of Florence, of the INO (National Institute of Optics) and IRSOO (Institute of Research and Studies in Optics and Optometry). The degree offers to the students a wide range of laboratory activities carried out at the IRSOO, and an internship to be carried out at the laboratories of the University, or at public or private organizations operating in the field of optics and optometry.

### **Professional perspectives/outcomes**

Graduates in Optics and Optometry have a preparation suitable to enter professional realities, operating in optics and vision, both in private and public sectors. Graduates in Optics and Optometry will be able to exercise the following activities:

- ✓ in the professional sector: entrepreneur, freelance, professional employee in optical and optometric companies;

- ✓ in the industrial sector: researcher and supervisor (optical instrumentation, ophthalmic and contact lenses, contact lens maintenance solutions);
- ✓ in the commercial sector: assistant to product development by the customer, after-sales assistance, market development and applications.

### Address and information

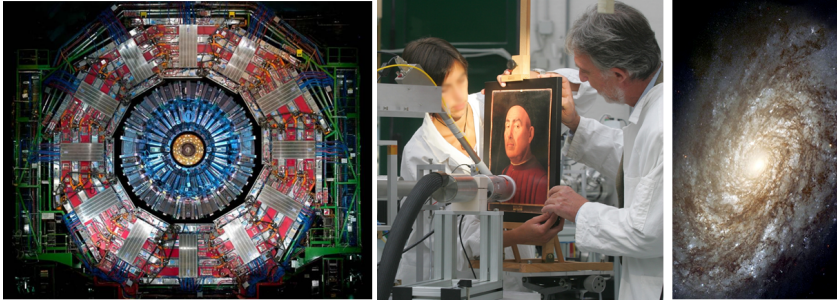
The classrooms are located at the Institute of Research and Studies in Optics and Optometry (IRSOO), Piazza della Libertà 18, Vinci (FI).

### Useful links

Bachelor's Degree in Optics and Optometry: [www.optica.unifi.it](http://www.optica.unifi.it)

Student Orientation: [www.optica.unifi.it/vp-105-orientamento-e-tutorato.html](http://www.optica.unifi.it/vp-105-orientamento-e-tutorato.html)





## PHYSICS AND ASTROPHYSICS – PHYSICAL AND ASTROPHYSICAL SCIENCES

- Bachelor's Degree in Physics and Astrophysics
- Master's Degree in Physical and Astrophysical Sciences
  - 4 Curricula:
    - Astrophysics
    - Matter Physics
    - Nuclear and Sub-nuclear Physics
    - Theoretical Physics
- PhD in Physics and Astronomy

### Training objectives

Achieve a solid basic preparation in mathematics, computer science, chemistry, and especially in classical and modern physics, which allows the graduates in Physics and Astrophysics both to refine their scientific and professional skills in second degree courses level, or to enter into work activities that require familiarity with the scientific method.

Acquire an open and flexible mentality, prone to the rapid learning of survey methods and innovative technologies, and acquire the ability to use complex equipment.

### Professional perspectives/outcomes

More than 90% of Bachelor's Degree graduates continue their studies by enrolling in the Master's Degree in Physical and Astrophysical Sciences.

The perspectives for Master's Degree graduates can be:

- ✓ fundamental or applied research in public or private bodies. This career is normally undertaken after obtaining also a Ph.D. in Physics or Astronomy and some experience as a postdoc, in Italy or abroad;
- ✓ technologically advanced industries, software companies, electronics companies, credit and finance institutes, advanced tertiary sector;

- ✓ laboratories of radioprotection, diagnostics and medical therapy, analysis of historical or artistic material, of acquisition and processing of environmental data;
- ✓ teaching in secondary education.

### **Address and information**

Department of Physics and Astronomy, via G. Sansone, 1, Sesto Fiorentino - [www.fisica.unifi.it](http://www.fisica.unifi.it)

### Didactic Center:

Polo Scientifico Sesto Fiorentino, via Bernardini 6, Sesto Fiorentino.

### **Useful links:**

Bachelor's Degree in Physics and Astrophysics: [www.fis-astro.unifi.it](http://www.fis-astro.unifi.it)

Master's Degree in Physical and Astrophysical Sciences: [www.fis-astro-lm.unifi.it](http://www.fis-astro-lm.unifi.it)

Student orientation Bachelor's Degree:

[www.fis-astro.unifi.it/vp-187-orientamento.html](http://www.fis-astro.unifi.it/vp-187-orientamento.html)

Student orientation Master's Degree:

<http://www.fis-astro-lm.unifi.it/vp-105-orientamento.html>





## MOLECULAR BIOTHECNOLOGIES

- Bachelor's Degree in Biotechnologies (School of Human Health Sciences)
- Master's Degree in Molecular Biotechnologies

### Training Objectives

The training of the Master's degree in Molecular Biotechnologies is based on the acquisition of experimental scientific methods applied to biological systems.

