

## **Faculty of Sciences and Technologies**

Class 27 – Sciences and Technologies for the Environment and Nature

**GUIDE 2008/2009** for the degree in **Sciences for Nature and the Environment**

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## **THREE YEAR DEGREE CLASS 27**

### **Presentation**

The degree program in **Sciences for Nature and the Environment** provides graduates with a solid systematic foundation of knowledge about the natural and anthropized environment. By definition, **naturalists** are devoted to the protection and management of our natural inheritance, drawing upon the criteria of environmental sustainability. After years of little interest, now the urgency of safeguarding of “our” planet is felt at all levels and demonstrated in world-level conferences and events, and in treaties signed by many nations (for example, those of Rio de Janeiro, Johannesburg, and Kyoto). Consciousness-raising about environmental problems is already underway in primary and secondary schools, and the degree program in **Sciences for Nature and the Environment** is the direction of choice for continuing this path of formation. In fact, this program provides and develops:

- advanced interdisciplinary knowledge of nature and the environment
- analytical skills and abilities
- capacity for observation and practice on site
- apprenticeships in the world of work

### **Prerequisites for admission**

For Admission to the Class 27 Degree Program, knowledge of the program of study required to pass the Secondary School final exam is necessary and sufficient.

All students enrolling in the Class 27 degree programs are provided the opportunity to participate in an "entrance interview" to orient them toward supplementary courses or preparatory formation activities judged useful for optimizing their success with the curriculum. The President of the Class Council nominates a commission composed of three members of the teaching staff to organize the entrance interviews. The dates of the interviews are indicated year by year in the Student Guide.

No entrance test is required.

### **Objectives**

The goal of the degree program is to provide a solid foundation in naturalist sciences suitable for immediate entrance into the world of work, as well as for further study in the field.

The concentrations within the degree program aim at the acquisition of further knowledge in sectors acknowledged as fundamental for the development of issues concerning the reading, analysis, management and conservation of the natural environment in its biotic and abiotic components. Graduates of the Level 1 degree program are able to

<b>1- Knowledge and understanding</b>	a) understand the fundamentals of the various sectors and apply the scientific method of inquiry.
<b>2- Applying knowledge and understanding</b>	a) utilize instruments useful for addressing topics related to natural, seminatural and anthropic systems; b) utilize and develop methods of analysis and monitoring in naturalistic-environmental subjects for land management and planning.
<b>3- Autonomy in forming judgements</b>	a) adapt their knowledge of natural and energetic resources to provide technical-scientific support for use and management of these resources; b) act with autonomy and judgment in work environments and collaborate in groups.
<b>4-Communication skills</b>	a) utilize appropriate instruments for communicating and managing information; b) utilize English to facilitate exchange of both general information and that of their specific area of competence.
<b>5- Learning skills</b>	a) employ skills acquired during the degree program to pursue with autonomy: - further studies - continual updating of their knowledge - the specialistic activities required by their work environments

The degree program offers two concentrations:

- Analysis of resources and natural systems
  - Formative activity is organized to provide the foundational knowledge necessary to understand, analyze and evaluate naturalistic-environmental problems. Topics addressed are: biocoenosis surveying, thematic cartography, nature conservation, elements of earth sciences, applied ecology, health and the territory.
  - Environmental sustainability and energy resources
- Formative activity is organized to provide foundational knowledge, develop skills in analysis and evaluation of the environment in its various components, study the

problem of energy in relation to procurement, energy savings, and environmental pollution.

