



DIDACTIC REGULATIONS OF THE DEGREE PROGRAM

SCIENCES FOR THE NATURE AND ENVIRONMENT

CLASS L-32

School: polytechnic and basic sciences degree in English

Department: Biology

Regulations in force since the academic year 2024-2025

ACRONYMS

CCD	[Commissione di Coordinamento Didattico]	Didactic Coordination Commission
CdS	[Corso/i di Studio]	Degree Program
CPDS	[Commissione Paritetica Docenti-Studenti]	Joint Teachers-Students Committee
OFA	[Obblighi Formativi Aggiuntivi]	Additional Training Obligations
SUA-CdS	[Scheda Unica Annuale del Corso di Studio]	Annual single form of the Degree Program
RDA	[Regolamento Didattico di Ateneo]	University Didactic Regulations

INDEX

Art. 1	Object
Art. 2	Training objectives
Art. 3	Professional profile and work opportunities
Art. 4	Admission requirements and knowledge required for access to the Degree Program
Art. 5	Procedures for access to the Degree Program
Art. 6	Teaching activities and Credits
Art. 7	Description of teaching methods
Art. 8	Testing of training activities
Art. 9	Degree Program structure and Study Plan
Art. 10	Attendance requirements
Art. 11	Prerequisites and prior knowledge
Art. 12	Degree Program calendar
Art. 13	Criteria for the recognition of credits earned in other Degree Programs in the same Class.
Art. 14	Criteria for the recognition of credits acquired in Degree Programs of different Classes, in university and university-level Degree Programs, through single courses, at online Universities and in International Degree Programs; criteria for the recognition of credits acquired through extra-curricular activities.
Art. 15	Criteria for enrolment in individual teaching courses
Art. 16	Features and arrangements for the final examination
Art. 17	Guidelines for traineeship and internship
Art. 18	Disqualification of student status
Art. 19	Teaching tasks, including supplementary teaching, guidance, and tutoring activities
Art. 20	Evaluation of the quality of the activities performed
Art. 21	Final rules
Art. 22	Publicity and entry into force

Art. 1 Object

1. This Didactic Regulations govern the organisational aspects of the degree course in “Sciences for the Nature and Environment” (class L-32 – Sciences and Technology for Nature and Environment). The degree course in in Sciences for the Nature and Environment is hinged in University of Naples Federico II, Department of Biology.
2. **Degree course name in Italian:** Scienze per la Natura e per l'Ambiente
Degree course name in English: Sciences for the Nature and Environment
Class: L-32
Teaching language: Italian
3. The Degree course is governed by the Didactic Coordination Commission (CCD), pursuant to Art. 4 of the RDA.
Framework: Contact Person and Structure
Collegial Management Body of the Degree course: Didactic Coordination Commission
QA Management Group (Review Group)
4. The Didactic Regulations is issued in compliance with the relevant legislation in force, the Statute of the University of Naples Federico II, and the RDA.

Art. 2 Training objectives

The Degree in Nature and Environmental Sciences aims to train graduates with an interdisciplinary and systemic preparation in the field of Natural Sciences, capable of reading the environment at multiple levels in its biotic and abiotic components and their interactions and of knowing how to govern the transformation processes induced by man and to:

- be able to effectively use, in written and oral form, at least one European Union language, in addition to Italian in the specific field of competence and for the exchange of general information;
- possess adequate skills and tools for communication and information management;
- be able to work in a team, to operate with defined degrees of autonomy and to fit readily into work environments;
- possess the basic cognitive tools for continuously updating one's knowledge.

The synthesis between the biological disciplines, those of Earth Sciences and those of mathematics, chemistry, and physics, together with the distinct and systematic multi- and interdisciplinary approach provided to environmental systems, favors a global vision and, therefore, an increased capacity for analysis and understanding phenomena that characterize the natural environment. This educational balance aims to highlight the correlations between organisms, at the level of individuals, populations and communities, and the terrestrial substrate which give rise to current ecosystems. The understanding and acquisition of methodological knowledge, and their practical application through laboratory and field activities, will allow the naturalist technician to understand and evaluate the role of individual organisms and their communities in ecosystems, the structure and role of these communities, the value of ecosystems and territories in terms of biodiversity, with conservationist implications, and the dynamic processes through which ecosystems function. The naturalist technician will be able to understand the present and interpret the past to be able to provide a significant contribution to the creation of predictive models for sustainable future management of resources in natural systems.

The Degree course also develops the scientific and methodological foundations for the achievement by members of teaching tools with a specific identity for each level of pre-university school. This degree is characterized by a high level of interdisciplinary knowledge of nature and a series of analytical skills and abilities, combined with the development of observation skills, local practice and internships in the world of work.

The three-year training course is oriented towards Natural Sciences and is therefore characterized by teaching activities relating to the sectors of biological sciences and Earth sciences; its focus is therefore aimed at analysis and management, starting from populations of single species or single communities of organisms up to complex environmental realities, thus providing for the interaction between a wide spectrum of basic, methodological and process disciplines, with fundamental elements of relevant legal disciplines;

- includes, among the training activities in the various disciplinary sectors, lessons and laboratory exercises and field activities, in particular dedicated to the knowledge of experimental methods and data processing;

- may provide, in relation to specific objectives, the obligation of external activities, such as training internships in companies, public administration structures and laboratories, as well as stays at other Italian and European universities, also in the framework of international agreements.

The time reserved for personal study or other individual training activities is more than 60% of the total time commitment for frontal teaching activities and is 50% for training activities with a high experimental and practical content. The degree course differs from other proposals relating to the same class offered by other universities in the

region (in particular, University of Salerno - c.d.l. in Environmental Evaluation and Control - and University of Campania L. Vanvitelli - c.d.l. in Environmental Sciences), since, if in the latter there is greater attention to the control of pollution and/or the chemistry of the environment, in the c.d.l. covered here there is greater attention to aspects pertinent to current and extinct organisms, with possible taxonomic and museum implications and to the interaction between communities of organisms and their territory, with implications for the management of natural and semi-natural territories.

Art. 3

Professional profile and work opportunities

PROFESSIONAL PROFILE: Expert in natural and environmental sciences

Function in a work context

The function of the naturalist technician is configured in the ability to collaborate in: environmental analysis laboratories, management of Natural Reserves and Parks, Auditing for the evaluation of quality and environmental certification, environmental guide activities, collaborator activities in Natural History Museums, at the Superintendence for architectural heritage and landscape, in the Botanical Gardens and in zoos and aquariums.

Skills associated with the function

For this profession the following are necessary and provided by the Study Course:

- a systemic culture of the environment and a good practice of the scientific method for the analysis of components and factors of processes, systems and problems concerning the environment, both natural and modified by human beings;
- the ability to effectively use, in written and oral form, at least one European Union language, in addition to Italian, in the specific field of competence and for the exchange of general information;
- adequate knowledge of skills and tools for communication and information management;

- the ability to work in a team, to operate with defined degrees of autonomy and to fit promptly into work environments;
- the basic cognitive tools for continuously updating one's knowledge.

Employment opportunities

The elective fields of employment of the naturalist technician are located in different areas such as:

- bodies responsible for the planning and management of natural resources (Ministry for Agricultural Policies, Ministry of the Environment, regional, provincial and municipal departments of the same name, Provincial Departments for Hunting and Fishing, Regional Forestry Companies, Mountain Communities, etc.);
- naturalistic and cultural heritage management bodies (National and Regional Parks, Nature Reserves, Protected Areas, Oases, Superintendencies for architectural and landscape heritage and for the historical, artistic and ethno-anthropological heritage and related structures, etc.), public structures socio-healthcare (territorial technical services, ASL, zooprophyllactic institutes, etc.), public and private biomonitoring structures (ARPA, APAT, laboratories for environmental quality control, etc.);
- private professional firms engaged in research relating to the analysis and evaluation of natural resources, the evaluation of environmental impact, in the development of territorial planning tools, for the preparation of multimedia systems for environmental communication and information;
- in the field of scientific research, the naturalist technician can have access to university and CNR laboratories and, with technical tasks, to Natural History Museums, to the Superintendence for architectural and landscape heritage and for the historical and artistic heritage ethnoanthropological, to the Botanical Gardens and Herbariums;
- in the field of training and scientific dissemination.

Art. 4

Admission requirements and knowledge required for access to the Degree Program¹

The knowledge required for the Degree Course in Nature and Environmental Sciences is the basic principles of Mathematical, Physical and Natural Sciences, as defined by the ministerial programs relating to secondary schools of all levels and in particular:

- 1) basic knowledge of Mathematics, including the foundations of algebraic and arithmetic calculation, trigonometry, analytical geometry, elementary functions and logarithms;
- 2) basic knowledge of classical physics, with reference to the foundations of mechanics, optics and electromagnetism;
- 3) basic knowledge of Chemistry, with reference to the foundations of the structure and properties of matter and its states of aggregation, and the periodic properties of the elements;
- 4) basic knowledge of the biology of living things with reference to animals and plants, the general principles of the classification and evolution of organisms and their interactions in the Biosphere;
- 5) basic knowledge of Earth Sciences with reference to Geography and Geology;
- 6) basic knowledge and use of the main widely used computer programs;
- 7) elementary knowledge of the English language relating to the principles of translation and understanding of simple written texts;
- 8) Upper secondary school diploma or other qualification obtained abroad and recognized as suitable as required by Ministerial Decree 270/04, art. 6, paragraph 1.

Enrolling students will have to take an assessment test electronically, the outcome of which is not binding for the purposes of enrolment. The methods for carrying out the test are specified in the

¹ Artt. 7, 13, 14 of the University Didactic Regulations.

teaching regulations of the degree course. The verification of the knowledge required for access will be carried out according to the methods indicated in the teaching regulations of the course of study. Any additional training obligations will be provided for, in the event that the verification of the knowledge required for access is not positive, by the regulations of the Course of Studies. For example, as stated below, the CCS will organize, within the activities of the Polytechnic School and Basic Sciences, training activities supplementary courses (OFA - Additional Educational Obligations) aimed at filling any gaps in basic scientific knowledge which constitute an essential requirement for access to the Degree Course.

