DIDACTIC REGULATIONS OF THE DEGREE PROGRAM

BIOLOGIA

CLASS LM-6

School: Politecnica e delle Scienze di Base

Department: Biologia

Regulations in force since the academic year 2025/26

ACRONYMS

CCD	[Commissione di Coordinamento Didattico]	Didactic Coordination Commission
CdS	[Corso/i di Studi]	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 Educational Obligations
SUA-CdS	[Scheda Unica Annuale del Corso di Studi]	Annual Single Course Schedule
RDA	[Regolamento Didattico di Ateneo]	University Didactic Regulations

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Art. 1
Object

1. These Didactic Regulations govern the organisational aspects of a Master's Degree Program in "Biology" (class LM-6 - Biology). The Master's Degree Program in Biology is hinged in the Department of Biology.
   General Information
   Master's Degree Program name in Italian: Biologia
   Master's Degree Program name in English: Biology
   Class: LM-6 - Biology
   Teaching language: Italian
   Course delivery methods: conventional
2. The Degree course is governed by the Didactic Coordination Commission (CCD), according to Art. 4 of the RDA.
3. The Didactic Regulations are 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 aim of the Master's Degree Program in Biology is to train figures of broad cultural depth and other professional profiles characterized by in-depth theoretical-operational preparation in the characterizing disciplines of class. The proposed educational path, consistent with the skills that current legislation provides for the biologist, is aimed at:
1. provide in-depth preparation in the disciplines that characterize the class;
2. provide the tools necessary to be experts in data acquisition, processing, and analysis techniques;
3. provide advanced knowledge of modern bioinformatics tools in order to query database useful to support both basic and applied research;
4. enable the student to develop experimental strategies for the study and/or resolution of biological problems;
5. enable the student to use the Italian and English languages fluently, in written and oral form, also concerning disciplinary lexicons;
6. enable them to acquire broad operational and planning autonomy, which can also allow them to take on managerial roles that provide complete responsibility for projects, structures, and personnel.

The proposed educational path, consistent with the skills that current legislation provides for the biologist, is aimed at training high professional profile figures whose activity may concern the areas listed below which however do not exhaust the framework of the potential employment spectrum of the Biologist:

a) activities for the promotion, dissemination, and development of scientific and technological innovation, as well as management and design of technologies;

b) professional activities in fields related to biological disciplines, in public and private research institutes, in the industrial, healthcare, and public administration sectors, in forensic, biological and microbiological analysis, biological control and quality laboratories products of organic origin;

c) activities in the industrial, healthcare, nutritional, environmental, and cultural heritage fields that involve biological, molecular, and biochemical applications.

The Master's Degree in Biology is divided into curricula dedicated to cellular and molecular biology, differentiation and reproduction biology, forensic biology, and nutrition biology; each curriculum includes blocks of characterizing courses that ensure a solid and integrated cultural preparation in basic biology and its application sectors with particular attention to theoretical advancements and technological applications and a series of similar and integrative courses that guarantee individual training paths.
The educational path takes place in four semesters. Depending on the curricula, in the first year skills in biochemistry, molecular biology, genetics, pathology, and physiology will be developed and consolidated. In the second year, theoretical-operational knowledge and skills will be developed in areas such as cellular and molecular biology development and reproduction or nutrition or diagnostic or forensic biology.
An important part of the training course of the second year will be laboratory activities, aimed at the preparation of an experimental thesis, and the application and deepening of specific knowledge acquired which will allow one to learn the correct ways to approach and solve problems that the Biologist will have to face in the various relevant work areas.
Thanks to an internship at a university biological research laboratory, other research institutes, analytical or monitoring laboratories, production companies in the biological, biochemical, pharmaceutical, or biotechnological fields, healthcare facilities, or local authorities operating in the biological field-environmental or structures engaged in voluntary activities or other activities useful for entering the world of work, the student acquires knowledge of the world of work in the biological field and consolidates his perception and awareness of the necessary transition between university preparation and its application in professional activities.
Graduates with a master's degree in Biology will acquire at least one European Union language in addition to Italian and will possess adequate knowledge to use the IT tools necessary in the specific areas of expertise, for communication and the exchange of information

Art. 3
Professional profile and work opportunities

The Master degree aims to train the professional figure of the Biologist.
According to Presidential Decree 328/01, graduates can take the state exam for the qualification to practice the profession of Biologist and consequently obtain registration in the National Order of Biologists (section B).
The course prepares students for the profession of biologist, as stated by Law No. 396/67 of 24 May 1967 and Presidential Decree No. 328 of 5 June 2001, after passing the State Examination. The object of the professional activity, consisting of holding roles of high responsibility to be carried out independently, may concern: research and experimentation activities in the molecular and cellular fields applied to the biomedical, microbiological, and biotechnological fields in public or private research institutes; molecular, microbiological, cytological and genetic analyses in the healthcare sector, in hospitals and public and private clinical analysis laboratories; professional activity in the field of reproduction and assisted reproduction in the healthcare sector in public and private facilities; planning activities for nutritional interventions for individuals and populations; evaluation of biological findings and genetic characterizations in the forensic field; predictive genetics; technical consultancy in the forensic field;
scientific and technological promotion and innovation activities in the genetic and molecular biological fields, in cellular biology and technology, in metabolic and nutritional evaluations, in the

analysis and development of biomolecules and microorganisms for biotechnological, biomedical, and industrial applications;

teaching activities, scientific information, diffusion, and dissemination of knowledge acquired in the technical-scientific field.

To carry out the functions described above, the master's graduate in Biology possesses the specific knowledge, skills, and abilities listed below:

Solid cultural preparation in basic and applied biology;

In-depth conceptual and operational knowledge of the methodologies applied in biochemistry, genetics, molecular biology,cellular biology, microbiology, and particularly in the field of the study and analysis of biological macromolecules, molecular and forensic diagnostics, in the field of reproduction and development, and in the field of metabolism and of nutrition.

Solid technological skills and abilities for broad-spectrum biological and instrumental analyses, aimed at both research activities and monitoring and control activities;

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.

Graduates with a master's degree in Biology 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, laboratories, firms, or companies in the following sectors:

- Cytological, microbiological, metabolic, nutritional, biochemical, and genetic analyses;
- Reproduction and assisted fertilization;
- Typing, also through the use of molecular markers, of individuals and animal, plant, and microbial species for food, legal, healthcare, and pharmaceutical purposes;
- Public and private scientific research and service research in the biomolecular, cellular, and nutrition fields;
- Management and analysis of databases in the biological field;
- Biotechnological, industrial, and biomedical companies;
- Institutes and structures responsible for defining the nutritional needs of individuals and populations;
- Pharmaceutical companies, as a pharmaceutical promoter or medical representative;
- Training and scientific dissemination.

Art. 4

Admission requirements and knowledge required for access to the Degree Course[1]

The student who intends to enroll in the Master's Degree Course in Biology must have a three-year university degree or diploma or other qualification obtained abroad, recognized as suitable according to current legislation.

