

DIDACTIC REGULATIONS OF THE DEGREE PROGRAM BIOLOGICAL SCIENCES

CLASS LM-6

School: Polytechnic of Basic Sciences

Department: Biology

Regulations in force since the academic year 2026/2027

ACRONYMS

CCD	[Commissione di Coordinamento Didattico]	Didactic Coordination Commission
CdS	[Corso/i di Studio]	Degree Program
CFU	[Crediti Formativi Universitari = 1 ECTS]	University training credits
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

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Art. 1

Object

1. This Didactic Regulations govern the organisational aspects of the CdS in Biological Sciences (class LM-6). The CdS in Biological Sciences is hinged in Department of Biology.
2. The CdS is governed by the Didactic Coordination Commission (CCD), pursuant to Art. 4 of the RDA.
3. 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

In compliance with the qualifying training objectives of the LM-6 degree class, the Master's Degree course in Biological Sciences is aimed at training figures of broad cultural depth and high professional profile whose activity may concern:

- activities to promote and develop scientific and technological innovation, as well as management and design of technologies.
- professional and project activities in fields related to biological disciplines, in public and private research institutes, in the sectors of industry, healthcare and public administration, with particular regard to integrated knowledge and the protection of animal and plant organisms, microorganisms, biodiversity, the environment; to the dissemination and scientific dissemination of the relevant knowledge; to the regulated use and increase of biotic resources; to clinical, biological and microbiological analysis laboratories, biological and quality control of products of biological origin and production chains; to the design, construction management and testing of systems relating to biological aspects (e.g. purification plants); to molecular-biological applications in the health, environmental and cultural heritage fields. The master's degree in Biological Sciences is divided into curricula dedicated to biological diagnostics, biosafety, environmental biology and neuroscience; in each curriculum the training path includes a block of characterizing courses, which ensure a solid preparation in basic biology, and a series of similar and integrative courses, which guarantee the necessary multidisciplinary insights and individual training paths.

The master's degree in Biological Sciences has as its qualifying educational objective the preparation of graduates who will have:

- a) a solid and integrated cultural preparation in basic biology and in various sectors of applied biology.
- b) high scientific and operational preparation in the disciplines that characterize the class.
- c) an in-depth knowledge of biological problems, instrumental methodologies, analytical tools and data acquisition and analysis techniques in the main fields of biology.
- d) ability to learn and apply innovations in the technical and experimental fields.
- e) ability to use the English language fluently, in written and oral form, as well as Italian, also with reference to disciplinary lexicons.
- f) ability to work with great autonomy, even taking on managerial roles that involve complete responsibility for projects, structures, and personnel.

For the purposes indicated, all curricular paths include training activities aimed at acquiring in-depth knowledge of basic biology and its applications, with particular attention to theoretical advances and technological applications.

Furthermore, the course of study will allow in-depth preparation in different professional fields, thanks to the division into curricula, which are organized didactically to give each individual in-depth knowledge and professional skills in the fields of: biological diagnostics, biosafety, environmental biology, and neuroscience.

To achieve these curricular objectives, the following will be further explored:

- i) the structural, functional and molecular aspects applied to biodiagnostics;
- ii) the study of experimental methods, including advanced and molecular ones in the field of biosafety.
- iii) structural, functional, and ecosystem-based aspects in the assessment of environmental quality and biodiversity conservation.
- iv) the study of structural, functional, and molecular aspects of neuroscience.

An important part of the training course will be the carrying out of laboratory activities, aimed at the preparation of an experimental thesis, and aimed at the application and deepening of specific knowledge acquired which will allow you to learn the correct ways in which to approach and resolve the problems that the biologist will find himself faced in the various relevant work fields.

Thanks to carrying out an internship in a biological research laboratory, or an analytical or monitoring laboratory, or a production company in the biological, biochemical, pharmaceutical or biotechnological field, or a healthcare facility, or a territorial body active in environmental matters or conservation practices, a park or a nature reserve, or a structure engaged in voluntary activities, or alternatively through the acquisition of further knowledge useful for entering the world of work, the student acquires knowledge of the complex world of work in the organic sector and consolidates one's perception and awareness of the relationship between university preparation and professional activities.

Graduates with a master's degree in Biological Sciences will acquire at least one European Union language in addition to Italian and will possess adequate knowledge for the use of IT tools, necessary in the specific field of competence and for the exchange of general information.

Art. 3

Professional profile and work opportunities

Based on Presidential Decree 328/01, graduates can take the state exam to qualify to practice the profession of Biologist and consequently obtain registration in the National Order of Biologists (section B). Graduates in Biological Sciences will be able to carry out technical-operational tasks and independent professional and support activities within the limits indicated by the law establishing the biologist system (Law 396/67 of 5 May 1967). The course prepares you for the profession of biologist, as regulated by Law 24 May 1967, n. 396 and by the Presidential Decree 5 June 2001, n. 328, after passing the State Exam.

The object of the professional activity consists in covering roles of high responsibility to be carried out independently in:

- control of activity, sterility, harmlessness of insecticides, medicines, enzymes, serums, vaccines, radioisotopes; biological analyses in the healthcare area, including serological, immunological, pregnancy, metabolic and genetic analyses.

- analysis and biological controls of water (including drinkable and mineral) and evaluation of environmental parameters and that of the integrity of natural ecosystems.
- identification of pathogens affecting living beings, including humans, and those harmful to the environment, foodstuffs, cultural heritage, and the indication of the relevant means of control.
- identification and control of goods of biological origin.
- environmental impact assessment, relating to biological-ecological aspects.

Other possible professional opportunities for graduates are in the field of medical-scientific information and, after continuing their studies, in the field of teaching in middle and high schools.

Skills associated with the function:

The master's graduate in Biological Sciences possesses solid and integrated skills in basic biology and in various sectors of applied biology, as well as an in-depth knowledge of biological problems, instrumental methodologies, analytical tools and data acquisition and analysis techniques in all fields of biology, with particular attention to pathophysiological, biodiagnostic, environmental, biosafety and neuroscience investigations.

This involves:

- in-depth conceptual and operational knowledge of the methodologies used in biochemistry, molecular biology, genetics, microbiology, including the manipulation and analysis of biological macromolecules, microorganisms, cells and complex organisms for pathophysiological, bio-diagnostic, environmental, biosafety and neuroscience.
- knowledge of at least one European Union language, in addition to Italian, in the specific area of expertise.
- adequate skills and tools for communication and information management.
- ability to work in a group environment, independently and to have the ability to integrate into work environments.
- possession of basic cognitive tools for continuously updating one's knowledge.

Employment opportunities:

Graduates with a master's degree in Biological Sciences will be able to hold roles of high responsibility as a freelancer (subject to registration with the National Order of Biologists) or as an employee, also taking on managerial roles, in companies or organizations in the following sectors:

- Production and technological activities in laboratories for clinical, biological, and microbiological analysis, control, and quality of products of biological origin.
- Activities for the promotion and development of scientific and technological innovation.
- Activities relevant to biological applications in the industrial, healthcare, food, environmental and cultural heritage fields.
- Typing laboratories, also by molecular markers, of individuals and animal, plant, and microbial species for food, legal, health, pharmaceutical and environmental purposes.
- Public and private scientific research and service bodies in the bio-diagnostic, biosafety, environmental and neuroscience fields.
- Creation and management of databases in the biological field.
- Biotechnology laboratories, biomedical and biotechnological industries.

- Institutes and laboratories for the evaluation of the biotic impact on the conservation of cultural heritage.
- Pharmaceutical companies as a pharmaceutical medical representative.
- Field of training and scientific dissemination.

Art. 4

Admission requirements and knowledge required for access to the Degree Program¹

Students who intend to enrol in the master's degree course in Biological Sciences (class LM-6) must be in possession of a three-year university degree or diploma or other qualification obtained abroad, recognized as suitable according to current legislation.

For direct access to the master's degree course in Biological Sciences, the student must demonstrate that they have acquired the knowledge required for the three-year degree of class L-13 (i.e. class 12 pursuant to Ministerial Decree 509).