Art. 5

Procedures for access to the Degree Program

1. The CCD of the Degree Program normally regulates the admission criteria and any scheduling of enrolments, except in the case subject to different provisions of law².
2. In the event of negative assessment of the adequate initial preparation regarding knowledge requirements for admission to the Degree Program, the CCD assigns specific Additional Formative Obligations (OFA), indicating the means of verification to be fulfilled within the first year of the Program.

To access the Course of Study it is necessary to take an online self-assessment test (N-Quiz), which is mandatory but not selective. The entry requirements are established by the Teaching Coordination Commission. The test was developed by the commission established by the CCD on 28 May 2020 and includes 50 questions administered on an online platform. The test includes multiple choice questions on topics of Mathematics, Physics, Earth Sciences and Life Sciences. The test will be delivered in multiple sessions in the July-October period, extendable if necessary. More information on the test can be found on the degree course web page. N-Quiz verifies the essential initial knowledge and provides indications to the CCD regarding tutoring initiatives and provision of the training course.

Art. 6

Teaching activities and university training credit (Teaching activities and CFU)

Each training activity, prescribed by the Degree course detail sheet, is measured in CFU. Each CFU corresponds to 25 hours of overall training commitment³ per student and includes the hours of teaching activities specified in the curriculum as well as the hours reserved for personal study or other individual training activities.

For the Degree Program covered by this Didactic Regulations, the hours of teaching specified in the curriculum for each CFU, established in relation to the type of training activity, are as follows⁴:

- Lecture or guided teaching exercises: 8 hours per CFU;

² National programmed access is regulated by L. 264/1999 and subsequent amendments and supplements.

³ According to Art. 5, c. 1 of Italian Ministerial Decree No 270/2004, "25 hours of total commitment per student correspond to university training credits; a ministerial decree may justifiably determine variations above or below the aforementioned hours for individual classes, by a limit of 20 per cent".

⁴ The number of hours considers the instructions in Art. 6, c. 5 of the RDA: "of the total 25 hours, for each CFU, are reserved: a) 5 to 10 hours for lectures or guided teaching exercises; b) 5 to 10 hours for seminars; c) 8 to 12 hours for laboratory activities or fieldwork, except in the case of training activities with a high experimental or practical content, and subject to different legal provisions or different determinations by DD.MM."

- Seminar: 5 hours per CFU;
- Laboratory activities or fieldwork: 12 hours per CFU;

For Internship and Thesis activities, each credit corresponds to 25 hours of overall training commitment⁵.

The CFU corresponding to each training activity acquired by the student is awarded by satisfying the assessment procedures (examination, pass mark) indicated in the Course sheet relating to the course/activity attached to this Didactic Regulations.

Art. 7

Description of teaching methods

The didactic activity is carried out in accordance with the provisions of a conventional study course.

If necessary, the CCD decides which courses also include teaching activities offered online, according to Ministerial Decree 289 of 25 March 2021 (general guidelines for the three-year planning of universities 2021-2023), in Annex 4, letter A.

Some courses may also take place in seminar form and/or involve classroom exercises, language, and computer laboratories.

Detailed information on how each course is conducted can be found in the course sheets.

Art. 8

Testing of training activities⁶

1. The CCD, within the prescribed regulatory limits⁷, establishes the number of examinations and other means of assessment that determine the acquisition of credits. Examinations are individual and may consist of written, oral, practical, graphical tests, term papers, interviews, or a combination of these modes.
2. The examination procedures published in the course sheets and the examination schedule will be made known to students before the start of classes on the Department's website.⁸
3. Examinations are held subject to booking, which is made electronically. In case the student is unable to book an exam for reasons that the President of the Board considers justifiable, the student may still be admitted to the examination, following those students already booked.

⁵ For Internship activities (Inter-ministerial Decree 142/1998), subject to further specific provisions, the number of working hours equal to 1 CFU may not be less than 25. [please indicate below in the note any different regulatory provisions, e.g., "LM-13: 1 CFU = 30 hours, Note MUR, Director Cuomo, Prot. 570/2011; LM-51, L-24: 1 CFU = 20 hours professional training activity + 5 hours of further supervised training activity, D.M. 654/2022 (Art. 2, practical-assessment Internship)"]

⁶ Article 22 of the University Didactic Regulations.

⁷ Pursuant to the DD.MM. 16.3.2007 in each Degree Programs the examinations or profit tests envisaged may not be more than 20 (Bachelor's Degrees; Art. 4. c. 2), 12 (Master's Degrees; Art. 4, c. 2), 30 (five-year single-cycle Degrees) or 36 (six-year single-cycle Degrees; Art. 4, c. 3). Pursuant to the RDA, Art. 13, c. 4, "the assessments that constitute an eligibility evaluation for activities referred to in Art. 10, c. 5, letters c), d), and e) of Ministerial Decree no. 270/2004, including the final examination for obtaining the degree, are excluded from the calculation." For Master's Degree Program and single-cycle Master's Degree Program, however, pursuant to the RDA, Art. 14, c. 7, "the assessments that constitute a progress evaluation for activities referred to in Art.10, c. 5, letters d) and e) of Ministerial Decree no. 270/2004 are excluded from the exam count; the final examination for obtaining the Master's Degree and single-cycle Master's Degree is included in the maximum number of exams".

⁸ Reference is made to Art. 22, c. 8, of the University Teaching Regulations, which states that "the Department or School ensures that the dates for progress assessments are published on the portal with reasonable advance notice, which normally cannot be less than 60 days before the start of each academic period, and that an adequate period of time is provided for exam registration, which is generally mandatory."

4. Before examination, the President of the Board of Examiners verifies the identity of the student, who must present a valid photo ID.
5. Examinations are marked out of 30. Examinations involving an assessment out of 30 shall be passed with a minimum mark of 18; a mark of 30 may be accompanied by honours by unanimous vote of the Board. Examinations are marked out of 30 or with a simple pass mark. Assessment following tests other than examinations are marked out with a simple pass mark.
6. Oral exams are open to the public. If written tests are scheduled, the candidate has the right to see his/her paper(s) after correction.
7. Examination Boards are governed by the University Didactic Regulations⁹.

Art. 9

Degree Program structure and Study Plan

1. The legal duration of the Degree Program is 3 years. The student must acquire 180 CFU¹⁰, attributable to the following Types of Training Activities (TAF):
 - A) basic,
 - B) characterising,
 - C) related or complementary,
 - D) at the student's choice¹¹,
 - E) for the final exam,
 - F) further training activities.
2. The degree is awarded after having acquired 180 CFU by passing examinations, not exceeding 20, and the performance of other training activities.
 Unless otherwise provided for in the legal framework of University studies, examinations taken as part of basic, characterising, and related or supplementary activities, as well as activities chosen autonomously by the student (TAF D) are taken into consideration for counting purposes. Examinations or assessments relating to activities independently chosen by the student may be considered in the overall calculation corresponding to one unit¹². Tests constituting an assessment of suitability for the activities referred to in Article 10, paragraph 5, letters c), d) and e) of Ministerial Decree 270/2004¹³ are excluded from the count. Integrated Courses comprising of two or more modules are subject to a single examination.

⁹ Reference is made to Art. 22, paragraph 4 of the RDA according to which "Examination Boards and other assessments committees are appointed by the Director of the Department or by the President of the School when provided for in the School's Regulations. This function may be delegated to the CCD Coordinator. The Commissions comprise of the President and, if necessary, other professors or experts in the subject. In the case of active courses, the President is the course instructor, and in such cases, the Board can validly make decisions even in the presence of the President alone. In other cases, the President is a professor identified at the time of the Board's appointment. In the comprehensive evaluation of the overall performance at the conclusion of an integrated course, the professors in charge of the coordinated modules participate, and the President is appointed when the Commission is appointed."

¹⁰ The total number of CFU for the acquisition of the relevant degree must be understood as follows: six-year single-cycle Degree, 360 CFU; five-year single-cycle Degree, 300 CFU; Bachelor's Degree, 180 CFU; Master's Degree, 120 CFU.

¹¹ Corresponding to at least 12 ECTS for Bachelor's Degrees and at least 8 CFU for Master's Degrees (Art. 4, c. 3 of Ministerial Decree 16.3.2007).

¹² Pursuant to the D.M. 386/2007.

¹³ Art. 10, c. 5 of Ministerial Decree. 270/2004: "In addition to the qualifying training activities, as provided for in paragraphs 1, 2 and 3, Degree Programs shall provide for: a) training activities autonomously chosen by the student as long as they are consistent with the training project [TAF D]; b) training activities in one or more disciplinary fields related or complementary to the basic and characterising ones, also with regard to context cultures and interdisciplinary training [TAF C]; c) training activities related to the preparation of the final exam for the achievement of the degree and, with reference to the degree, to the verification of the knowledge of at least one foreign language in addition to Italian [TAF E]; d) training activities, not envisaged in the previous points, aimed at acquiring additional language knowledge,

3. To acquire the CFU relating to independent choice activities, the student is free to choose among all the Course offered by the University, provided that they are consistent with the training project. This consistency is assessed by the Didactic Coordination Commission. Also, for the acquisition of the CFU relating to autonomous choice activities the "passing the exam or other form of profit verification" is required (Art. 5, c. 4 of Ministerial Decree 270/2004).
4. The student may also include in the choice credits any internship credits in excess of those provided for in the regulations, subject to approval by the CCD.
5. Choice credits may also be taken in years other than the one foreseen, if they do not exceed, in total, those required for the entire degree course.
6. The study plan summarises the structure of the Degree Program, listing the envisaged teachings broken down by course year and, in case, by curriculum. At the end, the propedeuticities envisaged by the Degree Program are listed. The study plan offered to students, with an indication of the scientific-disciplinary sectors and the area to which they belong, of the credits, of the type of educational activity, is set out in Annex 1 to this Didactic Regulations.
7. Pursuant to the Art. 11, paragraph 4-bis, of Ministerial Decree 270/2004, it is possible to obtain the Degree according to an individual study plan that also includes educational activities different from those specified in the Didactic Regulations, if they are consistent with Degree course detail sheet of the academic year of enrollment. The individual study plan is approved by CCD.