1- For direct access to the Master's Degree Course in Biology, the student must demonstrate that they have acquired the knowledge required for the three-year degree of class L-13 (i.e. class 12 ex Ministerial Decree 509).

2- Students coming from other degree classes must demonstrate knowledge of the BIO/, CHIM/, FIS/, MAT/ SSDs. Possession of curricular requirements is determined by having

[1] Artt. 7, 10, 11 of the University Didactic Regulations.

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 CFU in courses in the scientific disciplinary sectors from MAT/01 to MAT/09 - at least 6 CFU in courses in the scientific disciplinary sectors from FIS/01 to FIS/08 - at least 12 CFU in courses in the scientific sectors disciplinary issues CHIM/01, CHIM/03, CHIM/06, CHIM/12 - at least 6 CFU in courses in the BIO/09, MED/04, MED/42 sectors - at least 20 CFU in courses in the BIO/01, BIO/02 sectors, BIO/03, BIO/05, BIO/06, BIO/07, BIO/16, BIO/17. - 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.

3- The adequacy of personal preparation for access to the Master's Degree Course in Biology will be verified using methods defined in the Degree Course Teaching Regulations and published on the Biology Department's Web site.

Art. 5
Procedures for Access to the Degree Course

1. The Coordinator Didactic Commetee (CCD) of the Degree Program normally regulates the admission criteria and any scheduling of enrolments, except in the case subject to different provisions of law[2].
2. Verification of personal preparation is always mandatory, and only students who meet the curricular requirements can access it. The verification methods will be redefined annually by the CCD and published on the Web site of the Department of Biology.

Art. 6
Teaching activities and Credits

Each training activity, prescribed by the Degree course detail sheet, is measured in CFU. Each CFU corresponds to 25 hours of overall training commitment[3] 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 according to the type of training activity, are as follows [4]:

- Lecture or guided teaching exercises: 8 hours per CFU;
- Seminar: 8 hours per CFU;
- Exercise: 8 hours per CFU;
- Laboratory activities, internship or fieldwork: 25 hours per CFU;

For Thesis activities, each credit corresponds to 25 hours of overall training commitment [5].

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

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

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

[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.

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

Art. 7
Description of teaching methods

The didactic activity is carried out in a conventional modality[6].
If necessary, the CCD decides which courses also include teaching activities offered online, according to Ministerial Decree 289 of 25 March 2021 (general guidelines for the three-year planning of universities 2021-2023), in Annex 4, letter A.
Some courses may also take place in seminar form and/or involve classroom exercises, language, and computer laboratories.
Detailed information on how each course is conducted can be found in the course sheets.

Art. 8
Testing of learning activities[7]

1. The CCD, within the prescribed regulatory limits[8], 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[9].

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[6] Please note that, according to Ministerial Decree 289 of 25 March 2021 (general guidelines for the three-year planning of universities 2021-2023), in Annex 4, letter A, the types of programs are as follows:

a) Conventional Degree Programs. Degree Programs delivered entirely in person, or which provide - for activities other than practical and laboratory activities - a limited teaching activity delivered electronically, to an extent not exceeding one tenth of the total.

b) Degree Programs with mixed modality. Degree Programs that provide - for activities other than practical and laboratory activities - a significant proportion of the training activities delivered electronically, but no more than two-thirds.

c) Degree Programs mainly delivered by distance teaching. Degree Programs delivered predominantly by telematic means, to an extent exceeding two-thirds (but not all) of the training activities.

d) Degree Programs delivered entirely by distance. In these Degree Programs all the training activities are delivered electronically; the presence of the examinations of profit and discussion of the final examinations remains unaffected.

[7] Article 22 of the University Didactic Regulations.

[8] 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".

[9] 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."

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 honors by a unanimous vote of the Board. Examinations are marked out of 30 or with a simple pass mark. Assessments 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 Regulations[10].

Art. 9
Course structure and syllabus

1. The legal duration of the Study Course is 2 years. Enrollment is also possible based on a contract according to the rules established by the University (Art. 24 University Teaching Regulations).
   The student must acquire 120 CFU[11], attributable to the following Types of Training Activities (TAF):
   B) characterizing,
   C) similar or integrative,
   D) at the student's choice[12].
   E) for the final test,
   F) further training activities.
2. The degree is awarded after having acquired 120 CFU by passing exams, no more than 12 in number, including the final exam[13] 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 unit[14]. Tests constituting an assessment of suitability for the activities referred to in Article 10, paragraph 5, letters c), d) and

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

[11] 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.

[12] 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).

[13] Art. 14, c. 7 of the University Didactic Regulations ('the final exam for the Master's Degree is included in the calculation of the maximum number of exams').

[14] Pursuant to the D.M. 386/2007.

e) of Ministerial Decree 270/2004[15] are excluded from the count. Integrated Courses comprising of two or more modules are subject to a single examination.

3. To acquire the CFU relating to independently chosen activities, the student has freedom of choice among all the courses activated at the University, as long as they are consistent with the training project. This coherence is evaluated by the Teaching Coordination Commission of the Course. Even for the acquisition of CFU relating to independently chosen activities, "passing the exam or other form of profit verification" is required (Art. 5, c. 4 of Ministerial Decree 270/2004). 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.
4. The study plan summarizes the structure of the course by listing the courses provided divided by the year of the course and possibly by curriculum. At the end of the study plan table, the preparatory requirements provided for by the Study Course are listed. The study plan offered to students, with an indication of the scientific-disciplinary sectors and the relevant area, of the credits, and of the type of teaching activity is reported in Annex 1 to these Regulations.
5. 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 Degree course detail sheet of the academic year of enrollment. The individual study plan is approved by CCD.

Art. 10[16]
Attendance requirements

1. Attendance at lectures is strongly recommended but not mandatory.
2. In the case of individual courses with compulsory attendance, this option is indicated in the relevant course schedule available in the Attachment
3. If the teacher provides for a different modulation of the program between attending and non-attending students, this is indicated in the individual Teaching Sheet published on the course web page and the UniNA teacher's website.
4. Attendance at seminar activities that award training credits is mandatory. The relevant profit verification methods for the attribution of CFU are the responsibility of the CCD.

[15] 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".

[16] Art. 22, c. 10 of the University Didactic Regulations.

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 the teacher's UniNA website.

Art. 12
Course Calendar

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

Art. 13
Criteria for the recognition of credits earned in other Courses in the same Class[17]

For students coming from Degree Programs of the same class, the Didactic Coordination Commission ensures the full recognition of CFU, when associated with activities that are culturally compatible with the training Degree Program, acquired by the student at the originating Degree Program, according to the criteria outlined in Article 14 below. Failure to recognise credits must be adequately justified. This is without prejudice to the fact that the number of credits relating to the same scientific-disciplinary sector directly recognised by the student may not be less than 50% of those previously achieved. In case the originating course is conducted in distance learning mode, the minimum 50% fee is recognized only if the originating course is accredited according to the ministerial regulation referred to in Article 2, paragraph 148, of the legislative decree of October 3, 2006, No. 262, converted by the law of November 24, 2006, No. 286.