The training course includes the acquisition of solid knowledge on:

- ✓ structure-function of biological macromolecules and the cellular processes in which they intervene;
- ✓ traditional and biotechnological analytical tools;
- ✓ proteomics and genomics, molecular and cellular bases of different biological systems (eukaryotic cells, bacteria, viruses) as well as industrial biotechnological plants problems.
- ✓ organisms used for biotechnological and biological research.

In addition, the course identifies areas of biology, life sciences and biomedicine, in which biotechnologies (Drug Design) are widely used, and the development of biomaterials.

### Professional perspectives/outcomes

The Master's Degree in Molecular Biotechnology aims to train graduates who are experts in professional research and development in areas related to the bio-molecular, chemical, biochemical, genetic and structural biological macromolecules disciplines.

Thanks to the excellent level of competence, graduates in Molecular Biotechnologies will be able to operate in different environments. They will:

- ✓ carry out research and management roles in bio-industrial productions and different transformation processes related to them;
- ✓ carry out activities of promotion and development of innovative scientific and technological research in the biotechnologies related to diagnostics, chemistry, environment, agricultural food industry;
- ✓ undertake private professional activity in consultancy and control agencies in different sectors (industry, law and environment);

- ✓ carry out activities of high responsibility in the field of scientific research applied to biotechnologies.

### Address and information

Department of Chemistry "Ugo Schiff", via della Lastruccia 3-13, Sesto Fiorentino - [www2.chim.unifi.it](http://www2.chim.unifi.it)

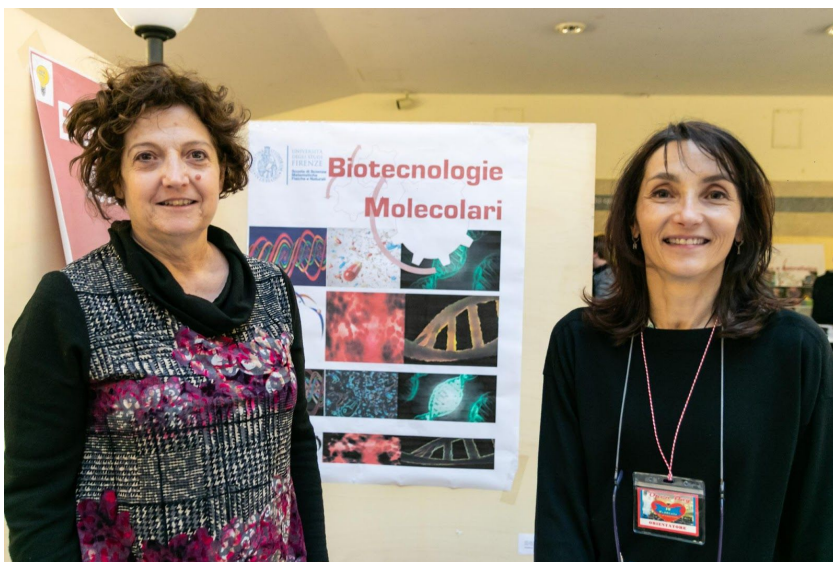
### Didactic Center:

Polo Scientifico Sesto Fiorentino, via Bernardini 6, Sesto Fiorentino.

### Useful links

Master's Degree in Molecular Biotechnologies: [www.biotechnologiemolecolari.unifi.it](http://www.biotechnologiemolecolari.unifi.it)

Student Orientation: [www.biotechnologiemolecolari.unifi.it/vp-105-orientamento.html](http://www.biotechnologiemolecolari.unifi.it/vp-105-orientamento.html)





## MASTER'S PROGRAMMES ISSUING A DOUBLE DEGREE

### **Master's Degree in Mathematics at the University of Florence and Master's Degree in Mathematics Engineering at Complutense University of Madrid**

An agreement between the Complutense University of Madrid and the University of Florence allows 5 students, enrolled in the first or second year of the Master's Degree in Mathematics, to attend the courses agreed between the two universities and to take exams and tests.

The minimum period of study abroad is one semester and the student must obtain at least 30 ECTS, which may include the internship.

Every academic year the School of Mathematical, Physical and Natural Sciences publishes a call to promote the participation of its students.

#### **Useful links**

[www.scienze.unifi.it/vp-128-accordo-universita-complutense-di-madrid.html](http://www.scienze.unifi.it/vp-128-accordo-universita-complutense-di-madrid.html)

### **Master's Degree in Chemical Sciences at the University of Florence and Master's Degree in Advanced Chemistry at the University of Burgos**

An agreement between the University of Burgos and the University of Florence allows 10 students, enrolled in the Master's Degree in Chemical Sciences, to attend the courses agreed between the two universities and to take exams and tests.

The minimum period of study abroad is one semester and the student must obtain at least 30 ECTS.

Every academic year the School of Mathematical, Physical and Natural Sciences publishes a call to promote the participation of its students.

#### **Useful**

**links:** [www.scienze.unifi.it/vp-178-accordo-stilato-tra-l-universita-degli-studi-di-firenze-e-l-universita-di-burgos-in-spagna.html](http://www.scienze.unifi.it/vp-178-accordo-stilato-tra-l-universita-degli-studi-di-firenze-e-l-universita-di-burgos-in-spagna.html)