Art. 10

Attendance requirements¹⁴

1. In general, attendance of lectures is strongly recommended but not compulsory
In the case of individual courses with compulsory attendance, this option is indicated in the relative teaching/activity course sheet available in Annex 2.1.
2. If the lecturer envisages a different syllabus modulation for attending and non-attending students, this is indicated in the individual Course detail published on the Degree course web page and on the teacher's UniNA website.
3. Attendance at seminar activities that award training credits is compulsory. The relative modalities for the attribution of CFU are the responsibility of the CCD.

Art. 11

Prerequisites and prior knowledge

1. The list of incoming and outgoing propedeuticities (necessary to sit a particular examination) can be found at the end of Annex 1.1 and in the teaching/activity course sheet (Annex 2.1).
2. Any prior knowledge deemed necessary is indicated in the individual Teaching Schedule published on the course webpage and on the teacher's UniNA website.
3. The preparatory exams for each course are defined in Annex 2.1; Furthermore, the courses of "General and inorganic chemistry with laboratory", "Organic chemistry with laboratory", "Institutions of Mathematics", "Physics with laboratory" are preparatory for the third-year exams.

as well as computer and telematic skills, relational skills, or in any case useful for integration in the world of work, as well as training activities aimed at facilitating professional choices, through direct knowledge of the job sector to which the qualification may give access, including, in particular, training and guidance programs referred to in Decree no. 142 of 25 March 1998 of the Ministry of Labour [TAF F]; e) in the hypothesis referred to in Article 3, paragraph 5, training activities relating to internships and apprenticeships with companies, public administrations, public or private entities including those of the third sector, professional orders and colleges, on the basis of appropriate agreements".

¹⁴ Art. 22, c. 10 of the University Didactic Regulations.

Art. 12

Degree Program Calendar

The Degree Program calendar can be found on the Department's website well in advance of the start of the activities (Art. 21, c. 5 of the RDA).

Art. 13

Criteria for the recognition of credits earned in other Degree Programs in the same Class¹⁵

For students coming from Degree Programs of the same class, the Didactic Coordination Commission ensures the full recognition of CFU, when associated with activities that are culturally compatible with the training Degree Program, acquired by the student at the originating Degree Program, according to the criteria outlined in Article 14 below. Failure to recognise credits must be adequately justified. This is without prejudice to the fact that the number of credits relating to the same scientific-disciplinary sector directly recognised by the student may not be less than 50% of those previously achieved. If the course of origin is carried out in distance mode, the minimum quota of 50% is recognized only if the course of origin is accredited pursuant to the ministerial regulation referred to in article 2, paragraph 148, of the legislative decree 3 October 2006, n. 262, converted by law 24 November 2006, n. 286.

Article 14

Criteria for the recognition of credits acquired in Degree Programs of different classes, in university or university-level Degree Programs, through single courses, at online Universities and in international Degree Programs¹⁶; criteria for the recognition of credits acquired in extra-curricular activities.

1. With regard to the criteria for the recognition of CFU acquired in Degree Programs of different Classes, in university or university-level Degree Programs, through single courses, at online Universities and in International Degree Programs, the credits acquired are recognised by the CCD on the basis of the following criteria:

- analysis of the activities carried out;
- evaluation of the congruity of the disciplinary scientific sectors and of the contents of the training activities in which the student has earned credits with the specific training objectives of the Degree Program and of the individual training activities to be recognised.

Recognition is carried out up to the number of credits envisaged by the didactic system of the Degree Program. Failure to recognise credits must be adequately justified. Pursuant to the Art. 5, c. 5-bis, of Ministerial Decree 270/2004, the acquisition of CFU from other Italian universities is also possible, based on agreements established between the concerned institutions in accordance with the current regulations¹⁷.

¹⁵ Art. 19 of the University Didactic Regulations.

¹⁶ Art. 19 of the University Didactic Regulations.

¹⁷ Art. 6, c. 9 of the University Didactic Regulations.

2. Any recognition of CFU relating to examinations passed as single courses may take place within the limit of 36 CFU, upon request of the interested party and following the approval of the CCD. Recognition may not contribute to the reduction of the legal duration of the Degree Program, as determined by Art. 8, c. 2 of Ministerial Decree 270/2004, except for students who enrol while already in possession of a degree of the same level¹⁸.
6. Regarding the criteria for the recognition of CFU acquired in extra-curricular activities, within the limit of 12 CFU the following activities may be recognised:
 - Professional knowledges, skills, and certified skills, considering the congruence of the activity carried out and/or of the certified skill with the aims and objectives of the Degree Program as well as the hourly commitment of the duration of the activity.
 - Knowledges and skills acquired in post-secondary-level training activities, which the University contributed to develop and implement.

Art. 15

Criteria for enrolment in individual teaching courses

Enrolment in individual teaching courses, provided for by the University Didactic Regulations¹⁹, is governed by the "University Regulations for enrolment in individual teaching courses activated as part of the Degree Program"²⁰.

¹⁸ R.D. No. 3241/2019.

¹⁹ Art. 19, c. 4 of the University Didactic Regulations.

²⁰ R.D. No. 3241/2019.

Article 16

Features and modalities for the final examination

Characteristics of the final exam

The degree in Nature and Environmental Sciences is achieved after passing a final test, consisting of the discussion of a written report, drawn up by the student under the guidance of a supervisor, concerning the activities carried out in a research laboratory possibly including internship activities also carried out in private structures, as well as all data acquisition activities and bibliographic information relating to the project.

Procedure for carrying out the final exam

The degree in Nature and Environmental Sciences is achieved after passing a final test consisting of the discussion of a written report, prepared by the student under the guidance of a supervisor, concerning the activities carried out in an experimental, bibliographical or resulting from the processing of a set of data provided by the rapporteur.

The activities can also be carried out in external public or private structures but followed by a supervisor within the degree course.

The Degree Committee will meet according to a schedule that will be published on the Biology Department website. The candidates will be announced in public session.

The final mark awarded to the student is obtained by taking into account the student's career, the final report submitted and the presentation of the paper to the committee. The jury for the final examination shall award the mark in 100ths. By unanimous decision, the committee may award honours to the candidate obtaining the highest mark.

Article 17

Guidelines for traineeship and internship

1. Students enrolled in the Degree Program may decide to carry out internships or training periods with organisations or companies that have an agreement with the University. Traineeship and internship are not compulsory and contribute to the award of credits for the other training activities chosen by the student and included in the study plan, as provided for by Art. 10, par. 5, letters d and e, of Ministerial Decree 270/2004²¹.
2. The modalities and characteristics of traineeship and internship are regulated by the CCD with a specific regulation.
3. The University of Naples Federico II, through the Student Internship Office (<http://www.unina.it/didattica/tirocini-studenti>), the Incoming and Outgoing Orientation Office, placement and outreach which ensure constant contact with the world of work, in order to offer students and graduates of the University concrete opportunities for internships and work experience and to promote their professional integration.

Article 18

Disqualification of student status²²

A student who has not taken any examinations for eight consecutive academic years incurs forfeiture unless his/her contract stipulates otherwise. In any case, forfeiture shall be notified to the student by certified e-mail or other suitable means attesting to its receipt.

²¹ Traineeships ex letter d can be both internal and external; traineeships ex letter e can only be external.

²² Art. 24, c. 5 of the University Didactic Regulations.

Article 19

Teaching tasks, including supplementary teaching, guidance, and tutoring activities

1. Professors and researchers carry out the teaching load assigned to them in accordance with the provisions of the RDA and the Regulations on the teaching and student service duties of professors and researchers and on the procedures for self-certification and verification of actual performance²³.
2. Professors and researchers must guarantee at least two hours of reception every 15 days (or by appointment in any case granted no longer than 15 days) and in any case guarantee availability by e-mail.
3. The tutoring service has the task of orienting and assisting students throughout their studies and of removing the obstacles that prevent them from adequately benefiting from attending courses, also through initiatives tailored to the needs and aptitudes of individuals.
4. The University ensures guidance, tutoring and assistance services and activities to welcome and support students. These activities are organised by the Schools and/or Departments under the coordination of the University, as established by the RDA in Article 8.

Article 20

Evaluation of the quality of the activities performed

1. The Didactic Coordination Commission implements all the forms of quality assessment of teaching activities envisaged by the regulations in force according to the indications provided by the University Quality Presidium.
2. In order to guarantee the quality of teaching to the students and to identify the needs of the students and all stakeholders, the University of Naples Federico II uses the Quality Assurance (QA)²⁴ System, developed in accordance with the document "Self-evaluation, Evaluation and Accreditation of the Italian University System" of ANVUR, using:
 - surveys on the degree of placement of graduates into the world of work and on post-graduate needs;
 - data extracted from the administration of the questionnaire to assess student satisfaction for each course in the curriculum, with questions relating to the way the course is conducted, teaching materials, teaching aids, organisation, facilities.

The requirements deriving from the analysis of student satisfaction data, discussed, and analysed by the Teaching Coordination Committee and the Joint Teachers' and Students' Committee (CPDS), are included among the input data in the service design process and/or among the quality objectives.

3. The QA System developed by the University implements a process of continuous improvement of the objectives and of the appropriate tools to achieve them, ensuring that planning, monitoring, and self-assessment processes are activated in all the structures to allow the prompt detection of problems, their adequate investigation, and the design of possible solutions.

Article 21

Final Rules

²³ R.D No. 2482//2020.

²⁴ The Quality Assurance System, based on a process approach and adequately documented, is designed in such a way as to identify the needs of the students and all stakeholders, and then translate them into requirements that the training offer must meet.

The Department Council, on the proposal of the CCD, submits any proposals to amend and/or supplement these Rules for consideration by the Academic Senate.

Article 22

Publicity and Entry into Force

1. These Rules and Regulations shall enter into force on the day following their publication on the University's official notice board; they shall also be published on the University website. The same forms and methods of publicity shall be used for subsequent amendments and additions.
2. Annex 1 (degree course structure) and Annex 2 (Teaching/Activity course sheet) are an integral part of this Didactic Regulations.