Art. 14
Criteria for the recognition of credits acquired in Degree Courses of different classes, in university or university-level Degree Courses, through single courses, at online Universities, and in international Degree Programs[18]; 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 based on the following criteria:
   - analysis of the activities carried out;

[17] Art. 19 of the University Didactic Regulations.

[18] Art. 19 of the University Didactic Regulations.

- 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 recognized. Recognition is carried out up to the number of credits envisaged by the didactic system of the Degree Program. Failure to recognize credits must be adequately justified. According to Art. 5, paragraph 5-bis, of the Ministerial Decree, 270/2004, it is also possible to acquire training credits at other Italian universities based on agreements stipulated between the institutions involved, following current regulation[19].

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 enroll while already in possession of a degree of the same level[20].
3. With regard to the criteria for the recognition of CFU acquired in extra-curricular activities, pursuant to Art. 3, par. 2, of Ministerial Decree (D.M.) 931/2004, within the limit of 24 CFU, the following activities may be recognised (Art. 2 of D.M. 931/2024):
    - Professional knowledge and skills, certified in accordance with the current regulations as well as knowledge and skills acquired in post-secondary-level training activities.
    - Training activities carried out in the cycles of study at the public administration training institutions as well as knowledge and skills acquired in post-secondary-level training activities, which the University contributed to developing and implementing.
    - Achievement of an Olympic or Paralympic medal or the title of absolute world champion, absolute European champion or absolute Italian champion in disciplines recognized by the Italian National Olympic Committee or the Italian Paralympic Committee.

Art. 15
Guidelines for enrolment in individual Degree Courses

Enrolment in individual teaching courses, provided for by the University Didactic Regulations[21], is governed by the "University Regulations for enrolment in individual teaching courses activated as part of the Degree Program"[22]

Article 16
Features and arrangements for the final examination

The final examination will consist of the presentation and discussion of an experimental thesis containing the results of original research conducted on a scientific topic agreed upon in advance with a supervisor affiliated with the course of study. The supervisor will oversee the activity in its various phases. The thesis work can be carried out in a university or non-university laboratory, including at another Italian or foreign location, under the guidance of a university supervisor and a co-supervisor, in the case of non-university research centers.

[19] Art. 6, c. 9 of the University Didactic Regulations.

[20] R.D. No. 3241/2019.

[21] Art. 19, c. 4 of the University Didactic Regulations.

[22] R.D. No. 3241/2019.

The final examination for the award of the Master's Degree in Biology involves the presentation and discussion by the graduating student of an experimentally elaborated thesis, reporting the results of original research conducted on a scientific topic previously agreed upon with a supervisor affiliated with the course of study. The supervisor will oversee the activity in its various phases. The thesis work can be carried out in a university or non-university laboratory, including at another Italian or foreign location, under the guidance of a university supervisor and a co-supervisor, in the case of non-university research centers.
The credit value in CFU (Crediti Formativi Universitari) for the thesis is indicated for each curriculum in the course syllabus table. For students conducting their thesis abroad within an Erasmus or similar program, an additional credit is granted for the preparation of the presentation and discussion of the thesis.
To be admitted to the final examination, the student must have obtained all the required educational credits specified in the course's didactic regulations, excluding those reserved for the final examination.
The thesis defense will take place in the presence of a duly appointed commission and may involve the use of audio-visual aids.
The examining commission for the final examination, constituted according to the provisions of Article 29, paragraph 7, of the Academic Regulations, after confirming the student's successful completion of the examination, establishes the final grade on a scale of one hundred, taking into account the student's academic record, the thesis, and the presentation. In the case of achieving a score of 110/110, the commission may unanimously decide to award honors.

Article 17
Guidelines for work internships and placements

1. Students enrolled in the Degree Program may decide to carry out internships or training periods with organisations or companies that have an agreement with the University. Traineeships are not compulsory and contribute to the award of credits as 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 270/2004[23]
2. The modalities and characteristics of traineeship and internship are regulated by the CCD with specific regulations.
3. The University of Naples Federico II, through the Student Internship Office Incoming and outgoing orientation office, placement, and outreach ensures constant contact with the world of work, to offer students and graduates of the University concrete opportunities for internships and work experience, and to promote their professional integration.

Article 18
Disqualification of student status[24]

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.

[23] Traineeships ex letter d can be both internal and external; traineeships ex letter e can only be external.

[24] Art. 24, c. 5 of the University Didactic Regulations.

Article 19
Teaching tasks, including supplementary teaching, guidance and tutoring activities

Professors and researchers carry out the teaching load assigned to them under the provisions of the RDA the Regulations on the teaching and student service duties of professors and researchers and the procedures for self-certification and verification of actual performance[25].

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. 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)[26] System, developed following the document "Self-evaluation, Evaluation, and Accreditation of the Italian University System" of ANVUR, using:
   - surveys on the degree of placement of graduates into the world of work and on post-graduate needs;
   - data extracted from the administration of the questionnaire to assess student satisfaction for each course in the curriculum, with questions relating to the way the course is conducted, teaching materials, teaching aids, organisation, and 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.

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[25] R.D No. 2482//2020.

[26] 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.

Article 22
Publicity and Entry into Force

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

ANNEX 1.2

DEGREE PROGRAM DIDACTIC REGULATIONS

BIOLOGY

CLASS LM-6

School: Polytechnic and Basic Sciences

Department: Biology

Regulations in force for the academic year 2025/26

STUDY PLAN A.Y. 2025-2026

KEY

Type of Educational Activity (TAF):
B = Characterising
C = Related or Supplementary
D = Optional activities/Free choice activity
E = Final examination and language knowledge
F = Further training activities

I Year									
Curriculum Molecular and Cellular Biology									
Title Teaching	**SSD**	**Module**	**Credits**	**hours**	**Type activities**	**Course modalities**	**TAF**	**Disciplinary areas**	**Mandatory /optional**
Biophysical chemistry	CHIM/02	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Advanced biochemistry and protein engineering	BIO/10	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
General and molecular pathology and immunology	MED/04	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
English language laboratory 2	LIN/12	single	4	32	Frontal lesson	In-person/by distance	F	Additional linguistic knowledge	Mandatory
Molecular genetics	BIO/18	single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Advanced molecular biology	BIO/11	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory

Molecular microbiology	BIO/19	single	6	48	Frontal lesson	In-person	B	Biomolecular	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
II Year									
Genomics and system biology	BIO18	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Advanced methodologies in cell biology	BIO06	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
Plant cellular and molecular physiology	BIO04	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Thesis activity			38	950		In-person	E	For the final test	Mandatory