Students coming from other degree classes must demonstrate knowledge of the BIO/, CHIM/, FIS/, MAT/ SSDs. Possession of curricular requirements is determined by having acquired a total of no less than 90 CFU in the scientific-disciplinary sectors of the BIO area as well as in the MAT/01-MAT/09, FIS/01-FIS/08 and CHIM/01-CHIM sectors /12 of which:

- at least 6 credits in courses in the scientific disciplinary sectors from MAT/01 to MAT/09
- at least 6 credits in courses in the scientific disciplinary sectors from FIS/01-FIS/08
- at least 12 credits in courses in the scientific disciplinary sectors CHIM/01, CHIM/03, CHIM/06, CHIM/12
- at least 20 credits in courses in the sectors BIO/01, BIO/02, BIO/03, BIO/05, BIO/06, BIO/07, BIO/16, BIO/17)
- at least 6 credits in courses in the BIO/09, MED/04, MED/42 sectors
- at least 20 credits in courses in the sectors BIO/04, BIO/10, BIO/11, BIO/12, BIO/13, BIO/18, BIO/19, AGR/07, MED/03, MED/07.

Students must also meet the requirements of adequate personal preparation. The methods for verifying personal preparation for access to the master's degree course in Biological Sciences are reported in the teaching regulations of the study course and published annually on the WEB site of the Department of Biology.

Art. 5

Procedures for access to the Degree Program (CdS)

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. Verification of personal preparation is always mandatory, and only students who meet the curricular requirements can access it.
3. Students who intend to enrol in the master's degree course in Biological Sciences must be in possession of a three-year university degree or diploma or other qualification obtained abroad,

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

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

recognized as suitable according to current legislation. Students must also possess the minimum curricular requirements and adequate personal preparation.

To access the master's degree course in Biological Sciences, the student must demonstrate that they have acquired the knowledge of the three-year degree of class L-13 (or class 12 ex Ministerial Decree 509) or, if coming from other degree classes, to have knowledge in the BIO/, CHIM/, FIS/, MAT/ SSDs.

Possession of curricular requirements is determined by having acquired a total of no less than 90 CFU in the scientific-disciplinary sectors of the BIO area as well as in the MAT/01-MAT/09, FIS/01-FIS/08 and CHIM/01-CHIM sectors /12, of which:

- at least 6 credits in courses in the scientific disciplinary sectors from MAT/01 to MAT/09
- at least 6 credits in courses in the scientific disciplinary sectors from FIS/01-FIS/08
- at least 12 credits in courses in the scientific disciplinary sectors CHIM/01, CHIM/03, CHIM/06, CHIM/12
- at least 20 credits in courses in the sectors BIO/01, BIO/02, BIO/03, BIO/05, BIO/06, BIO/07, BIO/16, BIO/17
- at least 6 credits in courses in the BIO/09, MED/04, MED/42 sectors
- at least 20 credits in courses in the sectors BIO/04, BIO/10, BIO/11, BIO/12, BIO/13, BIO/18, BIO/19, AGR/07, MED/03, MED/07.

The methods of verifying personal preparation for access to the master's degree course in Biological Sciences are defined year by year by the CCD and published on the WEB site of the Department of Biology.

The admission criteria are detailed at the following link:

<http://www.dipartimentodibiologia.unina.it/criteri-di-ammissione-lm-sienze-biologiche/>

Art. 6

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

Each training activity, prescribed by the CdS 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 follows ⁴:

- Lecture or guided teaching exercises: 8 hours per CFU.
- Seminar: 8 hours per CFU;
- Laboratory or field activities: 8 hours per CFU;

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."

For internship activities, each credit corresponds to 25 hours of overall training commitment⁵. The CFU corresponding to each training activity are acquired by the student by satisfying the profit verification methods (exam, suitability) indicated in the Schedule relating to the teaching/activity attached to these Regulations.

Art. 7

Description of teaching methods

The didactic activity is carried out in conventional modality. If necessary, the CCD decides which courses also include teaching activities offered online. 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.
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.

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.

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."

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

Art. 9

Degree Program structure and Study Plan

The legal duration of the Degree Program is 2 years. The student must acquire 120 CFU¹⁰, attributable to the following Types of Training Activities (TAF):

- B) characterising,
- C) related or complementary,
- D) at the student's choice¹¹,
- E) for the final exam,
- F) further training activities.

The degree is awarded after having acquired 120 CFU by passing examinations, not exceeding 12 including the final exam, 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 taken into account 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 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.

In order to acquire the CFU relating to independent choice activities as well as training activities that are not teachings, 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).

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, 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".

The student can also include internship credits in excess of those foreseen by the regulation among the credits of his choice, subject to approval by the CCD. It is possible to take elective credits even in years other than the one foreseen, as long as they do not exceed, in total, those required for the entire degree course.

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.

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, as long as they are consistent with CdS detail sheet of the academic year of enrollment. The individual study plan is approved by CCD.

To foster the development of interdisciplinary skills and the ability to operate with a systemic perspective in diverse contexts, the Degree Program promotes highly interdisciplinary training programs, called "Minor Programs" (PM). The "Minor Programs" require the acquisition of extracurricular credits (CFU) along with an appropriate selection of activities chosen by the student. The Minor Programs are associated with digital certifications, called "Open Badges."

Art. 10

Attendance requirements¹⁴

1. In general, attendance of lectures is strongly recommended but not compulsory.
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 CdS 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 and in the teaching/activity course sheet (Annex 2).
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.

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).

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

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. It remains understood that the portion of university training credits relating to the same scientific-disciplinary sector directly recognized to the student cannot be less than 50% of those already obtained. 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.

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.

1. With regard to 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, taking into account 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.

¹⁵ Art. 19 of the University Didactic Regulations.

¹⁶ Art. 19 and Art. 27, par. 6 of the University Didactic Regulations.

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

¹⁸ R.D. No. 3241/2019.

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

Article 16

Features and modalities for the final examination

The final exam aims to verify the student's ability to apply knowledge and consists of the presentation and discussion of an experimental thesis which reports the results of original research carried out on a scientific topic previously agreed with a supervisor belonging to the Degree Programme, who will supervise the activity in its different phases.

The final test for the award of the master's degree in Biological Sciences consists in the presentation and discussion by the graduating student of an experimental thesis elaborated by him/her in an original way which reports the results of original research carried out on a scientific topic previously agreed with a supervisor pertaining to the CdS, who will supervise the activity in its various phases. The thesis activity may be carried out in a university or extra-university laboratory, even in another Italian or foreign location, under the guidance of a university supervisor and a co-supervisor, in the case of extra-university research centres.

The duration in CFU of the thesis is indicated for each curriculum in the teaching table, of which, only for students who carry out the thesis abroad within an Erasmus or similar programme, 1 credit for the preparation of the presentation and the discussion of the 'elaborate.

To be admitted to the final test, the student must have obtained all the training credits required by the course's teaching regulations, excluding those reserved for the final test.

The thesis discussion will take place in the presence of a commission appointed for this purpose and may include the use of audio-visual devices.

The judging commission for the final test, established in accordance with the provisions of paragraph 7 of the art. 29 of the RDA, having verified that it has been passed, establishes the degree mark, expressed in one hundred and tenths, considering the curriculum, the thesis, and the presentation. The Commission, in the case of reaching a mark of 110/110, can assign honours with a unanimous decision.

Article 17

Guidelines for traineeship and internship

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 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.

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

²⁰ R.D. No. 3241/2019.

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

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, by the Student Internship Office (<http://www.unina.it/didattica/tirocini-studenti>), ensures 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

Loss 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.

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;

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

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.

- 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

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 (CdS structure) and Annex 2 (Teaching/Activity course sheet) are an integral part of this Didactic Regulations.