### Occupation

Graduates with the degree in Sciences for Nature and the Environment find places in the world of work:

- in entities that operate in territory management and planning (Regions, Provinces, Public Entities, Municipalities, and Entities for protected areas), carrying out technical or professional roles in the following spheres
  - a) evaluation of environmental impact and influence
  - b) consultants in fields of naturalistic concerns
  - c) in the field of environmental education (CEA)
  - d) in museum activities
  - e) consultants in development of quality systems
  - f) nature-related publishing
  - g) environmental census-taking and monitoring

Roles and professional profiles according to the ISTAT code:

- 2.2.2.0. landscape architect
- 2.3.1.1. biologist, botanist, zoologist and similar
- 2.5.4.5.3. museum curatorship
- 3.1.5.3.0. environmental assessment technician
- 2.3.1.3. agronomical and forestal technician
- 3.4.1.5.1. nature guide
- 3.1.1.1.3. technician in energy savings and renewable energy 3.1.5.4.1. technicians in waste collection and disposal

## COURSEWORK ORGANIZATION

### Modality:

For this three year degree 180 CFU are required.

Teaching is carried out in the traditional manner with face to face lessons and/or classroom and field work.

The lessons are divided into two periods of at least twelve weeks each, from early October to mid-June, with a mid-year pause of at least four weeks.

For the academic year 2008/2009 the teaching periods will be:

**1st- October 1, 2008 – January 20, 2009**

**2nd- March 2, 2009 - June 12, 2009**

The class government may establish a two-week interval mid-semester for possible partial exams or exams for students enrolled in previous years with trimester sessions.

The class government may organize the formative activities in modules if deemed necessary or useful.

### Exams:

Exams are held during the breaks and in the months of June, July and September.

Teaching staff may give written or oral tests during the teaching period and tests at the end of each teaching module (where foreseen).

### Graduation ceremony calendar:

MONTH	DAY	YEAR
JUNE	27	2008
JULY	25	2008
SEPTEMBER	-----	2008
OCTOBER	03	2008
NOVEMBER	7	2008
DECEMBER	19	2008
JANUARY	-----	2009
FEBRUARY	20	2009
MARCH	13	2009
APRIL	08	2009

### Lesson schedule:

The lesson schedule will be posted in the Teaching Centers and published on the UNICAM web site before the beginning of each academic period.

### Internships

Having completed their coursework, students carry out an internship at businesses, public or private laboratories, parks, or museums, or with Italian or foreign universities, including possibilities through international agreements (the Erasmus program, for example). It is also possible to have an internship at a UNICAM laboratory, if the choice is well-motivated and approved by the Faculty Council.

A minimum of 7 CFU are awarded for the internship, corresponding to 175 hours of work. Extra hours can be awarded free credits. In order to receive credits for the internship, the student's presence at the internship must be demonstrated and a report on the activities conducted must be presented and co-signed by the student's tutor.

### Tutorship

Two initiatives are offered for students enrolling at UNICAM:

**1- Orientation Days:** In September, all first year students at UNICAM are provided free orientation days, during which they have the opportunity to meet their degree program teaching staff for "entrance interviews" and speak with recent graduates or those about to graduate, who will help present the organization and characteristics of the program. Participants will be given free lodging and meals at the university campus or the campus dormitories, and the university cafeteria or eateries that have an agreement with the university.

### 2- Supplementary courses

The goal of these courses, offered for students who have enrolled at UNICAM or will do so, is to overcome (to the extent possible in the time given) the gaps in their formation that make their preparation insufficient for university level work.

The courses take place in September and October, and are organized for fundamental activities such as Chemistry, Mathematics, Computer Science, and Physics.

**Tutorship activities**, which take place during the entire period of the supplementary courses, involve the institution of support tutors, organization of group tutorship meetings, and above all, assignment of a teacher-tutor to each student.

### CFU value:

A university formative credit (CFU) corresponds to 25 hours of student work, divided as follows:

1 CFU = 8 hours of face to face lessons + 17 hours of individual study

1 CFU = 12 hours of exercises/laboratories/excursions + 13 hours of individual study

For some foundational activities, the CFU corresponding to 7 hours of face to face lessons has been chosen (for example, foundations in Mathematics and Computer Science.)

### Final exam and attainment of the degree

Candidates must write a report on their internship activities and present it in a discussion with the Graduation Commission, highlighting the skills they have developed and the knowledge acquired. The Commission will evaluate this 2 CFU exam and the candidates' grade point average, and assign the graduation score.