I Year									
Curriculum Differentiation and Reproduction Biology									
Title Teaching	**SSD**	**Module**	**Credits**	**hours**	**Type activities**	**Course modalities**	**TAF**	**Disciplinary area**	**Mandatory /optional**
Biology of reproduction	BIO/06	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
Cellular biochemistry	BIO/10	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
General and molecular pathology and immunology	MED/04	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 activity	Mandatory
English language laboratory 2	LIN/12	single	4	32	Frontal lesson	In-person/by distance	F	Additional linguistic knowledge	Mandatory
Molecular biology of development and differentiation	BIO/11	single	8	64	Frontal lesson	In-person	B	Biomplecular	Mandatory
Animal development and differentiation	BIO/06	single	8	64	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Biotechnologies of reproduction	BIO/06	single	6	48	Frontal lesson	In-person	B	Biodiversity	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
II Year									
Biology applied to reproduction and development	BIO/13	single	6	48	Frontal lesson	In-person	B	Nutrition and Other applications	Mandatory
Genetics of development and differentiation	BIO/18	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Plant cellular and molecular physiology	BIO/04	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Thesis activity			36	900		In-person	E	For the final test	Mandatory

I Year									
Curriculum Biology of Nutrition									
Title Teaching	**SSD**	**Module**	**Credits**	**hours**	**Type activities**	**Course modalities**	**TAF**	**Disciplinary area**	**Mandatory /optional**
Food related organic molecules	CHIM/06	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Biochemistry of nutrition	BIO/10	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Plants and nutrition	BIO/02	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
English language laboratory 2	LIN/12	single	4	32	Frontal lesson	In-person/by distance	F	Additional linguistic knowledge	Mandatory
Microbiology and nutrition	BIO/19	single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Physiology of nutrition	BIO/09	single	8	64	Frontal lesson	In-person	B	Biomedical	Mandatory
Nutrigenetics and nutrigenomics	BIO/18	single	8	64	Frontal lesson	In-person	B	Biomolecular	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
II Year									
Applied nutrition	BIO/09	single	8	64	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Dietetics	BIO/09	single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory

Redox homeostasis and nutrition	BIO/09	single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
Thesis activity			36	900		In-person	E	For the final test	Mandatory

I Year									
Curriculum Forensic Biology									
Title Teaching	**SSD**	**Module**	**Credits**	**hours**	**Type activities**	**Course modalities**	**TAF**	**Disciplinary area**	**Mandatory /optional**
Forensic chemistry	CHIM/01	single	8	64	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Forensic botany	BIO/01	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
Forensic zoology	BIO/05	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
English language laboratory 2	LIN/12	single	4	32	Frontal lesson	In-person/by distance	F	Additional linguistic knowledge	Mandatory
Forensic molecular biology	BIO/11	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Forensic microbiology	BIO/19	single	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
Forensic biochemistry	BIO/10	single	8	64	Frontal lesson	In-person	B	Biomolecular	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
II Year									
Quality and safety of laboratories	MED/42	unico	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
Forensic genetics	BIO/18	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Criminal legal aspects in forensic investigations	IUS/17	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Thesis activity			36	900		In-person	E	For the final test	Mandatory

I Year									
Curriculum Cell biology applied to the health and aesthetics of the skin									
Title teaching	**SSD**	**Module**	**Credits**	**hours**	**Type activities**	**Course modalities**	**TAF**	**Disciplinary area**	**Mandatory /optional**
Cellular and applied biology of the skin	BIO/13	single	6	48	Frontal lesson	In-person	B	Nutrition and Other applications	Mandatory
Biochemistry and molecular adaptations to cellular alterations	BIO/10	single	8	64	Frontal lesson	In-person	B	Biomolecular	Mandatory
Anatomy and histology of the skin	BIO/06	single	6	48	Frontal lesson	In-person	B	Biodiversity	Mandatory
At the student's choice activity		single	6	48	Frontal lesson	In-person	D	At the student's choice	Mandatory
English language laboratory 2	LIN/12	single	4	32	Frontal lesson	In-person/by-distance	F	Additional linguistic knowledge	Mandatory
Genetics and molecular biology of the skin	BIO/18	Genetics of skin	6	48	Frontal lesson	In-person	B	Biomolecular	Mandatory
	BIO/11	Molecular biology of skin	6	48	Frontal lesson	In-person	B	Biomolecular	
Physiology of the skin	BIO/09	single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
Microbiota and skin well-being	BIO/19	single	6	48	Frontal lesson	In-person	B	Biomolecular	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
II Year									
Hygiene, quality and safety in laboratories	MED/42	single	6	48	Frontal lesson	In-person	B	Biomedical	Mandatory
Nutrition and well-being of the skin	BIO/09	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Natural substances for skin wellbeing	CHIM/06	single	6	48	Frontal lesson	In-person	C	Related or Supplementary	Mandatory
Thesis activity			36	900		In-person	E	For the final test	Mandatory

ANNEX 2.1

DEGREE PROGRAM DIDACTIC REGULATIONS

BIOLOGY

CLASS LM-6

School: Polytechnic and Basic Sciences

Department: Biology

Didactic Regulations in force since the academic year 2025/26

Curriculum Molecular and Cellular Biology

Course: Biophysical chemistry		**Teaching Language:** Italian
SSD (Subject Areas): CHIM/02		**CREDITS:** 6
Course year: first	**Type of Educational Activity: C –** related or supplementary	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physical Chemistry aims to describe, at both the macroscopic and atomic-molecular levels, the structure, properties and transformations of matter. Relying increasingly on the development of experimental and computational methodologies, it aims at building models for interpreting and predicting experimental parameters and solving problems related to complex systems of biological interest.		
Objectives: The course aims to provide the basic concepts of physical chemistry for the study of biological macromolecules properties. The thermodynamic principles are illustrated with special focus on chemical equilibrium, as well as the basis of chemical kinetics and spectroscopy with its potential applications. The course provides the student with the information necessary to understand the properties of biological macromolecules and the interactions underlying their biological function. The aim of the course is to allow the acquisition of in-depth knowledge of the principles of physical chemistry for the understanding of molecular stability and recognition in model biological systems.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Advanced Biochemistry and Protein Engineering		**Teaching Language:** Italian
SSD (Subject Areas): BIO/10		**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
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, enzymology, molecular structural biology, biocrystallography, biophysics, computational biochemistry and bioinformatics; recombinant molecular technologies for engineering proteins.
Objectives: The course, through the illustration of advanced biochemical techniques, has the educational objective of providing knowledge on the evolution and structural organization of proteins, on their modifications and their interaction in vivo for the understanding of complex biological systems.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: General and molecular pathology and immunology	**Teaching Language:** Italian
SSD (Subject Areas): MED/04	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: General pathology and pathophysiology; basic and applied research including the study of cellular pathology with specific skills in the fields of oncology, immunology and immunopathology and genetic pathology.	
Objectives: The course aims to provide students with the elements to analyze the general and molecular pathophysiology and etiopathogenesis that contribute to the development of a disease state.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Molecular genetics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector defines and analyses the structure of genetic material and its levels of organization in microbial, animal, and plant systems, including humans. Investigates the genetic and molecular bases of evolution, development, immune response, behavior, and hereditary diseases.	
Objectives: The course aims to provide the student with knowledge of molecular genetics for understanding cellular pathways underlying physiological and pathological mechanisms. The teaching aims to provide the student with the tools to investigate biological problems using the correct theoretical and methodological approach in the experimental phase.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral and written examination	