ANNEX 1.2

DEGREE PROGRAM DIDACTIC REGULATIONS

BIOLOGICAL SCIENCES

CLASS LM-6

School: Polytechnic of Basic Sciences

Department: Biology

Didactic Regulations in force since the academic year 26 - 27

STUDY PLAN

KEY

Type of Educational Activity (TAF):

B = Characterising

C = Related or Supplementary

D = At the student's choice

E = Final examination and language knowledge

F = Further training activities

Year I									
Curriculum <i>BIOLOGY APPLIED TO DIAGNOSIS AND BIOMEDICAL RESEARCH</i>									
Title Course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Molecular genetics for biomedical diagnostics	BIOS-14/A	Single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Molecular physiology	BIOS-06/A	Single	8	64	Frontal lesson	In-person	C	Related or supplementary	Mandatory
Plant secondary metabolites and biological activity	BIOS-01/A	Single	6	48	Frontal lesson	In-person	B	Biodiversity and environment	Mandatory
English language laboratory 2	LIN/12	Single	4	32	Frontal lesson	In-person	F	Further linguistic knowledge	Mandatory
Molecular microbiology and virology	BIOS-15/A	Single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Hygiene and Health Epidemiology	MEDS-24B	Single	6	48	Frontal lesson	In-person	C	Related or supplementary	Mandatory
Integrated Hematology: Diagnostics and Research	BIOS-04A	Single	6	48	Frontal lesson	In-person	B	Biodiversity and environment	Mandatory
At the student's choice activity		Single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
Further knowledge useful for job placement			6	150		In-person / By distance	F	Further training activities	Mandatory

Year II									
Curriculum BIOLOGY APPLIED TO DIAGNOSIS AND BIOMEDICAL RESEARCH									
Title Course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Biochemical methodologies in biomedical diagnostics and research	BIOS-07/A	Single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Molecular pathogenesis of human diseases	MEDS-02/A	Single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
Physioendocrinology of Integrated Systems	BIOS-06/A	Single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
Thesis activity			36	900			E	For the final test	Mandatory

Year I									
Curriculum ENVIRONMENTAL BIOLOGY									
Title Course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Morphofunctional diversity of plants	BIOS-01/A	Single	6	48	Frontal lesson	In-person	B	Biodiversity and environment	Mandatory
Eco-physiological adaptations of plants	BIOS-02/A	Single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Environmental hygiene	MEDS-24/B	Single	8	64	Frontal lesson	In-person	B	Biomedical	Mandatory
English language laboratory 2	LIN/12	Single	4	32	Frontal lesson	In-person	F	Further linguistic knowledge	Mandatory
Phyto-monitoring and environmental restoration	BIOS-01/C	Single	8	64	Frontal lesson	In-person	B	Biodiversity and environment	Mandatory
Microbiology applied to the environment	BIOS-15/A	Single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Conservation and Restoration of Degraded Environments	BIOS-05/A	Single	8	64	Frontal lesson	In-person	B	Biodiversity and environment	Mandatory
At the student's choice activity		Single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
Further knowledge useful for job placement			6	150		In-person / By distance	F	Further training activities	Mandatory

Year II									
Curriculum ENVIRONMENTAL BIOLOGY									
Title Course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Related or complementary activity 1 (chosen from those in Table A)		Single	6	48	Frontal lesson	In-person	C	Related or supplementary	Mandatory

Title Course	SSD	Module	CREDITS	Hours	Type Activities (lectures, workshops, etc.)	Course Modalities (in-person, by distance)	TAF	Disciplinary area	Mandatory / optional
Systems Neurobiology	BIOS-06/A	Single	8	64	Frontal lesson	In-person	B	Biomedical	Mandatory
Neurogenetics	BIOS-14/A	Single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Neuroactive molecules and methodological approaches	BIOS-07/A	Single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
Thesis activity			36	900			E	For the final test	Mandatory

ANNEX 2.1

DEGREE PROGRAM DIDACTIC REGULATIONS BIOLOGICAL SCIENCES

CLASS LM-6

School: Polytechnic of Basic Sciences

Department: Biology

Regulations in force from a.y. 2026/2027

Curriculum in BIOLOGY APPLIED TO DIAGNOSIS AND BIOMEDICAL RESEARCH

Course: Molecular microbiology and virology		Teaching language: Italian	
SSD: BIOS-15/A		CFU: 8	
Course year: first		Type of Educational Activity: B - characterizing	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Natural distribution of microorganisms, including viruses. Role of microorganisms in the host or environment. Use and manipulation of microorganisms for applied and biotechnological purposes.			
Objectives: The course aims to provide students with the knowledge to critically evaluate the impact of the spread, manipulation, and emergence of "old" and "new" microorganisms on human health and society. Through the study of the molecular characteristics of bacteria and viruses, students will be able to understand and describe the main antiviral and antibacterial prophylaxis and therapy strategies, with particular reference to common or current diseases. Students will also be able to confidently illustrate and discuss the main investigative techniques used in basic research and microbiological diagnostics.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Written and oral exam			

Course: Hygiene and Health Epidemiology		Teaching language: Italian	
SSD: MEDS-24/B			CFU: 6
Course year: first		Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence			

Contents extracted from the SSD declaratory consistent with the training objectives of the course: Scientific and educational activities, appropriate in the fields of general and applied hygiene, preventive medicine, public health, territorial healthcare organization, and the assessment of health needs and health policies and strategies.	
Objectives: The course provides knowledge regarding the purposes of hygiene and epidemiology, data collection in epidemiology applied to diagnostics, methods for measuring population health status and basics of public health, and types of epidemiological studies aimed at assessing human health risks and the related primary, secondary, and tertiary prevention.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Written and oral exam	

Course: Molecular genetics for biomedical diagnostics		Teaching language: Italian
SSD: BIOS-14/A		CFU: 8
Course year: first	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 defines and analyzes the structure of genetic material and its levels of organization in microbial, plant, and animal systems, including humans. It studies epigenetic modifications, analyzing their molecular bases. It investigates the genetic and molecular bases of evolution, development, immune response, hereditary diseases, and the practical applications of genetics and its derived molecular technologies, such as genetic engineering and transgenesis, in the biomedical and pharmaceutical sectors.		
Objectives: The aim of the course is to impart specialized knowledge and skills on the molecular basis of heredity. Students will acquire knowledge and skills in the use of the main molecular genetics and cytogenetics techniques, in the analysis of DNA and genomes, and in the interpretation of genetic data. They will be able to integrate knowledge and skills for applications in biomedical research and diagnostics, understanding the role of molecular mechanisms and epigenetic modifications in gene regulation.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Integrated Hematology: Diagnostics and Research		Teaching language: Italian
SSD: BIOS-04/A		CFU: 6
Course year: first	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 disciplines included in this field represent an integrated set of skills aimed at studying form in animal biology at different levels of organization, from both a structural and embryological-evolutionary perspective. In this context, the course in Hematology Applied to Diagnostics contributes to the analysis of the structural, cellular, and subcellular characteristics of blood cells and hematopoietic tissues, with particular reference to their functions and processes of differentiation and maturation. The course falls within the core disciplines of the field, as it uses approaches and methodologies from cell biology, cytology, and animal histology to study hematopoiesis and the immunohematological system. Consistent with the field's embryological-evolutionary perspective, the fundamentals of developmental biology are also invoked to interpret the morphological bases of physiological variations and pathological alterations of blood cells, which are relevant for diagnostic purposes.		