### Propaedeutic subjects and obligatory attendance at lessons:

Students may take exams in any order they wish, except for the restriction, deliberated by the Class Council for academic years 2007-2008 onwards, that access to third year exams is permitted only after students have passed the exams of the foundational subjects of Mathematics, Physics, and General and Inorganic Chemistry. Obligatory attendance is limited to laboratories and teaching excursions.

### Curricula

A new formative organization in effect from the academic year 2007-2008 onwards entails two years of foundational activity in the degree program, followed by a third devoted to one of two concentrations to provide further knowledge in sectors fundamental for the development of topics regarding the reading, analysis, and management of the natural environment.

#### 1- Environmental sustainability and energy resources

This concentration provides foundational knowledge to develop skills in analysis and evaluation of the environment in its various components, to evaluate environmental conditions and to communicate this information for quality management. Particular attention is devoted to the problem of energy in relation to procurement, energy savings, and environmental pollution.

#### 2- Analysis of resources and natural systems

This concentration provides the foundational knowledge necessary to understand, analyze and evaluate naturalistic-environmental problems. Topics addressed are: biocoenosis surveying, thematic cartography, nature conservation, elements of earth sciences, applied ecology, health and the territory.

**TABLE 1: COURSES AND MODULES 1<sup>ST</sup> YEAR**

N	COURSE	total CFU	Modules	CFU for SSD	Typology of the modules and related credits (a,b,c,d,e,f)	Score or pass/fail
1	BIODIVERSITY AND EVOLUTION 1	7	Microbiology (procaryotic)	2 - BIO/19	2 b	score
			Plant biology	5 - BIO/01	5 a	
2	MATHEMATIC AND COMPUTER SCIENCE FOUNDATIONS	13	Mathematical instruments	8 - MAT/06	8 a	score
			Computer statistics	2 - SECS-S/02 3 - INF/01	2 c 3 f	
3	FOUNDATIONS IN LIFE CHEMISTRY I°	7	General and inorganic chemistry	7 - CHIM/03	7 a	score

4	BIODIVERSITY AND EVOLUTION 2°	7	Animal biology (with eucaryotic microbiology)	7 - BIO/05	7 a	score
5	ELEMENTS OF EARTH SCIENCES 1°	13	Fundamental of earth sciences	5 - GEO/03	13 b	score
			Paleontology	3 -GEO/01		
			Mineralogy	5 -GEO/06		
6	FUNDAMENTALS OF PHYSICS	7	Fundamentals of physics	1 - FIS/03 6 - FIS/07	1 a 6 c	score
7	ENGLISH	9	English	9 - L-LIN/12	8 e 1 f	score

**TABLE 1: COURSES AND MODULES 2nd YEAR**

N	COURSE	total CFU	Modules	CFU for SSD	Typology of the modules and related credits (a,b,c,d,e,f)	Score or pass/fail
1	BASES OF LIFE 1°	5	Genetics	4- BIO/18 1-AGR/07	5 b	score
2	BIODIVERSITY AND EVOLUTION 3°	15	Systematic botany	5 - BIO/02	5 b	score
			Animal systematics and phylogenesis (invertebrates)	5 - BIO/05	2 b 3g	
			Evolutionary biology of vertebrates	5 - BIO/06	5 b	
3	CHEMICAL BASES OF LIFE II°	6	Organic chemistry	6 - CHIM/06	6 b	score
4	BASES OF LIFE 2°	10	Biochemistry	3 - BIO/10	3 b	score
			Cellular biology	3 -BIO/06	3 b	
			Physiology	4 -BIO/09	4 b	
5	READING OF THE TERRITORY	9	Physical geography	4 -GEO/04	4 b	score
			Geobotany	5 -BIO/03	5 b	
6	ENVIRONMENTAL PROCEDURES AND LEGISLATION	9	Evaluation of environmental impact and influence	3-BIO/03 3-BIO/07	3 b 3 g	score
			Environmental regulations and legislation	3 -IUS/10	3 c	