Course: Advanced Molecular Biology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/11	**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular biology studies the biological functions at the molecular level of informational macromolecules. This field is interested in analysing interactions between nucleic acids and proteins, as well as between proteins themselves. Special attention is directed towards macromolecules involved in repairing, transcribing, and translating the information contained in nucleic acids. Additionally, focus is placed on macromolecules responsible for controlling gene expression, proliferation, cellular differentiation, and transformations.	
Objectives: The course aims to provide students with advanced knowledge concerning chromatin structure and dynamics, the topological organization of the nucleus, and the transcriptional and post-transcriptional mechanisms regulating gene expression in vertebrates. Objectives encompass understanding cutting-edge methodological analyses employed in transcriptomics and epigenomics..	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Molecular Microbiology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/19	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular mechanisms controlling gene expression in bacteria and viruses; interactions between bacteria; host-microbe interactions.	
Objectives: The course aims of the course are to provide to the students a deep knowledge of the molecular mechanisms controlling gene expression in bacteria and of the interactions between bacteria and eukaryotes. Details on the experimental approaches of molecular microbiology, microbial genomics and metagenomics will be provided.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Genomics and system biology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 8
Course year: second	**Type of Educational Activity: B –** characterising

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The sector analyses the structure and evolution of genes and genomes, also at a computational and bioinformatic level. Investigates the genetic and molecular bases of evolution and the practical applications of genetics and the molecular technologies derived from it.

Objectives:
The course aims to provide students with the knowledge and concepts useful for understanding the phenomenon of life as a genetic program encoded by the genome and as a set of genetic networks of interactions that carry out the encoded program. The course aims to provide students with the basic knowledge for the understanding and application of biostatistical analysis techniques and system-level modeling of genomic data. It also aims to provide the technological notions necessary to understand how to analyze and compare omics data with particular emphasis on transcriptomics and differential expression analysis.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral examination

Course: Advanced methodologies in cell biology	**Teaching Language:** Italian
SSD: BIO/06	**CFU:** 6
Course year: second	**Type of Educational Activity: B** - characterizing

Teaching methods:
In person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The disciplines included in the sector represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.

Objectives:
The aim of the course is the acquisition of in-depth biological and molecular knowledge and the understanding of the interaction between cells and between cells and the 2D and 3D environment. The study of microscopes and their use in cell biology will be addressed, with particular reference to high resolution microscopy and 2D and 3D cell cultures.

Propaedeuticities:
Cytology and histology
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral and written examination

Course: Plant cellular and molecular physiology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/04	**CREDITS:** 6
Course year: second	**Type of Educational Activity: C –** related or supplementary

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The course involves the study of the morpho-physiology, biochemistry and molecular biology of plants and growth regulators, in order to describe the molecular mechanisms of operation. Application aspects will be covered, such as the mechanisms underlying productivity control and plant biotechnologies

Objectives: The training objective of the course is to provide theoretical-practical knowledge relating to the regulation of development and morphogenesis of plantS. The aim of the course will allow students to acquire in-depth knowledge on the regulation of the expression and morphogenetic development of higher plants. Particular attention will be paid to the role of photoreceptors and plant growth regulators from a molecular and cellular point of view in the main phases of the development of plant organs. Understanding these mechanisms will help students to develop integrated specialist skills relating to the improvement of cultivated plants and methodological skills on responses to biotic and abiotic stresses in plants. Understanding these mechanisms will allow students to develop integrated specialist skills relating to the improvement of cultivated plants and methodological skills on responses to biotic and abiotic stresses in plants.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Curriculum Differentiation and Reproduction Biology

Course: Biology of reproduction		**Teaching Language:** Italian
SSD: BIO/06		**CFU:** 6
Course year: first	**Type of Educational Activity: B** - characterizing	
Teaching methods: In person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the sector represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.		
Objectives: The aim is to provide knowledge relating to the biology of vertebrate reproduction with particular reference to the reproduction of mammals, humans and assisted reproduction techniques.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Written and oral examination		

Course: Cellular Biochemistry		**Teaching Language:** Italian
SSD (Subject Areas): BIO/10		**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular and regulatory mechanisms of biotransformations, gene expression and regulation, signal transduction, intra- and intercellular communications. Apoptosis.		
Objectives:		

The aim of the course will be to allow the acquisition of in-depth knowledge of the biochemical mechanisms underlying cellular processes such as intra-cellular traffic, intercellular communication, the dynamics of the cytoskeleton and the response to different types of stress.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: General and molecular pathology and immunology		**Teaching Language:** Italian
SSD (Subject Areas): MED/04		**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: General pathology and pathophysiology; basic and applied research including the study of cellular pathology with specific skills in the fields of oncology, immunology and immunopathology and genetic pathology.		
Objectives: The course aims to provide students with the elements to analyze the general and molecular pathophysiology and etiopathogenesis that contribute to the development of a disease state.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Molecular biology of development and differentiation		**Teaching Language:** Italian
SSD (Subject Areas): BIO/11		**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular biology studies the biological functions at the molecular level of informational macromolecules. This field is interested in analysing interactions between nucleic acids and proteins, as well as between proteins themselves. Special attention is directed towards macromolecules involved in repairing, transcribing, and translating the information contained in nucleic acids. Additionally, focus is placed on macromolecules responsible for controlling gene expression, proliferation, cellular differentiation, and transformations.		
Objectives: The course aims to provide students with advanced knowledge concerning molecular aspects of vertebrate embryonic development, with a specific focus on the molecular mechanisms underlying DNA duplication translation, RNA transcription and proteins synthesis. The course will also focus on cutting-edge methodological analyses employed in the study of pathologies related to embryonic development.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Animal development and differentiation	**Teaching Language:** Italian
SSD: BIO/06	**CFU:** 8
Course year: first	**Type of Educational Activity: C –** related or supplementary
Teaching methods: In person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the sector represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.	
Objectives: The course aims to provide the basic knowledge for understanding and studying the molecular mechanisms that regulate the initial phases of development and differentiation during the formation of a new organism.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Written and oral examination	

Course: Biotechnologies of reproduction	**Teaching Language:** Italian
SSD: BIO/06	**CFU:** 6
Course year: first	**Type of Educational Activity: B** - characterizing
Teaching methods: In person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the sector represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.	
Objectives: Among the training objectives, the course pays particular attention to the innovative technologies and methodologies underlying the production of human and animal embryos and their cryopreservation, the in vitro production of gametes through organ-specific cultures and the production of artificial gametes.	
Propaedeuticities: Biology of reproduction **Is a propaedeuticity for:** Nothing	
Types of examinations and other tests: Written and oral examination	

Course: Biology applied to reproduction and development	**Teaching Language:** Italian
SSD (Subject Areas): BIO/13	**CREDITS:** 6
Course year: second	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course:	

Cell and applied biology study fundamental mechanisms regulating homeostasis and development of tissues and of living organisms. Furthermore, promotes the strengthening of biotechnological applications and their technology transfer. The learning path of cell and applied biology is focused on generating and characterizing *in vitro* and *ex vivo* models of developmental biology, that would be useful to understand cellular differentiation, proliferation, and communication between cells.