Objectives: The course provides basic knowledge of human hematology, with particular emphasis on the laboratory and molecular aspects of major hematological diseases. Upon completion of the course, students will be able to critically interpret basic blood count, blood chemistry, and biomolecular data, correlating them with the pathophysiological patterns of blood and hematopoietic organ diseases. The course contributes to the development of independent judgment, scientific communication skills, and the ability to continuously update their knowledge, consistent with the educational objectives of the curriculum in Biology Applied to Diagnostics and Biomedical Research.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Biochemical methodologies in biomedical diagnostics and research	Teaching language: Italian
SSD: BIOS-07/A	CFU: 8
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: Biochemical methodologies for the identification and structural and functional characterization of biomolecules. Recombinant molecular and omics technologies (e.g., genomics, transcriptomics, proteomics, metabolomics) for the study of macromolecules and biological processes. Biochemical specificities of cells, tissues, and organs.	
Objectives: The student will demonstrate the ability to choose between different methodologies, both in diagnostics and research, indicating any modifications to traditional tests or designing innovative tests for the measurement and identification of biomarkers.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Molecular pathogenesis of human diseases	Teaching language: Italian
SSD: MEDS-02/A	CFU: 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: General pathology and general pathophysiology; basic and applied research including the study of cellular pathology with specific expertise in oncology, immunology, immunopathology, and genetic pathology.	
Objectives: The course aims to provide students with the elements to understand and analyze the molecular pathogenesis of human diseases, useful for understanding the theoretical bases of molecular diagnostics.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Physioendocrinology of Integrated Systems		Teaching language: Italian	
SSD: BIOS-06/A		CFU: 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: Physiology studies the vital functions of animals and humans, including comparative studies, examining physiological mechanisms at all levels of complexity—molecular, cellular, and systemic. It analyzes and evaluates the integrated functioning of various organs and systems.			
Objectives: The course aims to provide students with advanced knowledge of the role of hormones in regulating the integrated functioning of various human organs and systems and in homeostatic control. Students will be guided toward developing integrated specialized skills related to the biomedical field.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Plant secondary metabolites and biological activity		Teaching language: Italian
SSD: BIOS-01/A		CFU: 6
Course year: first	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 studies plant biology at all levels of organization, including autotrophic prokaryotes, algae, and fungi and their symbioses, to interpret their structures and reproductive mechanisms, including from an evolutionary perspective. It explores the ways in which cells and tissues specialize to form complex organisms; it highlights the basis of embryogenesis and organogenesis and the relationships between cytological, histological, morphophysiological, and molecular aspects, and the role of secondary metabolites in the developmental environment of plants. It also studies biotechnological methods used for relevant investigations.		
Objectives: Acquire an in-depth knowledge of the main secondary metabolites produced by plants and understand their function and biological activity in the context of their potential applications.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Molecular physiology		Teaching language: Italian	
SSD: BIOS-06/A		CFU: 6	
Course year: first		Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes physiological mechanisms at all levels of complexity: molecular, cellular, and systemic. It studies the biophysical, molecular, and functional mechanisms of transport and communication systems in biological membranes, the general mechanisms of cellular physiology, as well as the specialized functions of individual cells and their responses to environmental changes and stresses.			
Objectives: The course aims to provide students with advanced knowledge of the molecular mechanisms implemented by cells to			

maintain homeostasis, communicate, and respond to stimuli, as well as the consequences that may arise from alterations in these mechanisms.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Oral exam

Curriculum in ENVIRONMENTAL BIOLOGY

Course: Morphofunctional diversity of plants	Teaching language: Italian
SSD: BIOS-01/A	CFU: 6
Course year: first	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 studies plant biology at all levels of organization, including autotrophic prokaryotes, algae, and fungi and their symbioses, to interpret their structures and reproductive mechanisms, including from an evolutionary perspective. It explores the ways in which cells and tissues specialize to form complex organisms; it highlights the basis of embryogenesis and organogenesis and the relationships between cytological, histological, morphophysiological, and molecular aspects, and the role of secondary metabolites in the developmental environment of plants. It also studies biotechnological methods used for relevant investigations.	
Objectives: Acquire in-depth knowledge of the morpho-anatomical and reproductive adaptations of plants in relation to the biotic and abiotic environment and be able to interpret them on the basis of evolutionary relationships.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Eco-physiological adaptations of plants	Teaching language: Italian
SSD: BIOS-02/A	CFU: 6
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Eco-physiological Adaptations of Plants: The course includes the study of the functions and vital mechanisms of plant organisms. This area therefore includes knowledge of plant physiology, morphophysiology, ecophysiology, biochemistry, and photobiology. The study of growth regulators and secondary metabolism, with respect to the metabolites involved in plant adaptation to the environment, is particularly relevant to the teaching. The area includes both disciplines describing the basic mechanisms of plant function and disciplines addressing applied aspects, such as the mechanisms underlying the control of plant productivity and resistance to biotic and abiotic stress.	
Objectives: The primary objective of this course is to acquire in-depth knowledge of the interactions between environmental and biotic factors and plants, and of the adaptation capabilities of plants to their environment.	
Entry requirements: None	
Exit requirements: None	

Types of examinations and other tests: Written and oral exam
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Course: Environmental hygiene	Teaching language: Italian
SSD: MEDS-24/B	CFU: 8
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Scientific and educational activities, appropriate in the fields of general and applied hygiene, preventive medicine, public health, territorial healthcare organization, and the assessment of health needs and health policies and strategies.	
Objectives: Students must demonstrate knowledge of the objectives and purposes of hygiene, human health risk assessment, and epidemiology, methods for data collection in epidemiology, risk prevention and mitigation, the study of environmental substrates, methods for measuring population health, the main models of epidemiological studies, and the main regulations aimed at protecting human health and the environment. Solid and liquid waste, water intended for human consumption, noise, and microclimate.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Phyto-monitoring and environmental restoration	Teaching language: Italian
SSD: BIOS-01/C	CFU: 8
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of plant-environment interactions. Additional areas of interest include the botanical aspects of biodiversity analysis, conservation biology, environmental planning, monitoring, and environmental impact assessments, including those related to global change.	
Objectives: The course provides theoretical and practical skills for using plants as biomonitors of air, water, and soil quality and for designing phytoremediation interventions.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Animal bioindicators and monitoring	Teaching language: Italian
SSD: BIOS-03A	CFU: 6
Course year: first	Type of Educational Activity: C - related or supplementary
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of metazoans at the population, species, and community levels, with particular emphasis on animal biodiversity and interactions with the environment. Behavioral analysis of animal responses to anthropogenic pressures. Application of theoretical and experimental approaches, in the field and laboratory, for wildlife monitoring. Use of bioindication in assessing ecosystem quality and managing biodiversity.	

Objectives: Provide theoretical and practical knowledge on the use of animals as environmental bioindicators. Develop the ability to assess the effects of human activities on wildlife populations and communities. Acquire basic skills in wildlife monitoring techniques and biological data interpretation. Integrate zoological knowledge into environmental assessment, conservation, and management processes.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Written and oral exam	

Course: Conservation and Restoration of Degraded Environments		Teaching language: Italian
SSD: BIOS-05/A		CFU: 8
Course year: first	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 course addresses the following applied aspects: ecosystem conservation and management, use of strategies for maintaining biodiversity, environmental impact assessment, and ecological aspects of environmental restoration.		
Objectives: The course aims to develop critical and operational skills for analyzing, planning, and evaluating rigorous experimental designs, protocols, and best practices to support biodiversity conservation and restoration interventions in degraded environments. The analysis of both successful and unsuccessful case studies develops skills needed to design effective and sustainable interventions, which are essential for protecting biodiversity in a context of increasing anthropogenic pressures and climate change. Through the integration of theoretical foundations, case studies, and regulatory frameworks, students will acquire a systemic vision for ecosystem management in a context of climate change and anthropogenic pressures.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Plant Ecology		Teaching language: Italian	
SSD: BIOS-01/C		CFU: 6	
Course year: second		Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The course explores the distribution and adaptive strategies of autotrophic organisms, as well as their ways of using resources and their interrelationships with the environment. The analysis of these topics is aimed at studying ecological complexity, biodiversity conservation, and the environmentally sustainable management of natural resources, including in relation to global change.			
Objectives: Study of the role of plant organisms in the ecosystem and their relationships with the biotic and abiotic environment.			
Entry requirements: Botany, Ecology and Plant Physiology			
Exit requirements: None			
Types of examinations and other tests: Written and oral exam			

Course: Cellular Plasticity and the Environment	Teaching language: Italian
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SSD: BIOS-04/A		CFU: 6
Course year: second	Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in this field represent an integrated set of skills that address the problem of form in animal biology, at its various levels of organization and from both a structural and embryological-evolutionary perspective. From a structural perspective, the fundamental correlations between the molecular, cellular, tissue, and organological levels are explored. From an embryological-evolutionary perspective, the relationships between phylogeny and morphogenesis are studied to identify, also through a comparative approach, the interconnection between structure, function, and adaptation. The field encompasses the core disciplines of vertebrate developmental and evolutionary biology, comparative anatomy, cell biology, animal cytology, and histology.		
Objectives: The aim of the course is to introduce and explore the relationship between environment, development, and evolution through an "eco-evo-devo" approach. The course aims to provide specialized knowledge on the theoretical, methodological, and practical aspects of cellular adaptation mechanisms in relation to environmental conditions.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Environmental metagenomics		Teaching language: Italian
SSD: BIOS-14/A		CFU: 8
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: Analyzes the structure of genetic material and its levels of organization in microbial, plant, and animal systems. Practical applications of genetics and derived molecular technologies, including genetic engineering, in the biomedical, pharmaceutical, agri-food, industrial, and environmental sectors. Uses the field of computational and systems biology applied to genetics and genomics with bioinformatics tools.		
Objectives: The course aims to provide students with the theoretical knowledge necessary to understand genetic principles applied to the study of environmental DNA (eDNA). Specifically, the course aims to provide the theoretical and methodological foundations of metabarcoding, from sample collection to the analysis and interpretation of genetic data. Furthermore, the course aims to develop the ability to interpret genomic data derived from metabarcoding analyses and promote a critical approach to the use of environmental genomics tools in scientific research and ecosystem management.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Microbiology applied to the environment		Teaching language: Italian	
SSD: BIOS-15A		CFU: 6	
Course year: first		Type of Educational Activity: B - characterizing	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Natural distribution of microorganisms. Role of microorganisms in the environment. Use and manipulation of microorganisms for applied and biotechnological purposes.			
Objectives: The course aims to provide students with a solid foundation in the use of microorganisms in the environment and for the protection of environmental quality. The primary objective of the training program is to provide students with the			

methodological tools necessary to understand and exploit the metabolic capabilities of microorganisms in environmental bioremediation processes.
Entry requirements: None Exit requirements: None
Types of examinations and other tests: Written and oral exam