ANNEX 1.1

DEGREE PROGRAM DIDACTIC REGULATIONS SCIENCES FOR THE NATURE AND ENVIRONMENT CLASS L-32

School: Polytechnic and Basic Sciences

Department: Biology

Didactic Regulations in force since the academic year 2024-2025

STUDY PLAN

KEY

Type of Educational Activity (TAF):

A = Basic

B = Characterising

C = Related or Supplementary

D = At the student's choice

E = Final examination and language knowledge

F = Further training activities

Year I									
Common pathway to both curricula (Biodiversity monitoring and Environmental Hiking Guides)									
Title Course	SSD	Module	Credits	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Mathematics Institutions	MAT/01-09	single	9	72	Frontal lesson	In-person	A	Mathematical, computer science and statistical disciplines	Mandatory
General and Inorganic Chemistry with laboratory	CHIM/03	single	8	68	Frontal lesson and laboratory	In-person	A	Chemical disciplines	Mandatory
Physics with laboratory	FIS/01-07	single	8	68	Frontal lesson and laboratory	In-person	A	Physical disciplines	Mandatory
General Biology with Laboratory	BIO/06	single	9	76	Frontal lesson and laboratory	In-person	C	Related or supplementary	Mandatory

General Botany with laboratory	BIO/01	single	9	76	Frontal lesson and laboratory	In-person	A	Naturalistic Disciplines	Mandatory
General Zoology with laboratory	BIO/05	single	9	76	Frontal lesson and laboratory	In-person	A	Naturalistic Disciplines	Mandatory
Language laboratory (English 1)	LIN/12	single	4	32	Frontal lesson	In-person/by distance	E	Linguistic knowledge	Mandatory

Year II

Curriculum Biodiversity monitoring

Title course	SSD	Module	Credits	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Mineralogy with laboratory	GEO/06	single	9	76	Frontal lesson and laboratory	In-person	B	Earth Sciences Disciplines	Mandatory
Physical Geography with laboratory	GEO/04	single	9	76	Frontal lesson and laboratory	In-person	B	Ecological Disciplines	Mandatory
Systematic Botany with laboratory	BIO/02	single	9	76	Frontal lesson and laboratory	In-person	B	Biological Disciplines	Mandatory
Systematic Zoology with laboratory	BIO/05	single	9	76	Frontal lesson and laboratory	In-person	B	Biological Disciplines	Mandatory
Geology with laboratory	GEO/02	single	9	76	Frontal lesson and laboratory	In-person	B	Earth Sciences Disciplines	Mandatory
Organic chemistry with laboratory	CHIM/06	single	6	52	Frontal lesson and laboratory	In-person	A	Chemical Disciplines	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person/by distance	D	At the student's choice	Mandatory
Further Training Activities		single	6	150	Laboratory	In-person/by distance	F	Other useful knowledge for entering the world of work	Mandatory

Year III

Curriculum Biodiversity monitoring

Title course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Ecology with laboratory	BIO/07	single	9	76	Frontal lesson and laboratory	In-person	B	Ecological Disciplines	Mandatory
Lithology with laboratory	GEO/07	single	9	76	Frontal lesson and laboratory	In-person	B	Earth Sciences Disciplines	Mandatory

Paleontology with laboratory	GEO/01	single	9	76	Frontal lesson and laboratory	In-person	C	Earth Sciences Disciplines	Mandatory
Animal physiology with laboratory	BIO/09	single	9	76	Frontal lesson and laboratory	In-person	B	Biological Disciplines	Mandatory
Hygiene and environmental protection	MED/42	single	6	48	Frontal lesson	In-person	B	Agricultural, chemical, physical, legal, economic and contextual Disciplines	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person/by distance	D	At the student's choice	Mandatory
Further training activities		single	9	225	Laboratory	In-person/by distance	F	Other useful knowledge for entering the world of work	Mandatory
Final test		single	4	100			E	For the final test	Mandatory

Year II

Curriculum Environmental Hiking Guides

Title course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Rocks and their constituents with laboratory	GEO/07	single	6	52	Frontal lesson and laboratory	In-person	B	Earth Sciences Disciplines	Mandatory
Physical Geography with laboratory	GEO/04	single	9	76	Frontal lesson and laboratory	In-person	C	Related or supplementary	Mandatory
Systematic Botany with laboratory	BIO/02	single	9	76	Frontal lesson and laboratory	In-person	B	Biological Disciplines	Mandatory
Digital cartography and territorial information systems	GEO/04	single	6	48	Frontal lesson	In-person	B	Ecological Disciplines	Mandatory
Systematic Zoology with laboratory	BIO/05	single	9	76	Frontal lesson and laboratory	In-person	B	Biological Disciplines	Mandatory
Geology with laboratory	GEO/02	single	9	76	Frontal lesson and laboratory	In-person	B	Earth Sciences Disciplines	Mandatory
Organic chemistry with laboratory	CHIM/06	single	6	52	Frontal lesson and laboratory	In-person	A	Chemical Disciplines	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person/by distance	D	At the student's choice	Mandatory
Further Training Activities		single	6	150	Laboratory	In-person/by distance	F	Other useful knowledge for entering	Mandatory

								the world of work	
Year III									
Curriculum Environmental Hiking Guides									
Title course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Ecology with laboratory	BIO/07	single	9	76	Frontal lesson and laboratory	In-person	B	Ecological Disciplines	Mandatory
Flora and fauna of the Mediterranean	BIO/02	Recognition of Flora in the Field	6	48	Frontal lesson	In-person	B	Biological Disciplines	Mandatory
	BIO/05	Identification of fauna in the field	6	48	Frontal lesson	In-person	A	Naturalistic Disciplines	Mandatory
Paleontology with laboratory	GEO/01	single	9	76	Frontal lesson and laboratory	In-person	C	Earth Sciences Disciplines	Mandatory
Volcanology and excursions in volcanic areas	GEO/08	single	6	48	Frontal lesson	In-person	B	Earth Sciences disciplines	Mandatory
Hygiene and environmental protection	MED/42	single	6	48	Frontal lesson	In-person	B	Agricultural, chemical, physical, legal, economic and contextual Disciplines	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person/by distance	D	At the student's choice	Mandatory
Further training activities		single	6	150	Laboratory	In-person/by distance	F	Other useful knowledge for entering the world of work	Mandatory
Final test		single	4	100			E	For the final test	Mandatory

At the student's choice courses						
Title course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops etc.)	Course Modalities (in-person, by distance)
Biominalogy	GEO/09	single	6	48	Frontal lesson	In-person
Naturalistic collections	GEO /06	single	6	48	Frontal lesson	In-person
Elements of Geophysics applied to the environment	GEO /11	single	6	48	Frontal lesson	In-person
Coastal and underwater geomorphology	GEO /04	single	6	48	Frontal lesson	In-person
Geological hazards in natural hiking	GEO /05	single	6	48	Frontal lesson	In-person
Marine biology	BIO/07	single	6	48	Frontal lesson	In-person
Ethnological botany	BIO/02	single	6	48	Frontal lesson	In-person
Ethnozology	BIO/05	single	6	48	Frontal lesson	In-person
Ethology	BIO/05	single	6	48	Frontal lesson	In-person
Paleobotany	BIO/02	single	6	48	Frontal lesson	In-person

List of propaedeuticities

The preparatory exams for each course are defined in Annex B2; they are also preparatory in the third-year exams the courses of "General and inorganic chemistry with laboratory", "Chemistry organic with laboratory", "Mathematical Institutions", "Physics with laboratory".



ANNEX 2.1

DEGREE PROGRAM DIDACTIC REGULATIONS SCIENCES FOR NATURE AND THE ENVIRONMENT CLASS L-32

School: Polytechnic of Basic Sciences

Department: Biology

Didactic Regulations in force since the academic year 2024-2025

Common to both curricula (Biodiversity Monitoring and Environmental Hiking Guides)

Course: Institutions of Mathematics	Teaching Language: Italian
SSD (Subject Areas): MAT/01- 09	CREDITS: 9
Course year: first	Type of Educational Activity: A - basic
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field includes skills and areas of research related to the study, from both theoretical and applied perspectives, of Mathematical Physics, Rational Mechanics and more generally of Dynamical Systems, using both analytical and geometrical techniques. It also studies relativistic theories in their physical-mathematical aspects. The teaching skills of this area also cover all institutional aspects of basic mathematics.	
Objectives: Knowledge and understanding skills: Knowledge and definition and possible interpretations of mathematical objects. Knowledge of theorems and understanding of their meaning. Ability to use computational tools to be able to work on mathematical models of natural phenomena. Construction of simple mathematical models. Development of knowledge and ability to apply algorithm design methodologies. Evaluation of the results obtained.	
Propaedeuticities: None	
Is a propaedeuticity for: Third-year examinations	
Types of examinations and other tests: Written and oral examination	

Course: General and inorganic chemistry and laboratory	Teaching Language: Italian
SSD (Subject Areas): CHIM/03	CREDITS: 8
Course year: first	Type of Educational Activity: A – basic

Teaching Methods: In-person
Contents extracted from the SSD declaratory consistent with the training objectives of the course: General and Inorganic Chemistry deals with the chemical properties of the elements and their inorganic compounds, of natural and synthetic origin, in their theoretical and applicative aspects, having as its basis the study and in-depth analysis of the periodic system of the elements.
Objectives: The course is aimed at providing the basic concepts of General and Inorganic Chemistry for the understanding of the properties and transformations of matter considering its atomic and molecular composition, its reactivity and chemical equilibrium. Some laboratory exercises aim to guarantee a first experimental approach to the study of chemistry.
Propaedeuticities: None
Is a propaedeuticity for: None
Types of examinations and other tests: Written and oral examination

Course: General biology with laboratory	Teaching Language: Italian
SSD (Subject Areas): BIO/06	CREDITS: 9
Course year: first	Type of Educational Activity: C – related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the field represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From the structural point of view, the fundamental correlations between the molecular, cellular, tissue and organological levels are explored; from the embryological-evolutionary point of view, the relationships between phylogeny and morphogenesis are studied in order to identify at the various levels, including through a comparative approach, the interconnection between structure, function and adaptation, in various processes such as reproduction, development, endocrine and neural integration, and immune defense. The field includes as characterizing disciplines comparative anatomy, cell biology, developmental and evolutionary biology of vertebrates, and animal cytology and histology.	
Objectives: The main objectives of the teaching are to introduce knowledge of the chemical and molecular basis of life, the study of the structure and functions of cells, the basic mechanisms of transmission of genetic information, and the basic principles of reproduction and development.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Physics with laboratory	Teaching Language: Italian
SSD (Subject Areas): FIS/01-07	CREDITS: 8
Course year: first	Type of Educational Activity: A - basic
Teaching Methods: In-person	

Contents extracted from the SSD declaratory consistent with the training objectives of the course:

Includes the application of innovative physical methods and techniques necessary for the study and conservation of cultural heritage. It also includes skills suitable for the study and development of physical methodologies (theoretical and experimental) necessary both for the description and understanding of living matter in the environmental, biological, and medical context, and for the development and use of instrumentation necessary for the control and detection of physical phenomena in the context of prevention, diagnosis, and treatment. Competencies in this area also cover research in the fields of archaeometry and diagnostics of cultural heritage, environmental modeling, biophysics, and physical techniques of biomedical diagnostics, as well as in the field of radiation protection of man, the environment, and things.