**TABLE 1: COURSES AND MODULES 3rd YEAR**  
**CONCENTRATION: ENVIRONMENTAL SUSTAINABILITY AND ENERGY RESOURCES**

N	COURSE	total CFU	Modules	CFU for SSD	Typology of the modules and related credits (a,b,c,d,e,f)	Score or pass/fail
1	FOUNDATIONS OF	7	Ecology	4 -BIO/07	4 g	score

	ECOLOGY		Human ecology	3 -BIO/08	3 b	
2	FUNDAMENTALS OF ENVIRONMENTAL SUSTAINABILITY	5		BIO/07 IUS/10	2g - 3c	score
3	ENERGY RESOURCES AND SYSTEMS	12	Energy acquisition and savings Fossil sources and alternative / renewable sources	6- ING-IND/09 3-GEO/02	9g	score
			Biomass and energy production	3-AGR/03	3g	
4	CHEMISTRY OF THE ENVIRONMENT	5		5 -CHIM/12	5g	score
5	ENVIRONMENTAL ANALYSIS AND MANAGEMENT	12	Applied ecology	3 -BIO/07	3b	score
			Environmental hygiene	5 -MED/42	4c 1g	
			Waste management and recycling	4 -CHIM/01	4g	
6	QUALITY CERTIFICATION AMB, OCCUPATIONAL SAFETY	4		3- MED/42 1-GEO/03	3g 1b	score
7	ELECTIVE	9			d	
8	INTERNSHIP	7			f	
9	FINAL EXAM	2			e	

**TABLE 1: COURSES AND MODULES 3rd YEAR  
 CONCENTRATION: ANALYSIS OF RESOURCES AND NATURAL SYSTEMS**

N	COURSE	total CFU	Modules	CFU for SSD	Typology of the modules and related credits (a,b,c,d,e,f)	Score or pass/fail
1	INTRODUCTION TO ECOLOGY	7	Ecology	4 -BIO/07	2b 2g	score
			Human ecology	3 -BIO/08	3 b	
2	NATURE CONSERVATION	7	Nature conservation	1- BIO/07 3-IUS/10	1b 3c	score
			Applied ecology	3 BIO/07	3g	
3	BIOCOENOSIS SURVEYING	8	Zoocoenoses	4 BIO/05	4g	score
			Plant ecology	4 BIO/03	4g	
4	THEMATIC CARTOGRAPHY	5		2 BIO/03 3 GEO/04	5g	score
5	ELEMENTS OF EARTH SCIENCES 2	7	Environmental geology	4 GEO/04	4b	score
			Pedology	3 AGR/14	3g	
6	HEALTH AND TERRITORY	11	Environmental hygiene	4 MED/42	4c	score
			Parassitology	4 VET/06	4g	
			Applied entomology	3 AGR/11	3g	
7	ELECTIVE	9			d	

8	INTERNSHIP	7			f	
9	FINAL EXAM	2			e	

### Optional formative activities

	CFU
ETHOLOGY	3
NATURALISTIC MUSEUM CURATORSHIP	3
PROTOZOOLOGY	3
BIOLOGY OF REPRODUCTION	3
COMPARATIVE PHYSIOLOGY	3
PHYTOGEOGRAPHY	3
BRYOLOGY	3
BIOLOGY OF PLANT POPULATIONS	3
BIOLOGY APPLIED TO THE ENVIRONMENT	4
NATURALISTIC DIDACTIC LABORATORIES	6

The student can choose electives from the list of courses present in the statute and activated.

### Presentation of individualized curricula

A student enrolled in the Class 27 degree program who has completed at least 60 credits may submit an individualized curriculum and its formative objectives to the Class Council for approval. The deadline for presentation is usually July 30 of the academic year preceding that for the proposed curriculum.