Curriculum in BIOSAFETY, QUALITY AND HEALTH PROTECTION

Course: Ecotoxicology	Teaching language: Italian
SSD: BIOS-05/A	CFU: 8
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 Ecotoxicology course addresses the study of the effects of various contaminants released by humans into the environment on organisms, populations, and biological communities, with particular emphasis on the effects of pollutants on natural and human-induced ecosystems.	
Objectives: The course provides advanced knowledge of the processes of contaminant release into the environment and their interaction mechanisms, considering both the action of individual contaminants and their combined effects (cocktail effects) at different levels of biological organization (individuals, populations, communities, and ecosystems). Students will be able to interpret ecotoxicological data, assess ecological risk, and understand the environmental implications of pollution.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Molecular traceability of plants	Teaching language: Italian
SSD: BIOS-01/A	CFU: 6
Course year: first	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 studies plant biology at all levels of organization, including autotrophic prokaryotes, algae, and fungi and their symbioses, to interpret their structures and reproductive mechanisms, including from an evolutionary perspective. It explores the ways in which cells and tissues specialize to form complex organisms; it highlights the basis of embryogenesis and organogenesis and the relationships between cytological, histological, morphophysiological, and molecular aspects, and the role of secondary metabolites in the developmental environment of plants. It also studies the biotechnological methods used for relevant investigations.	
Objectives: The course aims to illustrate the theoretical, methodological, and experimental aspects of the use of molecular markers for the traceability of plant organisms and their derivatives.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Written and oral exam	

Course: Synanthropic Zoology		Teaching language: Italian	
SSD: BIOS-03A		CFU: 6	
Course year: first		Type of Educational Activity: B - characterizing	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of metazoans and their evolution at the population, species, and community levels. Research conducted using theoretical and experimental methodologies to investigate intra- and interspecific interactions and interactions with the environment. Zoology, the science that characterizes the sector, is a core discipline in the life sciences, also in reference to environmental education and wildlife management and conservation.			
Objectives: Knowledge of animal species that can complete their life cycle in a human (urban) environment and the level of risk associated with them.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Biosafety for human and animal health		Teaching language: Italian
SSD: MVET-02/A		CFU: 6
Course year: second	Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector encompasses disciplines and research topics related to the etiopathogenesis of diseases, biotechnologies aimed at the etiopathogenetic study of nosological entities in pets, livestock, wild animals, and laboratory animals, also included in the fields of ichthyopathology, environmental pathology, and teratology.		
Objectives: The course aims to provide knowledge of the basic principles of pathology, parasite biology, and microbiology for improving health surveillance programs, with legislative reference to national and international institutions such as the FAO, the World Health Organization (WHO), UNEP, and the World Organization for Animal Health (WOAH). The course will also provide basic knowledge of the main health issues at the human/animal/environment interface.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Hygiene and risk management in companies		Teaching language: Italian
SSD: MEDS-24/B		CFU: 6
Course year: first	Type of Educational Activity: B - characterizing	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Scientific and educational-training activities, appropriate in the fields of general and applied hygiene, preventive medicine, public health, territorial health organization and the assessment of health needs and health policies and strategies.		
Objectives: Students must demonstrate knowledge of the objectives and purposes of hygiene, human health risk assessment, and epidemiology, methods for data collection in epidemiology, risk prevention and mitigation, and the main regulations		

aimed at protecting human health in the workplace and the matrices with which workers come into contact, with particular reference to food hygiene.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Microbiology applied to biosafety	Teaching language: Italian
SSD: BIOS-15/A	CFU: 6
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Scientific and educational-training activities, appropriate in the fields of general and applied hygiene, preventive medicine, public health, territorial health organization and the assessment of health needs and health policies and strategies.	
Objectives: Students must demonstrate knowledge of the objectives and purposes of hygiene, human health risk assessment, and epidemiology, methods for data collection in epidemiology, risk prevention and mitigation, and the main regulations aimed at protecting human health in the workplace and the matrices with which workers come into contact, with particular reference to food hygiene.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Written and oral exam	

Course: Biochemical basis of toxicology	Teaching language: Italian
SSD: BIO-07/A	CFU: 8
Course year: second	Type of Educational Activity: C - related or supplementary
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biological processes at the molecular level, the structure, properties, and functions of biomolecules, including proteins, enzymatic catalysis, and the biochemical mechanisms underlying the functions of prokaryotic, plant, animal, and human cells; enzymology, molecular structural biology, biocrystallography, biophysics, computational biochemistry, and bioinformatics; recombinant molecular technologies for protein engineering.	
Objectives: The aim of the course is to provide students with knowledge of how toxic substances (toxins, drugs, pollutants, xenobiotics) interact with major biological macromolecules (proteins, nucleic acids, lipid membranes), altering their structure and function and thus causing harmful effects on cells, tissues, or the organism as a whole.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Molecular genetics applied to safety, health and prevention	Teaching language: Italian
SSD: BIOS-14/A	CFU: 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: Studies of the regulation of gene expression and the mechanisms of mutagenesis. Studies of epigenetic modifications, analyzing their molecular basis, inheritance, and phenotypic consequences.
Objectives: The aim of the course is to provide students with the genetic and genomic knowledge necessary to assess biological, chemical, and environmental risk in the workplace, in industrial production, and in product safety, with particular reference to the genotoxic, mutagenic, and epigenetic effects of exposure agents.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Human pathology due to occupational and polluting causes	Teaching language: Italian	
SSD: MEDS-02/A		CFU: 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: General pathology and general pathophysiology; basic and applied research including the study of cellular pathology with specific expertise in oncology, immunology, immunopathology, and genetic pathology.		
Objectives: The course aims to provide students with knowledge of the main causes of environmental diseases, with particular attention to diseases caused by exposure to environmental and occupational agents.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Physiology of well-being in the work environment		Teaching language: Italian	
SSD: BIOS-06/A		CFU: 6	
Course year: second		Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes the vital functions of animals and humans, including comparative studies, studying physiological mechanisms at all levels of complexity—molecular, cellular, and systemic. It studies the general mechanisms of cellular physiology, as well as the specialized functions of individual cells and their responses to environmental changes and stress. It explores the potential applications of this knowledge in the environmental, biotechnological, and medical fields, including those aimed at human well-being.			
Objectives: The Physiology of Well-Being in the Workplace course aims to provide students with the tools necessary to acquire knowledge regarding the relationship between body homeostasis and well-being, with reference to cellular/tissue responses to factors and stressors in the work environment			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Curriculum in NEUROSCIENZE