Objectives:

Knowledge and understanding skills: Acquisition of the scientific method.
Ability to schematize simple real-world problems. Knowledge of the main physical quantities and systems of units.
Ability to perform operations between vectors. Knowledge of material point kinematics and dynamics. Knowledge of conservation laws of momentum and energy.
Knowledge of wave phenomena. Knowledge of the laws governing fluids. Basic knowledge of measurement error analysis. Ability to apply knowledge: Ability to make simple measurements in mechanics, thermology, and ability to analyze and graph data.
The course aims to develop the student's ability to apply concepts and methodologies to the study of real problems.

Propaedeuticities:

None

Is a propaedeuticity for:

Third-year exams

Types of examinations and other tests:

Written and oral examination

Course: General Botany with Laboratory	Teaching Language: Italian
SSD (Subject Areas): BIO/01	CREDITS: 9
Course year: first	Type of Educational Activity: A - basic
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field studies the Biology of Plants at all levels of organization, including autotrophic prokaryotes, algae and fungi, as well as their symbioses. Of these organisms, General Botany investigates, theoretically and experimentally, aspects of their structural and functional organization and their becoming, to establish their relationships and interpret, from an evolutionary perspective, their structures and functions, as well as their reproductive mechanisms. It delves into the ways in which cells and organs acquire the capacity to perform specialized functions and the articulation of processes that lead to the formation of complex organisms and the optimization of the reproductive process.	
Objectives: The course aims to provide students with knowledge of the morphological organization of plants, at the level of cells, tissues and organs, related to vital functions. The course will frame the role of plants in the context of natural cycles; all of which will be fundamental for the training of practitioners in the management of Protected Areas and for a valid dissemination of naturalistic culture.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course:	Teaching Language:
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General zoology with laboratory		Italian
SSD (Subject Areas): BIO/05		CREDITS: 9
Course year: first	Type of Educational Activity: A - basic	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: To provide students with basic knowledge of general zoology and methodologies for studying fauna, with an integrated adaptive approach. Broad-spectrum knowledge of the biological world, from protozoa to metazoa, with a look at the evolution of animal characteristics and the environment in which they live. The knowledge provided by the course will enable the Biology student to work in the field of animal biodiversity conservation.		
Objectives: Study of protozoa, metazoa and their evolution at the levels of organization, cellular, organismic, population and species. Research, conducted through theoretical and experimental, field and laboratory methodologies, investigates functional organization, reproduction, morphogenesis, development, and intra- and interspecific and environmental interactions.		
Propaedeuticities: None		
Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

Curriculum Biodiversity monitoring

Course: Mineralogy with laboratory		Teaching Language: Italian
SSD (Subject Areas): GEO/06		CREDITS: 9
Course year: second	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field is concerned with the study of minerals, their synthetic correspondents and, in general, crystalline and amorphous materials, with the aim of determining their structural and compositional variability, transformations under different environmental conditions, genetic and growth processes, also in relation to application aspects and by means of analytical, crystallographic, crystallochemical and experimental research. The contents of the field are essential to the understanding of natural materials, evolution and structure of the Earth and other planetary bodies. They also find effective expression in nature museology, natural heritage management, science education and geoscience education.		
Objectives: The student will have the tools to recognize macroscopically the most representative minerals, and their main physical and chemical characteristics. The basis will be laid for a correct interpretation from a minerogenic perspective of the main binary and ternary diagrams describing the phenomena of polymorphism and isomorphism.		
Propaedeuticities: General and inorganic chemistry with laboratory, Physics with laboratory		
Is a propaedeuticity for: None		
Types of examinations and other tests: Written and oral examination		

Course: Physical geography with laboratory		Teaching Language: Italian	
SSD (Subject Areas): GEO/04		CREDITS: 9	
Course year: second		Type of Educational Activity: B - characterizing	
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: With this study, students will be able to recognize and quantify the factors, phenomena, and exogenous processes that affect the Earth's surface and the shapes of the landscape as a function of the morphogenetic environments. Students will be competent to read topographic and thematic maps at different scales and orient themselves on the terrain. The adequate knowledge of the geographical-physical and geomorphological aspects, together with the reading of the maps, will allow students to trace the processes and evolution of the landscape, as well as to draw up geothematic maps, favoring the inclusion of the specialist in the naturalistic sector (parks, museums) for the protection and enhancement of the environment.			
Objectives: Knowledge of the genesis and structure of the Solar System and planet Earth. Understanding the role of the Earth's motions in the phenomena occurring in the atmosphere and hydrosphere and their interactions, starting from notions learned on atmospheric phenomena, oceanic circulation, and climate classification. Acquisition of basic knowledge on the processes of exogenous dynamics, geomorphic systems, and climate variations in the Quaternary. The water and lithogenic cycle, the analysis of fluvial, coastal, karst, and volcanic morphology to understand the processes of erosion, transport, and sedimentation and the main morphometric elements of the territory. Acquisition of primary tools for reading and interpreting topographic maps and orienting oneself on the terrain. Acquisition of basic GIS concepts.			
Propaedeuticities: None			
Is a propaedeuticity for: None			
Types of examinations and other tests: Oral exam			

Course: Systematic botany with laboratory		Teaching Language: Italian	
SSD (Subject Areas): BIO/02		CREDITS: 9	
Course year: second		Type of Educational Activity: B - characterizing	
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: "Systematic Botany has as its object the taxonomic and biological diversity of plants"; "Systematic Botany includes ... the reconnaissance and constitution of elementary taxa, the theory and classificatory techniques of diversity groups, and their projection into concrete taxonomic systems ..."; The contents of Systematic Botany find expression in naturalistic museology, particularly at ... Herbaria."			
Objectives: The course provides in-depth knowledge on the classification, systematics, phylogeny and, in general, the biology of major plant taxa. It also provides methodological and operational skills on the identification and classification of plant organisms and the establishment of specimens and collections for herbaria.			
Propaedeuticities: General botany			
Is a propaedeuticity for: None			

Types of examinations and other tests: Oral examination

Course: Systematic zoology with laboratory	Teaching Language: Italian
SSD (Subject Areas): BIO/05	CREDITS: 9
Course year: second	Type of Educational Activity: B - characterizing
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of protozoa, metazoa and their evolution at the population, species and community levels. Research, conducted through theoretical and experimental, field and laboratory methodologies, investigates functional organization, reproduction, morphogenesis, development, systematics and phylogeny.	
Objectives: Acquisition of skills aimed at animal determination. Knowledge of the evolution of animal diversity and the methodological tools for the purpose of studying evolutionary relationships among animal phyla. Develop skills to work in the field of biodiversity conservation.	
Propaedeuticities: General zoology	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Organic chemistry with laboratory	Teaching Language: Italian
SSD (Subject Areas): CHIM/06	CREDITS: 6
Course year: second	Type of Educational Activity: A - basic
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Organic Chemistry deals with Carbon compounds, both of natural and synthetic origin, by developing efficient, (stereo)selective, catalytic and environmentally friendly synthesis methodologies. Also studied are elucidation of the mechanisms by which organic compounds are formed and transformed in the laboratory and in natural and environmental systems, their supramolecular interactions and structure-reactivity relationships, synthesis design and implementation of new catalysts, biologically active compounds and new organic materials. He is also interested in Didactics and History of Chemistry.	
Objectives: Basic knowledge and ability to understand organic chemistry topics, highlighting the relationships between structure and reactivity of molecules as well as the main mechanisms of chemical reactions. Overview of the main categories of organic pollutants found in environmental matrices. Ability to apply knowledge: the laboratory provides this module with an initial experimental approach.	
Propaedeuticities: None	
Is a propaedeuticity for: Third-year exams	
Types of examinations and other tests: Written and oral examination	

Course:	Teaching Language:
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Geology with laboratory		Italian
SSD (Subject Areas): GEO/02		CREDITS: 9
Course year: second	Type of Educational Activity: B - characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Geochronological reconstruction of physical and biological events that occurred throughout the history of the earth; the analysis of stratigraphic successions, the mapping of sedimentary bodies, active and fossil, their description, organization and spatial and temporal association, their cartographic representation; paleoenvironmental, paleoclimatic and paleogeographic reconstruction; the study of current marine and continental sedimentary environments and their dynamics on the globe and in a planetary context.		
Objectives: Provide elements of general knowledge of the main geological processes operating in the Earth system and the products derived from them. Educate to a systemic vision that takes into account the relationships between processes/products of the Lithosphere and the other components of the exosphere (Atmosphere, Hydrosphere, Biosphere). Prepare for the management of territorial problems through the ability to read geological maps, geological sections, rock recognition, relationships between geological bodies in the field.		
Propaedeuticities: none		
Is a propaedeuticity for: none		
Types of examinations and other tests: Oral examination		