The individualized curriculum contains formative activities proposed by the student in alternative to those stipulated by the standard curricula of the Class.

The Class Council may nominate a special commission to examine the proposed curriculum for conformity to the general criteria and evaluate its suitability for the formative objectives declared.

### English

First year students must take a **Placement Test** organized at the beginning of the first semester. Based on the score, the student will be advised when to begin lessons; those with very good scores may do the oral exam directly during regular exam periods to be assigned the final score for the 9 CFU, without having to attend lessons. First year students who are absolute beginners in English need not do the Placement Test, and should begin attending the first cycle of lessons. Consult <http://web.unicam.it/discite/inglese/straniere.htm> for further information.

### Language certificates

Students who have earned the Cambridge PET or FCE certificates may do the oral exam directly during regular exam periods (bringing the original certificate) without attending lessons or doing the Placement Test, and be assigned the final score for the 9 CFU. They may also contact their Class President to obtain bonus credits of 2 CFU for the PET or 5 CFU for the FCE. Consult <http://web.unicam.it/discite/inglese/straniere.htm> for further information.

### Other languages

Some degree programs award elective credits for exams in French, German and Spanish.

**Enrollment in Professional Registers:** Class 27 graduates who pass the appropriate state boards and serve at least a semester of apprenticeship may enroll in the professional register of Agrotechnicians and Agrotechnicians with degrees, and in the professional register of Junior Biologists (section B).

**Other information**

The didactic regulations for this degree program are available at the academic centers and from the Class President.

The potential offer is for 75 students.

**Transfer from other degree programs**

Presentation of application to the Student Registrar (Segreteria Studenti).

The Class Council will evaluate the curriculum and possibly accept exams the transfer student has already passed, assigning CFU to them. Detailed information is available from the Registrar.

**Further study for which this degree program prepares students:**

Masters, Specialization Schools, Two-year post-degree programs (lauree specialistiche).

**Degree program contents (programmi)**

Degree program contents and the names of the professors responsible for each course can be viewed and downloaded from the UNICAM site.

**Second level degree (cl. 82/M)**

Graduates in Sciences for Nature and the Environment may enroll in the **second level degree in Management of the Natural Environment and Protected Areas**, based in Camerino, with full recognition of the credits acquired with the degree in Sciences for Nature and the Environment. Students with different degrees and/or from other universities may enroll in the second level degree in Management of the Natural Environment and Protected Areas once their curriculum has been evaluated for confirmation of their credits and identification of possible formative debts (no more than 40 CFU to be completed during the first year).

The graduate with this second level degree must possess:

- more in-depth foundational systemic knowledge regarding the environment and its biotic and abiotic components;
- theoretical and methodological foundations in naturalistic disciplines, applied to the study, monitoring, evaluation and management of the territory, of complex realities and natural resources, management of protected areas, ecological planning of the territory; the ability to utilize criteria of sustainability, prevention, ecologic ethics and functionality;
- the ability to work autonomously, to take responsibility for programs, projects, territorial plans and structures;
- technical and juridical knowledge necessary for job performance.

**Occupations:** Graduates in Management of the natural environment and protected areas will be able to program, plan, implement, direct, coordinate, validate, inspect, and conduct activities of:

- census-taking, analysis, cartographic-thematic expression of the naturalistic patrimony and natural resources;
- inspection, evaluation and monitoring of the environment and natural resources;
- restoration and management of the natural environment;
- organization, management and direction of protected areas, scientific centers and museums, botanical gardens, centers for naturalistic and environmental education;

- planning and management of naturalistic itineraries and specialistic informational programs;
- environmental and territorial planning, with particular reference to protected areas;
- promotion and coordination of environmental policy and orientation programs (for example, working as Environmental Authority).

On the basis of article 1, c. 18 L. 4/99, the 82M second level degree grants admission to the state boards for enrollment in section "A" of the following professional registers: Biologist, Agronomical and Forest Degree holder, Landscape architect, Geologist.

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