Course: Molecular physiology		Teaching language: Italian	
SSD: BIOS-06/A		CFU: 8	
Course year: first		Type of Educational Activity: C - related or supplementary	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes physiological mechanisms at all levels of complexity: molecular, cellular, and systemic. It studies the biophysical, molecular, and functional mechanisms of transport and communication systems in biological membranes, the general mechanisms of cellular physiology, as well as the specialized functions of individual cells and their responses to environmental changes and stresses.			
Objectives: The course aims to provide students with advanced knowledge of the molecular mechanisms implemented by cells to maintain homeostasis, communicate, and respond to stimuli, as well as the consequences that may arise from alterations in these mechanisms.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Cytology and histology of the nervous system		Teaching language: Italian
SSD: BIOS-04/A		CFU: 8
Course year: first	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 area focuses on scientific and educational activities in disciplines characterized by an integrated set of skills that, from a regulatory and evolutionary perspective, address development and form in animal biology, from both a morpho-functional and embryological-evolutionary perspective. From a morpho-functional perspective, the fundamental correlations between the molecular, subcellular, cellular, tissue, and organological levels are explored, employing advanced techniques in cytology and tissue, cell and developmental biology, karyology, and cytotoxicology, including potential applications in biotechnology. The department's areas of interest include comparative anatomy, cell biology, developmental and evolutionary biology of vertebrates, animal cytology and histology, comparative neurobiology, comparative endocrinology, and comparative immunology.		
Objectives: The course aims to provide students with specialist knowledge of cytology and histology of the nervous system.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Neuroethology		Teaching language: Italian	
SSD: BIOS-03A		CFU: 6	
Course year: first	Type of Educational Activity: B - characterizing		
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of metazoans and their evolution at the population, species, and community levels. Research conducted using theoretical and experimental methodologies to investigate intra- and interspecific interactions and interactions with the environment. Zoology, the science that characterizes the sector, is a core discipline in the life sciences, also in reference to environmental education and wildlife management and conservation.			

Objectives: Understanding the neural basis of animal behavior through an integrated approach between neuroscience and ethology. Understanding the main behavioral patterns and analyzing an organism's sensorimotor systems in innate and learned behaviors.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Written and oral exam

Course: Cellular neurophysiology	Teaching language: Italian
SSD: BIOS-06/A	CFU: 8
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes physiological mechanisms at all levels of complexity: molecular, cellular, and systemic. It studies the biophysical, molecular, and functional mechanisms of transport and communication systems in biological membranes, the general mechanisms of cellular physiology, as well as the specialized functions of individual cells and their responses to environmental changes and stresses.	
Objectives: The Cellular Neurophysiology course aims to provide students with advanced knowledge regarding the physiology of neurons, the biophysical characteristics of neuronal membranes, the mechanisms that regulate nervous activity and the metabolism of cells of the nervous system, as well as the basic methodological tools necessary to work in the field of cellular neurophysiology.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Stem cells in the study of the nervous system	Teaching language: Italian
SSD: BIOS-10/A	CFU: 6
Course year: first	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 course falls within the scope of cellular and applied biology and provides an advanced understanding of the cellular and molecular mechanisms that regulate the transmission and control of genetic and epigenetic information in the specification, differentiation, and proliferation of central nervous system (CNS) stem cells. Particular attention is paid to the study of the microenvironments in which CNS stem cells reside, understood as functional niches involved in the processes of neurogenesis, development, and remodeling of nervous tissue, as well as the mechanisms of cellular communication and interaction. The learning path focuses on the use of in vitro and ex vivo experimental models and advanced biological technologies, aimed at studying the cellular and molecular mechanisms underlying the differentiation, damage, and aging of neuronal cells, which are relevant to the pathophysiology of the central nervous system.	
Objectives: The course aims to provide students with advanced knowledge of the cellular and molecular mechanisms underlying the specification and differentiation processes of neural stem cells, using in vitro and ex vivo experimental models. Students will acquire the conceptual and methodological tools necessary to understand how these processes contribute to the physiology and pathophysiology of the central nervous system.	
Entry requirements: None	
Exit requirements: None	

Types of examinations and other tests: Written and oral exam
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Course: Microbiota and Nervous System	Teaching language: Italian
SSD: BIOS-15A	CFU: 6
Course year: first	Type of Educational Activity: B - characterizing
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Natural distribution of microorganisms. Role of microorganisms in the environment. Use and manipulation of microorganisms for applied and biotechnological purposes.	
Objectives: The course aims to provide advanced knowledge of how microorganisms establish relationships with their hosts, both beneficial and pathological, with particular emphasis on the molecular mechanisms underlying the gut-brain relationship.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Systems Neurobiology	Teaching language: Italian
SSD: BIOS-06/A	CFU: 8
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: Physiology studies physiological mechanisms at all levels of complexity—molecular, cellular, and systemic—as well as the mechanisms of vegetative and interpersonal life and their interrelationships.	
Objectives: The course aims to provide students with in-depth knowledge of the higher functions of the Central and Peripheral Nervous Systems. The course also aims to enable students to extend their study methodology to any structural, functional, and molecular aspect of the Nervous System.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Neurogenetics	Teaching language: Italian
SSD: BIOS-14A	CFU: 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: Studies the transmission, modification, and expression of hereditary traits at the individual and population level. She studies epigenetic modifications, analyzing their molecular bases, inheritance, and phenotypic consequences. She studies the regulation of gene expression.	
Objectives: The course aims to provide students with the theoretical knowledge necessary to understand the genetic basis of inherited human neurodegenerative diseases, both simple and complex, the methodological tools for molecular diagnosis, and the fundamentals for the functional characterization of genes responsible for a pathological phenotype.	

Entry requirements: None Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Neuroactive molecules and methodological approaches	Teaching language: Italian
SSD: BIOS-07/A	CFU: 6
Course year: second	Type of Educational Activity: C - related or supplementary
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biological processes at the molecular level, the structure, properties, and functions of biomolecules, including proteins, enzymatic catalysis, and the biochemical mechanisms underlying the functions of prokaryotic, plant, animal, and human cells; enzymology, molecular structural biology, biocrystallography, biophysics, computational biochemistry, and bioinformatics; recombinant molecular technologies for protein engineering.	
Objectives: The course provides basic and advanced biochemical knowledge of neuroactive molecules and their mechanisms of action in the nervous system, as well as the main methodological approaches used to study them. Upon completion of the course, students will be able to understand and interpret the molecular processes involving neuroactive molecules, both natural and synthetic, and the related experimental data.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

At Student's choice courses

Course: Molecular basis of aging and neurodegenerative diseases	Teaching language: Italian
SSD: BIOS-08/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: This field of interest focuses on the analysis of the biochemical and evolutionary characteristics of nucleic acids, the interactions between nucleic acids and proteins, and between proteins and proteins, and the relationships between the three-dimensional structure of proteins and nucleic acids and the biological functions they perform in eukaryotes. Particular attention is paid to the macromolecules involved in the transcription and translation of the information contained in nucleic acids, and to the macromolecules responsible for the control of gene expression.	
Objectives: Provide advanced expertise on the molecular aspects of brain aging and neurodegenerative diseases, as well as the mechanisms shared by these phenomena, focusing on the processes regulating the transcription and translation of genetic information. The course will also explore molecular principles and strategies for diagnostics and therapeutic treatment.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Computational biochemistry in diagnostics	Teaching language: Italian
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SSD: BIOS-07/A		CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biological processes at the molecular level; molecular and regulatory mechanisms of biotransformations, enzyme catalysis, gene expression and regulation, signal transduction, intracellular and intercellular communication; growth, differentiation, apoptosis; computational biochemistry and bioinformatics.		
Objectives: The course aims to provide students with in-depth knowledge that will enable them to use NGS data for in silico profiling of biochemical phenotypes, with particular attention to the structural and functional characterization of gene variants.		
Entry requirements: Biochemistry, Molecular Biology.		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Plant bioindicators		Teaching language: Italian	
SSD: BIOS-01/C		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Definition of environmental quality, nature conservation, environmental impact assessment, environmental education aimed at studying ecological complexity and the sustainable management and monitoring of natural resources.			
Objectives: The main objective of this course is to enable the acquisition of knowledge on plants as bioindicators of environmental quality.			
Entry requirements: Botany and laboratory			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Molecular and cellular biology of the retina		Teaching language: Italian
SSD: BIOS-08/A		CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: This field of interest focuses on the analysis of the biochemical characteristics of nucleic acids, the interactions between nucleic acids and proteins, and between proteins and proteins, and the relationships between the three-dimensional structure of proteins and nucleic acids and their biological functions. Particular attention is paid to the macromolecules responsible for controlling gene expression, proliferation, differentiation, and development of animal organisms.		
Objectives: Provide advanced skills in the genetic and molecular aspects of retinal development, maintenance, and function, focusing on the molecular mechanisms underlying these processes. The course will also explore principles and advanced molecular strategies for the diagnosis and therapeutic treatment of retinal neurodegenerative diseases.		
Entry requirements: None		
Exit requirements: None		