Course: Ecology with laboratory		Teaching Language: Italian
SSD (Subject Areas): BIO/07		CREDITS: 9
Course year: third	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field studies the relationships of autotrophic and heterotrophic organisms - terrestrial, marine and freshwater - with their environment, biotic interactions, population dynamics and regulation, community ecology, energy flow and matter cycling, ecosystem processes, biosphere sustainability, natural capital, conservation and management of ecosystems and biodiversity.		
Objectives: The course objectives provide the conceptual basis and interdisciplinary interpretive framework necessary for and preparatory to other courses, especially those with explicit ecological content.		
Propaedeuticities: Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory		
Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

Course: Lithology with laboratory		Teaching Language: Italian
SSD (Subject Areas): GEO/07		CREDITS: 9

Course year: Third	Type of Educational Activity: B - characterizing
Teaching Methods: Inpresence, lectures with practical exercises	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field covers the following areas of expertise: structure, composition, origin and systematics of igneous, metamorphic and sedimentary rocks; petrogenetic and geodynamic significance of petrographic associations; thermodynamic interpretation and modeling of petrogenetic processes on the stability of mineral associations in rocks and magmas. The above contents are essential for understanding the structure and evolution of the Earth and other planetary bodies. They also find effective expression in nature museology, natural heritage management, science education and geoscience education.	
Objectives: The course aims to provide the basic elements for a correct interpretation of petrogenetic processes and for the recognition and classification of igneous, sedimentary and metamorphic rocks	
Propaedeuticities: General and Inorganic Chemistry and Mineralogy.	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Paleontology with laboratory	Teaching Language: Italian
SSD (Subject Areas): GEO/01	CREDITS: 9
Course year: third	Type of Educational Activity: C – related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector concerns the reconstruction of palaeoenvironments and the evolution of life. The scientific content of the field forms the basis of geoscience education and divulgation, nature museology, and the identification, characterisation and conservation of geo-paleontological sites. Palaeontology deals with the study of life in the geological past in order to reconstruct its history, interpret and place events and the evolutionary process in time in the light of fossil evidence, consisting of organic remains and traces of activity. Some of the aims are the systematic and phylogenetic framing of fossils, the reconstruction in space and time of palaeocommunities and their relationships, the study of preservation mechanisms and the analysis of the sedimentary role. The main applications concern the use of fossils as indicators of age and environment, to the construction of time scales and for palaeoenvironmental, palaeoclimatic, palaeoceanographic and palaeogeographic reconstruction. It also analyses major biological crises in order to interpret global changes, including recent ones.	
Objectives: To introduce to the knowledge of the main fossil groupings and their use in geological and environmental sciences. To introduce to the knowledge of the main micro- and macro-fossil groups useful in palaeoecology.	
Propaedeuticities: none	
Is a propaedeuticity for: none	
Types of examinations and other tests: Oral examination	

Course: Animal physiology with laboratory	Teaching Language: Italian
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SSD (Subject Areas): BIO/09		CREDITS: 9
Course year: third	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the vital functions of animals and examines how the living organism achieves and maintains homeostasis of its internal medium at the molecular, cellular, and tissue levels in the context of changes in its environment.		
Objectives: The purpose of the course is to provide the basic knowledge necessary for understanding the functions of the major organs and systems of vertebrates.		
Propaedeuticities: Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory		
Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

Course: Hygiene and environmental protection		Teaching Language: Italian
SSD (Subject Areas): MED/42		CREDITS: 6
Course year: third	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field is concerned with scientific and educational activity in the field of general and applied hygiene; the field has specific expertise in the field of applied environmental hygiene, preventive medicine, epidemiology, public health and health education.		
Objectives: To acquire knowledge and competence on methodologies of analysis, prevention-mitigation and risk communication. To be able to identify causal agents of pathologies and pollution phenomena, as well as indicators of protection, quality and safety in environmental matrices. Applications and limitations found in environmental regulations.		
Propaedeuticities: Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory		
Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

Curriculum Environmental hiking guides

Course: Rocks and their constituents		Teaching Language: Italian
SSD (Subject Areas): GEO/07		CREDITS: 6
Course year: second	Type of Educational Activity: B - characterizing	
Teaching Methods: In-presence		

Contents extracted from the SSD declaratory consistent with the training objectives of the course:

The field covers the following areas of expertise: structure, composition, origin and systematics of igneous, metamorphic and sedimentary rocks; petrogenetic and geodynamic significance of petrographic associations; thermodynamic interpretation and modeling of petrogenetic processes, including experimental studies, on the stability of mineral associations in rocks and magmas; petrochemical and petrophysical characterization of rocks; petrogenetic-structural surveys and studies of igneous and metamorphic complexes; applied studies with special regard to coherent and incoherent rocks of industrial, environmental and cultural interest. The above contents are essential for understanding the structure and evolution of the Earth and other planetary bodies. They also find effective expression in nature museology, natural heritage management, science education and geoscience education.

Objectives:

The course curriculum is intended to provide the student with a basic knowledge of the characteristics of rocks and an understanding of the minerals that constitute them. Such knowledge will enable the student to understand and interpret the environments in which rocks and minerals are formed. In addition, the course will provide the basic knowledge to classify rocks both in the field and in the laboratory.

Propaedeuticities:

None

Is a propaedeuticity for:

None

Types of examinations and other tests:

Oral examination

Course: Physical geography with laboratory		Teaching Language: Italian	
SSD (Subject Areas): GEO/04		CREDITS: 9	
Course year: second		Type of Educational Activity: C – related or supplementary	
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: With this study, students will be able to recognize and quantify the factors, phenomena, and exogenous processes that affect the Earth's surface and the shapes of the landscape as a function of the morphogenetic environments. Students will be competent to read topographic and thematic maps at different scales and orient themselves on the terrain. The adequate knowledge of the geographical-physical and geomorphological aspects, together with the reading of the maps, will allow students to trace the processes and evolution of the landscape, as well as to draw up geothematic maps, favoring the inclusion of the specialist in the naturalistic sector (parks, museums) for the protection and enhancement of the environment.			
Objectives: Knowledge of the genesis and structure of the Solar System and planet Earth. Understanding the role of the Earth's motions in the phenomena occurring in the atmosphere and hydrosphere and their interactions, starting from notions learned on atmospheric phenomena, oceanic circulation, and climate classification. Acquisition of basic knowledge on the processes of exogenous dynamics, geomorphic systems, and climate variations in the Quaternary. The water and lithogenic cycle, the analysis of fluvial, coastal, karst, and volcanic morphology to understand the processes of erosion, transport, and sedimentation and the main morphometric elements of the territory. Acquisition of primary tools for reading and interpreting topographic maps and orienting oneself on the terrain. Acquisition of basic GIS concepts.			
Propaedeuticities: None			
Is a propaedeuticity for: None			
Types of examinations and other tests: Oral examination			

Course:	Teaching Language:
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Systematic botany with laboratory		Italian
SSD (Subject Areas): BIO/02		CREDITS: 9
Course year: second	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: "Systematic Botany has as its object the taxonomic and biological diversity of plants"; "Systematic Botany includes ... the reconnaissance and constitution of elementary taxa, the theory and classificatory techniques of diversity groups, and their projection into concrete taxonomic systems ..."; The contents of Systematic Botany find expression in naturalistic museology, particularly at ... Herbaria."		
Objectives: The course provides in-depth knowledge on the classification, systematics, phylogeny and, in general, the biology of major plant taxa. It also provides methodological and operational skills on the identification and classification of plant organisms and the establishment of specimens and collections for herbaria.		
Propaedeuticities: General botany with laboratory		
Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

Course: Geology with laboratory		Teaching Language: Italian
SSD (Subject Areas): GEO/02		CREDITS: 9
Course year: second	Type of Educational Activity: B - characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Geochronological reconstruction of physical and biological events that occurred throughout the history of the earth; the analysis of stratigraphic successions, the mapping of sedimentary bodies, active and fossil, their description, organization and spatial and temporal association, their cartographic representation; paleoenvironmental, paleoclimatic and paleogeographic reconstruction; the study of current marine and continental sedimentary environments and their dynamics on the globe and in a planetary context.		
Objectives: Provide elements of general knowledge of the main geological processes operating in the Earth system and the products derived from them. Educate to a systemic vision that takes into account the relationships between processes/products of the Lithosphere and the other components of the exosphere (Atmosphere, Hydrosphere, Biosphere). Prepare for the management of territorial problems through the ability to read geological maps, geological sections, rock recognition, relationships between geological bodies in the field.		
Propaedeuticities: none		
Is a propaedeuticity for: none		
Types of examinations and other tests: Oral examination		

Course: Digital Cartography and Geographic Information Systems.		Teaching Language: Italian
SSD (Subject Areas): GEO/04		CREDITS: 6
Course year: second	Type of Educational Activity: B - characterizing	

Teaching Methods: In-person
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Development of cartographic methods and techniques, including the use of geographic information systems, for data representation and processing with emphasis on exogenous processes, geomorphological assets, and environmental issues
Objectives: The course aims to provide information necessary: for the management and analysis, using GIS software, of geo-referenced data collected in the field related to sites of geological and naturalistic interest; for the creation of thematic maps representative of the places visited, aimed at their enhancement and use by hikers.
Propaedeuticities: None
Is a propaedeuticity for: None
Types of examinations and other tests: Oral examination

Course: Systematic zoology with laboratory	Teaching Language: Italian
SSD (Subject Areas): BIO/05	CREDITS: 9
Course year: second	Type of Educational Activity: B - characterizing
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of protozoa, metazoa and their evolution at the population, species and community levels. Research, conducted through theoretical and experimental, field and laboratory methodologies, investigates functional organization, reproduction, morphogenesis, development, systematics and phylogeny.	
Objectives: Acquisition of skills aimed at animal determination. Knowledge of the evolution of animal diversity and the methodological tools for the purpose of studying evolutionary relationships among animal phyla. Develop skills to work in the field of biodiversity conservation.	
Propaedeuticities: General zoology	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Organic chemistry with laboratory	Teaching Language: Italian
SSD (Subject Areas): CHIM/06	CREDITS: 6
Course year: second	Type of Educational Activity: A - basic
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Organic Chemistry deals with Carbon compounds, both of natural and synthetic origin, by developing efficient, (stereo)selective, catalytic and environmentally friendly synthesis methodologies. Also studied are elucidation of the mechanisms by which organic compounds are formed and transformed in the laboratory and in natural and environmental systems, their supramolecular interactions and structure-reactivity relationships, synthesis design and	

implementation of new catalysts, biologically active compounds and new organic materials. He is also interested in Didactics and History of Chemistry.