Objectives:
To know the most important technologies and methodologies allowing the characterization of the fundamental mechanisms of cell and embryonal differentiation. Among the formative objectives, the teaching is particularly focused on practical applications of cell differentiation processes *in vitro*, *ex vivo* and *in vivo*. The formative pathway will provide the right tools to allow the student developing critical competences about the subjects of the lessons, with the implications to innovation and technology transfer.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral and written examination

Course: Genetics of development and differentiation	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 6
Course year: second	**Type of Educational Activity: B –** characterising

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The sector investigates the genetic and molecular basis of development. The sector studies the regulation of gene expression. It also deals with genetic dissection and manipulations of hereditary material used for the purpose of understanding biological phenomena.

Objectives:
The training objective of the course is to provide the student with the knowledge needed to understand the molecular mechanisms underlying development and differentiation in plant and animal models, including humans. The aim of the course will also be to provide in-depth knowledge of molecular and in silico methodologies that allow the study of the interaction between genes belonging to developmental regulatory pathways.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral examination

Course: Plant cellular and molecular physiology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/04	**CREDITS:** 6
Course year: second	**Type of Educational Activity: C –** related or supplementary

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The course involves the study of the morpho-physiology, biochemistry and molecular biology of plants and growth regulators, in order to describe the molecular mechanisms of operation. Application aspects will be covered, such as the mechanisms underlying productivity control and plant biotechnologies

Objectives:
The training objective of the course is to provide theoretical-practical knowledge relating to the regulation of development and morphogenesis of plantS. The aim of the course will allow students to acquire in-depth knowledge on the regulation of the expression and morphogenetic development of higher plants. Particular attention will be paid to the role of photoreceptors and plant growth regulators from a molecular and cellular point of view in the main

phases of the development of plant organs. Understanding these mechanisms will help students to develop integrated specialist skills relating to the improvement of cultivated plants and methodological skills on responses to biotic and abiotic stresses in plants. Understanding these mechanisms will allow students to develop integrated specialist skills relating to the improvement of cultivated plants and methodological skills on responses to biotic and abiotic stresses in plants.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Curriculum Biology of Nutrition

Course: Food related organic molecules	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/06	**CREDITS:** 6
Course year: first	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Organic chemistry investigates carbon containing compounds both of natural origin or prepared by synthesis. Elucidation of the mechanisms by which organic compounds are formed and transformed in natural and enviromental systems, their supramolecular interactions and the structure-reactivity relationships are also main focus of the disciplinary sector	
Objectives: The main educational goal of this course is to provide fundamental knowledge of food components, their occurrence in commonly consumed food and their modifications due to cooking/industrial processing or storage and the implications of such processes on the nutritional power. The main food constituents will be presented together with the minor components responsible for the organoleptic properties of different food; functional foods, probiotics, prebiotics and additives for preserving quality and safety will be briefly introduced. A major goal will be to allow students to gain detailed knowledge of the issues of food storage and transformations and the relevant impact on the nutritional power. Understanding of the chemistry of food components and their spontaneous or processing-induced transformations will allow the students to gain ability to evaluate the nutritional power of food, its reinforcement or partial loss.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Biochemistry of nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/10	**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular and regulatory mechanisms of biotransformations, enzymatic catalysis, metabolism, fermentations, gene expression and regulation, signal transduction, intra- and intercellular communications; the biochemical bases of pathological states, food and nutrition of humans and other organisms.	
Objectives:	

Biochemical knowledge on the main nutrients and their interactions, their functional and modulatory value, metabolism and metabolic integration; in-depth knowledge of the biochemical/molecular and regulatory phenomena underlying human nutrition.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Plants and nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/02	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: "Systematic Botany has as its object the taxonomic and biological diversity of living and fossil plants - encompassing photosynthetic organisms, both prokaryotic and eukaryotic, fungi, and their respective symbionts - their evolution, and their relationships"; "Systematic Botany includes the survey and recognition and constitution of elementary taxa..."; "Tools of Systematic Botany include the acquisition, synthesis, and comparative analysis of … morpho-anatomical, histological, cytological, cytogenetic, phytochemical, genomic, and molecular information"	
Objectives: Students will acquire knowledge about food plants, focusing on their nutritional content, the main species used in human nutrition, and their systematic relationships. They will learn to identify food species and their edible parts, and to understand the importance of consuming vegetables in human diet.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Microbiology and Nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/19	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The BIO/19 sector studies the interactions of all microorganisms, including viruses, to understand biological processes. Other interests of the sector are the interactions with other organisms and the modifications induced by the interaction between microorganism and host; the development of the cellular and molecular bases of microbial pathogenicity; basic and applied microbiological techniques, including in the biotechnological field.	
Objectives: The course objective is to provide basic knowledge on the interactions between microorganisms and higher organisms. In particular, the complex microbial communities colonizing the human gastrointestinal system will be addressed. By understanding the molecular mechanisms underlying these interactions, the students will develop skills suitable for the evaluation of eubiosis and dysbiosis due to the microbiota. The role of microorganisms in the production of foods or their contamination will also be covered. The final goal of the course will be the acquisition of in-depth knowledge on the importance of the relationship between nutrition, microbiota, and human health.	
Propaedeuticities: None **Is a propaedeuticity for:** None	

Types of examinations and other tests: Oral and written examination

Course: Physiology of nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/09	**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the general fundamentals of endocrinology and evaluates the nutritional characteristics of the foods, the nutritional status, energy expenditure and intake, the physiological utilisation of nutrients of diet.	
Objectives: The course will be devoted to give the students theoretical and practical knowledge in the field of human nutrition. The course will be devoted to allow the students to attain deep knowledge regarding nutritional requirements in physiological and pathological conditions, thus allowing the students to develop advanced skills related to biomedical-nutritional sector.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Nutrigenetics and nutrigenomics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies the methods of transmission and expression of hereditary traits at the level of individual populations. It contributes to the development and applications of functional genomics methodologies. Studies the regulation of gene expression, epigenetic modifications and consequences at the phenotypic level. Investigates the genetic and molecular basis of hereditary diseases and the practical applications of genetics in the biomedical field.	
Objectives: The course aims to study the modes of transmission of monogenic and polygenic traits with relevance in the nutrition field. The course aims to provide knowledge of genomics, transcriptomics and epigenomics and their applications for nutrigenetics and nutrigenomics analyses. The course aims to provide the tools to understand the mechanisms underlying gene-nutrient interaction.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Applied nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/09	**CREDITS:** 8
Course year: second	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	

Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the general fundamentals of endocrinology and evaluates the nutritional characteristics of the foods, the nutritional status, energy expenditure and intake, the physiological utilisation of nutrients of diet.
Objectives: The course will be devoted to give the students theoretical and practical knowledge in the field of human nutrition. The course will be devoted to allow the students to attain deep knowledge regarding nutritional requirements in physiological and pathological conditions, thus allowing the students to develop advanced skills related to biomedical-nutritional sector.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Dietetics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/09	**CREDITS:** 6
Course year: second	**Type of Educational Activity: : B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the general fundamentals of endocrinology and evaluates the nutritional characteristics of the foods, the nutritional status, energy expenditure and intake, the physiological utilisation of nutrients of diet.	
Objectives: The course will give the theoretical knowledge required to students for the elaboration of optimal diets for subjects in healthy or physio-pathological conditions. The course of Dietetics will supply the practical capacities needed for the different steps of practical elaboration of an optimal dietary scheme.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Written examination	

Course: Redox homeostasis and nutrition	**Teaching Language:** Italian
SSD (Subject Areas): BIO/09	**CREDITS:** 6
Course year: second	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the general fundamentals of endocrinology and evaluates the nutritional characteristics of the foods, the nutritional status, energy expenditure and intake, the physiological utilisation of nutrients of diet.	
Objectives: The objective of this course is to provide knowledge on how nutrition furnishes the substances (antioxidants) for buffering the harmful effects of free radicals. The study of antioxidants of food interest, their content in foods of plant and animal origin, the mechanisms underlying assimilation and metabolism, and their specific antioxidant actions will be addressed.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Curriculum Forensic Biology

Course: Forensic Chemistry	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/01	**CREDITS:** 8
Course year: first	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The course aims to illustrate the main theories, methodologies, techniques and instrumentation to determine the qualitative and quantitative composition and structure of different samples of varying complexity, mainly in the field of forensics. In addition, all processes related to the pre-analytic stages (sampling, separation, enrichment, matrix changes) and the development and use of tools for the objective evaluation of the quality of the data obtained are studied in this area	
Objectives: The course aims to provide basic knowledge of analytical chemistry. The study of the main instrumental analytical techniques will be addressed. The aim of the course will be to allow students to acquire in-depth knowledge of analytical chemistry (extraction techniques, separative techniques, spectroscopic techniques and mass spectrometry). Through the understanding of the main techniques used in forensic analytical chemistry it will be possible to guide the student towards the development of specialized skills suitable for the assessment of the main issues that affect the outcome of a laboratory examination on forensic samples.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Forensic botany	**Teaching Language:** Italian
SSD (Subject Areas): BIO/01	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies Plant Biology at all levels of organization, including autotrophic prokaryotes, algae, fungi, and their symbioses. General Botany, among these organisms, theoretically and experimentally delves into aspects of structural and functional organization. It highlights the relationships among cytological, ultrastructural, histological, anatomical, morphological, organographic, and physiological aspects, as well as the role of secondary metabolites. Additionally, it explores the development and application of functional methodologies in relevant investigations and related biotechnological applications.	
Objectives: The course aims to provide basic knowledge on the application of botany in the investigation and resolution of legal issues. The objective of the course is to enable students to acquire in-depth knowledge of functional methodologies relevant to forensic botany investigations	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Forensic Zoology	**Teaching Language:** Italian

SSD (Subject Areas): BIO/05	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The study of metazoans and their evolution at the levels of cellular, organismic, and species organization. Research conducted through theoretical and experimental methodologies, both in the field and in the laboratory, investigates the functional organization, morphogenesis, development, systematics, and phylogeny of free-living and parasitic animals.	
Objectives: Providing students with basic knowledge and methodological tools to operate in the field of forensic zoology. Understanding the main taxa involved in forensic zoology at morpho-functional and taxonomic levels, with a specific focus on forensic entomology. Acquiring knowledge about the main operational settings in the forensic field and their zoological applications.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Forensic molecular biology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/11	**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular biology studies the biological functions at the molecular level of informational macromolecules. This field is interested in analysing interactions between nucleic acids and proteins, as well as between proteins themselves. Special attention is directed towards macromolecules involved in repairing, transcribing, and translating the information contained in nucleic acids. Additionally, focus is placed on macromolecules responsible for controlling gene expression, proliferation, cellular differentiation, and transformations.	
Objectives: The course aims to provide advanced knowledge in the field of molecular biology. We will address the study of cutting-edge techniques of molecular biology and bioinformatic approaches to be applied in the forensic field. By understanding the methods, it will be possible to guide the student towards the development of specialist skills suitable for the evaluation of investigations for forensic identification purposes.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Forensic Microbiology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/19	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course:	

Microbiological techniques. Interactions between microorganisms. Complex microbial populations. Interaction between bacteria and host.
Objectives: The course will aim to increase the student knowledge in the bioinformatics (16S amplicon sequencing) and microbiology fields. By understanding these methodologies, the student will be guided towards the development of skills for forensic identification purposes.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Forensic biochemistry	**Teaching Language:** Italian	
SSD (Subject Areas): BIO/10		**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biochemical methodologies for the identification, characterization and analysis of biomolecules; recombinant molecular technologies for engineering proteins and organisms; molecular and recombinant biotechnologies and biochemical and biotechnological applications.		
Objectives: Acquisition of skills in advanced biochemistry applied to the analysis of biological macromolecules of interest for forensic applications and the most modern instruments used for their identification, isolation, characterization and quantification.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Quality and safety in laboratories	**Teaching Language:** Italian	
SSD (Subject Areas): MED/42		**CREDITS:** 6
Course year: second	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector focuses on scientific and educational activities in the field of general and applied hygiene; the sector has specific expertise in applied hygiene in the workplace, preventive medicine, programming, organization, and management of health services.		
Objectives: The course aims to provide knowledge on risk assessment, epidemiological analysis, and understanding risk descriptors. Students will acquire in-depth knowledge of risk analysis techniques and legislation for the protection of supply chains, developing the ability to assess both qualitative and quantitative risks in production processes.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral and written examination		

Course: Forensic genetics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 8
Course year: second	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies the structure and evolution of genes and genomes also at a computational and bioinformatic level. It investigates the genetic and molecular bases of evolution and the practical applications of genetics, and the molecular technologies derived from it.	
Objectives: The teaching of Forensic Genetics aims to provide the student with the knowledge of the principles of genetics necessary for the application of this discipline in forensic contexts. Starting from the basics of classical genetics and population genetics, the student will be guided towards understanding the issues relating to individual genetic typing which currently represents a powerful tool in the practice of forensic investigations	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Criminal legal aspects in forensic investigations	**Teaching Language:** Italian
SSD (Subject Areas): IUS/17	**CREDITS:** 6
Course year: second	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Concerning forensic investigations, the sector studies the general theory of crime and punishment, different articulations of criminal law, and criminology as regards the aspects of more legal relevance.	
Objectives: The teaching will focus on the “general part” of criminal law and, therefore the constitutional principles that regulate the subject and the fundamental institutions of the theory of crime. Concerning the criminal trial, it will deal with the profiles of the first-degree criminal proceedings appeals and appeals. Naturally, the place and relationship of forensic biological investigations with the principles of law and criminal proceedings will be highlighted.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Curriculum Cell biology applied to the health and aesthetics of the skin

Course: Cellular and applied biology of the skin	**Teaching Language:** Italian
SSD (Subject Areas): BIO/13	**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course:	