Types of examinations and other tests: Oral exam
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Course: Environmental Botany and Global Change	Teaching language: Italian
SSD: BIOS-01/C	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Definition of environmental quality, nature conservation, environmental impact assessment, and environmental education aimed at studying ecological complexity and the sustainable management and monitoring of natural resources.	
Objectives: The course examines environmental quality and the state of degradation of the plant component of terrestrial habitats, especially in relation to global change. Natural and anthropogenic disturbances of degradation will be analyzed to identify mitigation strategies and define projects for the restoration of degraded environments.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Written and oral exam	

Course: Cytochemistry and histochemistry	Teaching language: Italian
SSD: BIOS-04/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: This field addresses the problem of form in animal biology, at its various levels of organization, from both a morphological-functional and embryological-evolutionary perspective. From a structural perspective, the fundamental correlations between the molecular, cellular, tissue, and organological levels are explored, employing advanced techniques: microscopic, cytochemical, immunohistochemical, karyological, and cytotoxicological, including the potential applications of biotechnology and the modifications caused by environmental changes. Among the disciplines characterizing this field are animal cytology and histology and cell biology.	
Objectives: The course aims to prepare students for the study of cells and tissues and provide specialized knowledge of cyto/histochemical staining and the main techniques for in situ molecular detection for application in cytodiagnosics and research.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Comparative hematology	Teaching language: Italian
SSD: BIOS-04/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the sector represent an integrated set of skills that address the problem of form in animal biology, at its various levels of organization and from both a structural and embryological-evolutionary perspective. The sector encompasses vertebrate developmental and evolutionary biology, comparative anatomy, cell biology,	

animal cytology and histology, as its core disciplines.
Objectives: The course provides basic knowledge of animal hematology, with particular emphasis on the laboratory aspects of sampling techniques, preparation, and study of blood and hematopoietic tissue samples in various vertebrate classes, from fish to mammals. This course also includes the ability to interpret complete blood count results to assess animal health.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Written and oral exam

Course: Endocrinology applied to narcotic substances		Teaching language: Italian
SSD: BIOS-04/A		CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in this field represent an integrated set of skills that address the problem of form in animal biology, from a structural and embryological-evolutionary perspective. The fundamental correlations between the molecular, cellular, tissue, and organological levels, and the modifications caused by environmental changes, are explored in depth. The interconnection between structure, function, and adaptation is studied using a comparative approach in various processes such as endocrine and neural integration, reproduction, development, and immune defense.		
Objectives: The course offers the study of: 1) the role of drugs in human history; 2) their characteristics and effects on the endocrine and nervous systems, and on peripheral organs and tissues; 3) the role of drugs as environmental contaminants, and the effects they have on the environment and on the animals that come into contact with them.		
Entry requirements: None		
Exit requirements: None		
Types of examinations and other tests: Oral exam		

Course: Comparative endocrinology		Teaching language: Italian
SSD: BIOS-04/A		CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines in this field are an integrated set of skills and address the study of form in animal biology, at its various levels of organization and from both a structural and embryological-evolutionary perspective. They explore the fundamental correlations between the molecular, cellular, tissue, and organological levels, including the modifications caused by environmental changes. From an embryological-evolutionary perspective, the relationships between phylogeny and morphogenesis are studied to identify, at various levels, also 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.		
Objectives: The training program will provide students with the appropriate tools to understand the relationships mediated by the endocrine system between different anatomical and functional regions and between these regions and the environment. The course will explore the evolutionary processes that have led to modifications of the endocrine system in different vertebrate classes.		

Entry requirements: None Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Exercise Physiology	Teaching language: Italian
SSD: BIOS-06/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes the integrated functioning of various organs and systems during physical activity and studies the potential applications of this knowledge in the sports field.	
Objectives: The course aims to provide knowledge on metabolic and organ and system adaptations in response to physical exercise, both from the perspective of each individual organ and system and as an integrative response.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Endocrine pathophysiology of nutrition	Teaching language: Italian
SSD: BIOS-06/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the general foundations of endocrinology and evaluates the nutritional characteristics of foods, nutritional status, energy expenditure and needs, and the physiological use of nutrients in the diet.	
Objectives: The course aims to provide students with in-depth knowledge of the higher functions of Endocrine Pathophysiology of Nutrition, with particular reference to the diseases associated with metabolic syndrome: obesity, diabetes, lentiginos and insulin resistance, hepatic steatosis, and endoplasmic reticulum stress.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Bioinformatics Laboratory	Teaching language: Italian
SSD: BIOS-07/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biological processes at the molecular level, the structure, properties, and functions of biomolecules, including proteins and nucleic acids; molecular and regulatory mechanisms of gene expression and regulation, signal transduction, and intracellular and intercellular communication; biochemical mechanisms of cell function; molecular structural biology, computational biochemistry, and bioinformatics.	

Objectives: The course aims to provide students with in-depth knowledge that will enable them to be independent and aware in the planning, execution, and interpretation of bioinformatics analyses, with particular attention to the ability to communicate the results outside their own scientific context.
Entry requirements: Biochemistry, Molecular Biology.
Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Photobiology and Biochemistry of Photosynthesis	Teaching language: Italian
SSD: BIOS-02/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of the biochemical and molecular functions and mechanisms of plant metabolism, particularly photobiology and the bioenergetics of photosynthesis.	
Objectives: Students must understand the evolutionary and biochemical mechanisms underlying the origin of chloroplasts in photosynthetic organisms, both green and red. Students must be familiar with the most common experimental approaches and modern technologies used in the field of plant biochemistry in photosynthetic organisms.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Hygiene, environment and health	Teaching language: Italian
SSD: MEDS-24/B	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector is concerned with scientific and educational activities in the fields of general and applied hygiene, preventive medicine, public health, health needs assessment, and health policies and strategies.	
Objectives: The course provides knowledge of analytical techniques with a critical assessment of implementation phases and a focus on data quality. Students will learn to identify sampling scenarios, conduct analyses of environmental pollutants, and interpret industrial hygiene data, evaluating relationships and discriminating between confounding factors.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Diagnostic methodologies in general and clinical pathology	Teaching language: Italian
SSD: MEDS-02/B	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	

Contents extracted from the SSD declaratory consistent with the training objectives of the course: Diagnostic-clinical pathology and laboratory methodology in cytology, cytopathology, immunohematology and genetic pathology and in the application of cellular and molecular methodologies to diagnostics in human pathology.	
Objectives: The course aims to provide students with basic knowledge of cellular and molecular methodologies for diagnostics in human pathology.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Molecular neurobiology		Teaching language: Italian	
SSD: MEDS-02/B		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The field focuses on the biochemical and evolutionary characteristics of nucleic acids and proteins and the relationships between the three-dimensional structure of proteins and nucleic acids. Particular attention is paid to the macromolecules involved in the transcription and translation of the information contained in nucleic acids, the macromolecules that are responsible for the control of gene expression, proliferation, and differentiation, and the macromolecules that enable the development of multicellular animal organisms.			
Objectives: The course aims to provide an in-depth overview of the molecular and technological aspects of neuroscience, focusing on the molecular mechanisms underlying the differentiation of stem cells in the human cerebral cortex during embryonic development and the methodologies for creating human disease models from patient cells.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Quality, safety, and traceability standards in the food industry		Teaching language: Italian	
SSD: MEDS-24/B		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector is concerned with scientific and educational activities in the fields of general and applied hygiene, preventive medicine, public health, health needs assessment, and health policies and strategies.			
Objectives: The course aims to provide in-depth knowledge of the national and international framework for food industry standards and procedures. Students will acquire skills regarding contamination that affects food quality throughout the entire production chain, using risk management strategies.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Parasitological diagnostics		Teaching language: Italian	
SSD: MVET-03/B		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector represents a cultural-scientific complex that studies fungi, protozoa, and metazoa (parasites) responsible for parasitic diseases, many of which are zoonotic, foodborne, waterborne, and vector-borne, as well as neglected or poverty-related tropical diseases. Training focuses on parasite biology and the parasite-host-environment relationship, addressing systematic, evolutionary, genetic, ecological, immunological, physiological, and pathological aspects, including the use of statistical-mathematical, genetic, and -omic methodologies, within a One Health vision.			
Objectives: The course aims to provide students with specialized knowledge aimed at acquiring mastery in the diagnosis of protozoan and metazoan parasites in humans and animals, with particular reference to those of a zoonotic nature.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Written and oral exam			