Objectives:

Basic knowledge and ability to understand organic chemistry topics, highlighting the relationships between structure and reactivity of molecules as well as the main mechanisms of chemical reactions. Overview of the main categories of organic pollutants found in environmental matrices. Ability to apply knowledge: the laboratory provides this module with an initial experimental approach.

Propaedeuticities:

None

Is a propaedeuticity for:

Third-year exams

Types of examinations and other tests:

Written and oral examination

Course: Ecology with laboratory		Teaching Language: Italian	
SSD (Subject Areas): BIO/07		CREDITS: 9	
Course year: third	Type of Educational Activity: B - characterizing		
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field studies the relationships of autotrophic and heterotrophic organisms - terrestrial, marine and freshwater - with their environment, biotic interactions, population dynamics and regulation, community ecology, energy flow and matter cycling, ecosystem processes, biosphere sustainability, natural capital, conservation and management of ecosystems and biodiversity.			
Objectives: The course objectives provide the conceptual basis and interdisciplinary interpretive framework necessary for and preparatory to other courses, especially those with explicit ecological content.			
Propaedeuticities: Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory			
Is a propaedeuticity for: None			
Types of examinations and other tests: Oral examination			

Course: Flora and Fauna of the Mediterranean		Teaching Language: Italian	
SSD (Subject Areas): BIO/02 BIO/05		CREDITS: 6 6	
Course year: third	Type of Educational Activity: B – characterizing A-basic		
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Systematic Botany (BIO/02) is concerned with the taxonomic and biological diversity of present and fossil plants- including in this notion both prokaryotic and eukaryotic photosynthetic organisms, fungi, and their symbionts-their evolution and the affinity relationships among them. Systematic Botany includes field floristic survey,			

<p>reconnaissance and establishment of elementary taxa, theory and classification techniques of diversity groups, their projection into concrete taxonomic systems, and their use for biogeographical reconstructions. Tools of Systematic Botany are the acquisition, synthesis, and comparative analysis of chorological, biological-reproductive, population, paleobotanical, palynological, morpho-anatomical, histological, cytological, cytogenetic, phytochemical, genomic, and molecular information.</p> <p>The BIO/05 area studies metazoans and their evolution at the population, species, and community levels. Research conducted through theoretical and experimental, field and laboratory methodologies on intra- and interspecific and environmental interactions, biogeography, systematics and phylogeny.</p>
<p>Objectives:</p> <p>The main objective of this course is to enable the acquisition of a basic knowledge of the techniques of expeditious field determination and the role of some Mediterranean plant species. At the end of the course the student is expected to be able to describe with adequate language the methods, principles and aims of modern plant systematics with special reference to the families, genera and species living in the Mediterranean basin.</p> <p>The goal is also basic knowledge of field determination techniques and the ecological role of some Mediterranean animal species. To provide the student with a clear and structured view of animal diversity, methodologies used in the recognition of taxa of the different taxonomic groups in the Mediterranean basin.</p>
<p>Propaedeuticities:</p> <p>Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory</p> <p>Is a propaedeuticity for:</p> <p>None</p>
<p>Types of examinations and other tests:</p> <p>Oral examination</p>

Course: Paleontology with laboratory	Teaching Language: Italian
SSD (Subject Areas): GEO/01	CREDITS: 9
Course year: third	Type of Educational Activity: C – related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course:	
<p>The sector concerns the reconstruction of palaeoenvironments and the evolution of life. The scientific content of the field forms the basis of geoscience education and divulgation, nature museology, and the identification, characterisation and conservation of geo-paleontological sites. Palaeontology deals with the study of life in the geological past in order to reconstruct its history, interpret and place events and the evolutionary process in time in the light of fossil evidence, consisting of organic remains and traces of activity. Some of the aims are the systematic and phylogenetic framing of fossils, the reconstruction in space and time of palaeocommunities and their relationships, the study of preservation mechanisms and the analysis of the sedimentary role. The main applications concern the use of fossils as indicators of age and environment, to the construction of time scales and for palaeoenvironmental, palaeoclimatic, palaeoceanographic and palaeogeographic reconstruction. It also analyses major biological crises in order to interpret global changes, including recent ones.</p>	
Objectives:	
<p>To introduce to the knowledge of the main fossil groupings and their use in geological and environmental sciences. To introduce to the knowledge of the main micro- and macro-fossil groups useful in palaeoecology.</p>	
Propaedeuticities:	
None	
Is a propaedeuticity for:	
None	
Types of examinations and other tests:	
Oral examination	

Course:	Teaching Language:
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Volcanology and hiking in volcanic areas		Italian
SSD (Subject Areas): GEO/08		CREDITS: 6
Course year: third	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Geochemistry studies the genesis, distribution and behavior of elements and nuclides in nature and their applications in the Earth Sciences, using the methods of chemistry and chemistry-physics. Using the same methods, Volcanology studies eruptive dynamics and its relationship to processes of magmatic origin and evolution from both experimental and modeling perspectives. The expertise of the field is essential in understanding and geochronologically defining the evolutionary processes of the solid Earth, hydrosphere, atmosphere, and biosphere. The application of geochemical and volcanological approaches is crucial in planning the exploitation of strategic natural resources, including geothermal energy, in controlling and quantifying soil, water, and air pollution processes, and in mitigating natural hazards. The field also takes care of science education and geoscience teaching.		
Objectives: Volcanic phenomena are approached starting from the initiation of eruptions to their effects on the territory and their implications in terms of landscape and environment. Particular emphasis will be given to the ability of large eruptions to quickly bury the territory surrounding volcanoes while preserving, as at Pompeii, Herculaneum and Akrotiri, all material aspects of ancient human settlements.		
Propaedeuticities: Institutions of Mathematics, Physics with lab, General and Inorganic Chemistry with lab, Organic Chemistry with lab Is a propaedeuticity for: None		
Types of examinations and other tests: Written and oral examination		

Course: Hygiene and environmental protection		Teaching Language: Italian
SSD (Subject Areas): MED/42		CREDITS: 6
Course year: third	Type of Educational Activity: B - characterizing	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field is concerned with scientific and educational activity in the field of general and applied hygiene; the field has specific expertise in the field of applied environmental hygiene, preventive medicine, epidemiology, public health and health education.		
Objectives: To acquire knowledge and competence on methodologies of analysis, prevention-mitigation and risk communication. To be able to identify causal agents of pathologies and pollution phenomena, as well as indicators of protection, quality and safety in environmental matrices. Applications and limitations found in environmental regulations.		
Propaedeuticities: Institutions of Mathematics, Physics with laboratory, General and Inorganic Chemistry with laboratory, Organic Chemistry with laboratory Is a propaedeuticity for: None		
Types of examinations and other tests: Oral examination		

At student's choice courses

Course: Biomineralogy		Teaching Language: Italian	
SSD (Subject Areas): GEO/09		CREDITS: 6	
Course year: second	Type of Educational Activity: D – at the student's choice		
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Mineralogical skills are essential in research relating to geosphere-biosphere interactions and biomineralizations. Mineralogy deals with the genesis, growth, structure, chemical-physical and systematic properties of biominerals using and developing analytical (crystallographic and crystal chemical) methodologies such as diffractometry, microscopy and spectroscopy.			
Objectives: The course aims to provide students with the basic notions related to minerogenesis in the biological environment, to the understanding of the mechanisms of crystalline growth applied to biological systems, to the recognition of the main biominerals and their functions in (plant and animal) biological tissues, to the knowledge of the analytical techniques for the characterization of the most important biominerals in the geological and biological-medical fields			
Propaedeuticities: Basic knowledge of inorganic chemistry and optical physics			
Is a propaedeuticity for: none			
Types of examinations and other tests: Oral examination			

Course: Naturalistic Collections		Teaching Language: Italian	
SSD (Subject Areas): GEO/06		CREDITS: 6	
Course year: second	Type of Educational Activity: D – at the student's choice		
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The contents of the sector find effective expression in naturalistic museology, in the management of natural assets, in scientific education and in geoscience teaching.			
Objectives: The course aims to provide students with basic knowledge about the birth of Modern Science Museums through the history and development of nature collections. A journey through the history, the meeting and the knowledge of the spirit of the first naturalist-collectors will lead students to understand the importance of the main functions of a modern museum today, which also involve visiting historical museum collections.			
Propaedeuticities: not needed			
Is a propaedeuticity for: not needed			
Types of examinations and other tests: Oral examination			

Course:	Teaching Language:
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Ethnological botany	Italian
SSD (Subject Areas): BIO/02	CREDITS: 6
Course year: second	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: "Systematic Botany is concerned with the taxonomic and biological diversity of plants..."; ". The contents of Systematic Botany find expression in naturalistic museology."	
Objectives: The course will provide basic information on the taxonomic and biological diversity of the most important plant species used by man, with special reference to traditional and historical uses, including with reference to the museum display of plant-derived artifacts.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Ethology	Teaching Language: Italian
SSD (Subject Areas): BIO/05	CREDITS: 6
Course year: third	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of metazoans at the population, species, and community levels. Research, conducted through theoretical and experimental, field and laboratory methodologies, on behavior, intra- and interspecific interactions, and with the environment.	
Objectives: To know the principles and methodologies underlying the study of animal behavior. To know the behavioral interactions between animal and the natural or artificial environment, in which they live. To develop skills in analyzing the variability of animal behavior of different species and the individual variability within each species. Know the catalog of species behaviors (Ethogram) and criteria for assessing conservation status and safeguarding animal welfare.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Marine Biology	Teaching Language: Italian
SSD (Subject Areas): BIO/07	CREDITS: 6
Course year: third	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	

<p>Contents extracted from the SSD declaratory consistent with the training objectives of the course:</p> <p>Autotrophic and heterotrophic organisms of the marine environment. Biotic interactions (predation, competition, parasitism, symbiosis), resource utilization, and marine population dynamics. Marine communities, spatio-temporal variations and mechanisms regulating marine biodiversity. Responses of marine ecosystems to global changes and anthropogenic alterations.</p>
<p>Objectives:</p> <p>The objectives of the course are to provide the basics of the marine ecosystem and the structural and functional aspects of communities in the pelagic and benthic environments.</p> <p>The mechanisms underlying production cycles, and their spatio-temporal evolution in different marine ecological contexts, will be addressed.</p> <p>Particular attention will be paid to the concepts of biodiversity and sustainability as a tool for theoretical and applied analysis, and for assessing changes in marine ecosystems in relation to ongoing climate warming.</p>
<p>Propaedeutivities:</p> <p>None</p> <p>Is a propaedeuticity for:</p> <p>None</p>
<p>Types of examinations and other tests:</p> <p>Oral examination</p>

<p>Course:</p> <p>Geological hazards in nature hiking</p>	<p>Teaching Language:</p> <p>Italian</p>
<p>SSD (Subject Areas): GEO/05</p>	<p>CREDITS: 6</p>
<p>Course year: second</p>	<p>Type of Educational Activity: D – at the student's choice</p>
<p>Teaching Methods:</p> <p>In-person</p>	
<p>Contents extracted from the SSD declaratory consistent with the training objectives of the course:</p> <p>The competencies of this area include: soil defense, with special attention to landslides, deep gravitative slope deformations, subsidence and geopedology; hydrogeology, with reference to the search for aquifers in various geological contexts, the study of groundwater circulation, the assessment of the vulnerability of aquifers, their management and defense against pollution; the technical characterization of loose and stony rocks, including in relation to slope stability; the procurement and study of natural construction materials; geological-technical surveying, geological exploration of the subsurface and thematic mapping, aimed at urban and territorial planning, including environmental impact and hydrogeological risk assessment; the study of the substrate for geotechnical and civil engineering purposes and for the definition of geological-technical models; and geoscience education.</p>	
<p>Objectives:</p> <p>The teaching aims to provide the cognitive basis inherent in: i) geological hazards and environments in which specific phenomenologies may develop; ii) methods of susceptibility, hazard and risk assessment according to the different expected phenomenologies (e.g. landslides, floods, etc.); iii) risk mitigation measures and early warning; iv) criteria for defining nature routes, in light of existing geological hazards.</p>	
<p>Propaedeutivities:</p> <p>None</p> <p>Is a propaedeuticity for:</p> <p>None</p>	
<p>Types of examinations and other tests:</p> <p>Oral examination</p>	

<p>Course:</p> <p>Coastal and underwater geomorphology</p>	<p>Teaching Language:</p> <p>Italian</p>
<p>SSD (Subject Areas): GEO/04</p>	<p>CREDITS: 6</p>
<p>Course year: second</p>	<p>Type of Educational Activity: D – at the student's choice</p>

Teaching Methods: In-person
Contents extracted from the SSD declaratory consistent with the training objectives of the course: With this study, students will recognize and quantify the exogenous factors, phenomena, and processes that affect the coastal and underwater environment and the morphologies of the emerged and submerged landscape. Adequate knowledge of the subject will allow students to trace the processes and evolution of the emerged and submerged waterscape. It will favor the inclusion of specialists in the naturalistic sector (parks, museums) to protect and enhance the environment.
Objectives: Students must acquire knowledge of the coastal environment as a land-sea interface, on the various classifications of the coastland and the coastal climate. Students must know the movements of the sea, the characteristics and actions of wave motion and tides, and the variations in sea level in the Quaternary, Holocene, and historical times. The central topics are the recognition of the morphology, genesis, and evolution of the rocky high coasts and the clastic low coasts. The notions will help students understand the coastal dynamics of the emerged and submerged beach, the relationships with the canyons and underwater valleys, the historical variations of the Italian coasts, and the coastal defense methods.
Propaedeutivities: None Is a propaedeuticity for: None
Types of examinations and other tests: Oral examination

Course: Elements of geophysics applied to the environment	Teaching Language: Italian
SSD (Subject Areas): GEO/11	CREDITS: 6
Course year: second	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Exploration techniques and applicability of geophysical methods for the determination of geological structures and physical characteristics of the subsurface, land resources and environmental protection, both onshore and on the seabed. Development of methodologies for modelling, data processing and interpretation. Subsoil geophysical prospecting is applied to the study of the earth's crust, to the exploitation of geo-resources (hydrocarbons, endogenous fluids, minerals, water resources), to the determination of seismic, volcanic, geological and hydrogeological risks, to the characterisation, with geophysical methodologies, of the environmental components relating to the soil and subsoil and to the hydrogeological environment, to the study of the substrate for geological, geotechnical, archaeological, naturalistic and civil engineering purposes.	
Objectives: Supply the essential knowledge of geophysical prospecting methodologies for studying the physical and geometrical characteristics of the subsurface, shallow crustal structures, land resources and environmental protection. Knowledge of the physical and methodological principles underlying the prospecting methods, methods for carrying out surveys, the criteria for analysing and interpreting geophysical measurements. All according to modern techniques of very high-resolution acquisition and inversion of data in tomographic mode. Understanding the possibilities of application in the environmental field (soil and groundwater pollution, hydrogeological risk, control and monitoring of landfills, volcano monitoring, ...) through the integrated use of different geophysical methodologies.	
Propaedeutivities: None Is a propaedeuticity for: None	

Types of examinations and other tests: Oral examination

Course: Paleobotany	Teaching Language: Italian
SSD (Subject Areas): BIO/02	CREDITS: 6
Course year: second	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Systematic Botany has as its object the taxonomic and biological diversity of current and fossil plants - including in this notion both prokaryotic and eukaryotic photosynthetic organisms, fungi, and their symbionts - their evolution and the affinity relationships that exist between them. Systematic Botany includes field floristic survey, the recognition and constitution of elementary taxa, the theory and classificatory techniques of diversity groups, their projection into concrete taxonomic systems, their use for biogeographical reconstructions. Tools of Systematic Botany are the acquisition, synthesis and comparative analysis of chorological, biological-reproductive, populationistic, paleobotanical, palynological, morpho-anatomical, histological, cytological, cytogenetic, phytochemical, genomic and molecular information. This information is processed with phenetic criteria, including numerical taxonomy, or with phylogenetic and cladistic criteria. The contents of Systematic Botany find expression in naturalistic museology, in particular in botanical gardens, herbariums and museums where the collections under investigation are cultivated and stored.	
Objectives: The course will provide useful knowledge for understanding the origins and forms of plant life in reference to vascular plants and will promote the ability to understand evolutionary processes. Furthermore, the course will allow the acquisition of skills that can contribute to the training of professional figures such as botanist and biologist.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral examination	

Course: Ethnozoology	Teaching Language: Italian
SSD (Subject Areas): BIO/05	CREDITS: 6
Course year: second	Type of Educational Activity: D – at the student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector deals with the study of protozoans, metazoans and their evolution at various levels of organisation, cellular, organismal, population and species, and community. In particular, the research, conducted through theoretical and experimental methodologies, in the field and in the laboratory, investigates functional organization, reproduction, morphogenesis and development, ecophysiology, behavior, intra- and interspecific interactions and with the environment, biogeography, systematics and phylogeny. Zoology, a science that characterizes the sector, constitutes a basic discipline in the field of life sciences also in reference to general biology, naturalistic museology and environmental education. Other disciplines in the sector have application relevance in the field of animal biotechnology, in that of monitoring animal biodiversity and faunal aspects of environmental impact assessment and in that of fauna management and conservation.	

Objectives:

Knowledge and understanding: the course will illustrate fundamental principles of Zoology, including classification and nomenclature, in relation to the use of animal species by man in both natural and anthropized systems. It will provide elements to correlate fauna with the territory, understand the use of animals as an essential resource for life and will illustrate the ethical aspects of ethnozoological research. Ability to apply knowledge: the course will provide, thanks to the multidisciplinary knowledge of the human-animal relationship, elements for the monitoring of anthropic systems for the purposes of sustainability and fauna conservation. Furthermore, the course will improve the skills for the training of professional figures such as zoologist and naturalist.

Propaedeuticities:

General zoology with laboratory

Is a propaedeuticity for:

None

Types of examinations and other tests:

Oral examination



ANNEX 2.2

DEGREE PROGRAM DIDACTIC REGULATIONS SCIENCES FOR THE NATURE AND ENVIRONMENT CLASS L-32

School: Polytechnic and Basic Sciences

Department: Biology

Didactic Regulations in force since the academic year 2024-2025

Training Activity: under Art. 10, c. 5, letter d	Training Activity Language: Italian
Content of the activities consistent with the training objectives of the course: Other knowledge useful for job placement; IT and telematics skills; training and orientation periods) that contribute to the achievement of the CdS objectives	CFU: 6
Course year: third	Type of Training Activity: F - Further training activities
Teaching Methods: in-person/by-distance	
Objectives: Acquisition of knowledge of the complex world of work in the biological sector and consolidation of one's perception and awareness regarding the relationship between university preparation and professional activities.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: aptitude	

Training Activity: under Art. 10, c. 5, letter d	Training Activity Language: Italian
Content of the activities consistent with the training objectives of the course:	CFU: 9

Other knowledge useful for job placement; IT and telematics skills; training and orientation periods) that contribute to the achievement of the CdS objectives	
Course year: third	Type of Training Activity: F - Further training activities
Teaching Methods: in-person/by-distance	
Objectives: Acquisition of knowledge of the complex world of work in the biological sector and consolidation of one's perception and awareness regarding the relationship between university preparation and professional activities.	
Propaedeuticities: None	
Is a propaedeuticity for: None	
Types of examinations and other tests: aptitude	