Course: Environmental biocatalysis		Teaching language: Italian	
SSD: BIOS-7/A		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biochemical methodologies for the identification, characterization, and analysis of biomolecules. Environmental and pollution biochemistry.			
Objectives: The course promotes a sustainable and innovative vision of biocatalysis, emphasizing the contribution of enzymes to the ecological transition. The molecular approach will serve as the guiding principle for developing design skills and critical analysis capabilities, enabling participants to interpret the underlying mechanisms enzyme technologies and propose effective solutions to address environmental challenges.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Elements of Pharmacology and Toxicology		Teaching language: Italian
SSD: BIOS-11/A		CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector is concerned with scientific and educational activities in the field of synthetic, biosynthetic, and biotechnological drugs and radiopharmaceuticals, and pharmacognosy. This includes the study of herbal drugs, defined as plants containing one or more pharmacologically active substances, their extracts and related active components, nutraceuticals, and toxicological aspects.		
Objectives: To provide students with the basic notions of pharmacology and toxicology, especially the general part of disciplines such as pharmacokinetics and pharmacodynamics.		

Entry requirements: None Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Physiology of Well-being	Teaching language: Italian
SSD: BIOS-06/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology analyzes how the living organism achieves and maintains homeostasis of its internal environment at the molecular, cellular, and tissue levels, in the context of changes in the surrounding environment. It studies the potential applications of this knowledge in the environmental, biotechnological, and sports fields, including those aimed at human well-being.	
Objectives: The Physiology of Well-Being course aims to provide students with the tools necessary to acquire knowledge regarding the relationship between bodily homeostasis and well-being, with particular reference to the role of environmental factors and lifestyle in the workplace.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Industrial and Occupational Hygiene	Teaching language: Italian
SSD: MEDS-24/B	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector is concerned with scientific and educational activities in the fields of general and applied hygiene, preventive medicine, public health, health needs assessment, and health policies and strategies.	
Objectives: The course provides knowledge regarding the purposes of workplace hygiene and epidemiology, methods for collecting data in epidemiology, measuring population health, especially in the workplace, main epidemiological models, and measures for assessing risk and related prevention in the workplace.	
Entry requirements: None Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Hygiene and Well-being in the workplace	Teaching language: Italian
SSD: MEDS-24/B	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector focuses on scientific and educational activities in the field of general and applied hygiene; it has specific expertise in workplace hygiene, preventive medicine, and the planning, organization, and management of healthcare	

services.
Objectives: The course provides a foundation in workplace hygiene, focusing on hygiene procedures and practices to promote safety and well-being in the workplace. Students will acquire the skills to identify hazards (physical, chemical, biological) that may arise in the workplace and plan preventive strategies.
Entry requirements: None
Exit requirements: None
Types of examinations and other tests: Oral exam

Course: Cellular Responses to Environmental Stress: Methodologies and Models	Teaching language: Italian
SSD: MEDS-24/B	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The course falls within the core content of the relevant Scientific-Disciplinary Sector, as it addresses the study of biological processes at the cellular level, with particular attention to the mechanisms of response, adaptation, and cellular dysfunction under stress conditions. The course explores the structural and functional organization of the cell, the main signaling pathways, and the use of cellular models to analyze cellular functions and their alterations. The course content enhances the applied approach to cell biology envisioned by the sector's declaration through the study of cellular responses to physical and chemical stimuli of environmental origin, the interpretation of cellular biomarkers of exposure and effect, and the use of cellular imaging as a support tool for the analysis of biological processes.	
Objectives: The course aims to provide students with advanced knowledge of the main cellular mechanisms involved in responses to environmental stress and the methodological approaches used to study them. Upon completion of the course, students will be able to critically understand and interpret the cellular processes of stress, damage, adaptation, and resilience induced by physical and chemical agents of environmental origin. The course also aims to develop the ability to evaluate the use of cellular and tissue models in the study of organism-environment interactions, recognizing their potential and limitations, and to interpret the biological significance of the main cellular biomarkers of exposure and effect. The skills acquired will enable students to integrate their knowledge of advanced cell biology into the context of environmental risk assessment and ecotoxicological monitoring.	
Entry requirements: None	
Exit requirements: None	
Types of examinations and other tests: Oral exam	

Course: Bioactive molecules: development and pharmacological activity	Teaching language: Italian
SSD: Chem-05/A	CFU: 6
Course year: first/second	Type of Educational Activity: D - At the student's choice
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Study of carbon compounds, both natural and synthetic, including amino acids and sugars. Elucidation of the mechanisms by which organic compounds form and transform both in the laboratory and in natural and environmental systems, their supramolecular interactions, structural characterization, and structure-reactivity relationships. The group also examines the effect of organic molecules on the environment and the circularity and sustainability of processes involving organic compounds. Design of biologically active organic compounds for their potential pharmaceutical use.	
Objectives:	

To provide students with knowledge and skills in the development of new bioactive organic compounds, including natural substances and their derivatives, through the study of receptor recognition mechanisms and the acquisition of the methodological tools necessary for rational drug design. The course pays particular attention to structure-activity relationships (SARs) and the main criteria for optimizing affinity and selectivity, as well as basic pharmacokinetic properties.

Entry requirements:

None

Exit requirements:

None

Types of examinations and other tests:

Oral exam

Course: Neuroinflammation		Teaching language: Italian	
SSD: MEDS-02/A		CFU: 6	
Course year: first/second	Type of Educational Activity: D - At the student's choice		
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: This field focuses on the study of general human pathology and general pathophysiology; basic and applied research including the study of cellular pathology, with specific expertise in oncology, immunology, immunopathology, and genetic pathology.			
Objectives: The course aims to provide students with the tools to understand and analyze the cellular and molecular mechanisms specific to the inflammatory process of the central nervous system, its role in neurodegenerative processes, and the pathogenesis of acute disease.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

Course: Experimental methodologies for the study of fibrillar aggregates		Teaching language: Italian	
SSD: CHEM-02/A		CFU: 6	
Course year: first/second		Type of Educational Activity: D - At the student's choice	
Teaching Methods: In presence			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The department is involved in scientific and educational activities in the study of the fundamental phenomena underlying chemical systems, addressing them at the atomic, molecular, and supramolecular levels. In addition to the descriptive-phenomenological aspect, the department develops theories, experimental, and computational methodologies for interpreting and predicting the behavior of complex systems such as biological, inorganic, organic, and hybrid systems.			
Objectives: This course contributes to the educational objectives of the Degree Program in Biological Sciences, Neuroscience Curriculum, allowing students to broaden and deepen their knowledge in the molecular field, with particular attention to protein aggregation phenomena, which are closely related to protein conformational states and determine the onset of numerous neurodegenerative diseases.			
Entry requirements: None			
Exit requirements: None			
Types of examinations and other tests: Oral exam			

ANNEX 2.2

DEGREE PROGRAM DIDACTIC REGULATIONS

BIOLOGICAL SCIENCES

CLASS LM-6

School: Polytechnic of Basic Sciences

Department: Biology

Regulations in force from a.y. 2026-2027

Training Activity: English language laboratory 2 (LIN/12)	Training Activity Language: English	
Content of the activities consistent with the training objectives of the course: Additional linguistic knowledge	CFU: 4	
Course year: first	Type of Training Activity: F- Further training activities	
Teaching Methods: in-person/by distance teaching		
Objectives: Acquisition of advanced notions for understanding scientific texts and articles in English. Independent use of the language for the exposition of scientific topics and technical discussions. Clear and detailed writing of your opinions in English. Strengthening and developing autonomy in English conversation.		
Propaedeuticities: None		
Is a propaedeuticity for: None		
Types of examinations and other tests: apptitude		

Training Activity: under Art. 10, c. 5, letter d	Training Activity Language: English	
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: First/second		Type of Training Activity: F- Further training activities
Teaching Methods: in-person/by distance teaching		
Objectives: Acquisition of knowledge of the complex world of work in the organic 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