Cell and applied biology study fundamental mechanisms regulating homeostasis and development of tissues and of living organisms. Furthermore, promotes the strengthening of biotechnological applications and their technology transfer. The learning path of cell and applied biology is focused on generating and characterizing *in vivo*, *in vitro* and *ex vivo* models using advanced genetic engineering.
Objectives: During the course, the skills necessary for the generation of conventional and innovative cellular models will be provided. The role that the cellular microenvironment plays in the process of development and differentiation of the skin and the methodologies useful for understanding the molecular and cellular mechanisms that regulate its pathophysiology will be addressed.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Biochemistry and molecular adaptations to cellular alterations		**Teaching Language:** Italian
SSD (Subject Areas): BIO/10		**CREDITS:** 8
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Gene expression and regulation, signal transduction, intra- and intercellular communications. Biochemical bases of pathological states. Biochemical specificities of cells, tissues, organs.		
Objectives: The course aims to provide knowledge of the basic molecular mechanisms and adaptation processes of the skin as well as giving details into biochemical processes such as synthesis of keratin, collagen and elastin, redox homeostasis and modifications of dermal proteins during senescence processes.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Anatomy and Histology of the skin		**Teaching Language:** Italian
SSD: BIO/06		**CFU:** 6
Course year: first	**Type of Educational Activity: B** - characterizing	
Teaching methods: In person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the sector represent an integrated set of skills that addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.		
Objectives: The scientific sector offers an integrated set of skills that address the problem of form in animal biology, at its different levels of organization and in the dual structural and embryological-evolutionary perspective. The disciplinary sector		

includes animal cytology and histology, comparative anatomy, cell biology, developmental and evolutionary biology of vertebrates.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Genetics and molecular biology of the skin		**Teaching Language:** Italian
SSD (Subject Areas): BIO/18 BIO/11		**CREDITS:** 6 6
Course year: first	**Type of Educational Activity: B –** characterising **B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The BIO/18 sector studies the methods of transmission, modification, and expression of hereditary characteristics at the level of cells, individuals, and populations. The sector also studies the regulation of gene expression and epigenetic modifications and their consequences at a phenotypic level. The sector investigates genetic and molecular bases of development, immune response, and hereditary diseases as well as the practical applications of genetics and the molecular technologies derived from it in the biomedical, pharmaceutical, and industrial sectors. The BIO/11 sector studies the biological functions of informational macromolecules at the molecular level. Particular attention is paid to the macromolecules that are involved in the transcription and translation of the information contained in nucleic acids, to the macromolecules that are responsible for the phenomena of control of gene expression, proliferation, differentiation and cellular transformation, to the macromolecules that allow cell movement, interactions and development of multicellular organisms.		
Objectives: Advanced knowledge will be provided on the molecular mechanisms regulating regeneration, proliferation, and cellular differentiation in the skin. The course will extensively explore signal transduction mechanisms and the regulation of gene expression during both embryonic development and adulthood. Additionally, the course aims to understand advanced molecular strategies for the therapy of skin pathologies.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Physiology of the skin		**Teaching Language:** Italian
SSD (Subject Areas): BIO/09		**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the human vital functions and analyses how the living organism maintain homeostasis of its internal medium at molecular, cellular and tissue level.		
Objectives: The course aims to provide knowledge on skin physiology and describe in depth the specific functions and activities carried out by this complex organ and the associated structures for the well-being of the organism.		
Propaedeuticities: None **Is a propaedeuticity for:**		

None
Types of examinations and other tests: Oral examination

Course: Microbiota and skin well-being	**Teaching Language:** Italian	
SSD (Subject Areas): BIO/19		**CREDITS:** 6
Course year: first	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies the classification, physiology, and interactions of all microorganisms, including viruses, for understanding biological processes. Other interests of the sector are interactions with other organisms and the changes induced by the interaction between microorganisms and host; the development of the cellular and molecular bases of microbial pathogenicity; and basic and applied microbiological techniques, including in the biotechnological field.		
Objectives: The course aims at providing basic knowledge on the complex microbial communities that make up the human microbiota, focusing on the skin and intestine, and the techniques used to study it. The knowledge acquired will allow students to understand the key role of the microbiota not only in digestive processes but also in immunomodulatory ones, in the homeostasis and etiopathogenesis of intestinal and skin diseases, as well as the interaction between nutrition - microbial eubiosis/dysbiosis and skin well-being. The final goal will be to understand how the modulation of the intestinal and skin microbiota can influence the health of the skin and its appendages.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral and written examination		

Course: Hygiene, quality and safety in laboratories	**Teaching Language:** Italian	
SSD (Subject Areas): MED/42		**CREDITS:** 6
Course year: second	**Type of Educational Activity: B –** characterising	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector is involved in scientific and educational activities in the field of general and applied hygiene; the sector has specific expertise in the field of hygiene applied to workplaces, food hygiene, community and social medicine, and public health.		
Objectives: The course aims to provide knowledge on principles of hygiene, quality, and safety in laboratories, with a specific focus on the well-being and aesthetics of the skin. Objectives include learning hygiene practices for supplements, personal care products, and food.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Nutrition and well-being of the skin	**Teaching Language:** Italian
SSD (Subject Areas):	**CREDITS:**

BIO/09	6
Course year: first	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physiology studies the human vital functions and analyses how the living organism maintain homeostasis of its internal medium at molecular, cellular and tissue level.	
Objectives: The course aims to provide knowledge on the role played by nutrition in the maintenance of the specific functions and activities carried out by this complex organ and the associated structures.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Natural substances for skin wellbeing	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/06	**CREDITS:** 6
Course year: first	**Type of Educational Activity: C –** related or supplementary
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies carbon compounds of natural and synthetic origin. It develops the study of phytochemical aspects and the isolation, structural characterisation, and synthesis of organic substances of animal, plant, and marine origin, including those with biological activity.	
Objectives: The course aims to provide knowledge on the most important classes of natural organic substances and in particular their structure and structure-activity correlation. In addition, the course aims to provide knowledge on a) the techniques used for their isolation and their chemical and biological characterization; b) the synthesis of derivatives and/or analogs for the modulation of their activity and specificity aimed at potential practical application for the well-being and aesthetic of the skin and their derivatives.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

At the student's choice courses

Course: Structural Biology of Proteins	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/03	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: General and inorganic chemistry focuses on the design and development of methodologies of synthesis and structural characterization, through spectroscopic techniques, of innovative materials, and on the structure-properties relationships.	
Objectives:	

The course aims to provide the students with theoretical and practical knowledge of advanced experimental techniques for the determination of the structure of proteins at high resolution, in a vision that ranges from the conformation of the single molecule to the structure of amyloid aggregates and functional protein complexes.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Methods in biophysical chemistry		**Teaching Language:** Italian
SSD (Subject Areas): CHIM/02		**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physical Chemistry aims to describe, at both the macroscopic and atomic-molecular levels, the structure, properties and transformations of matter. Relying increasingly on the development of experimental and computational methodologies, it aims at building models for interpreting and predicting experimental parameters and solving problems related to complex systems of biological interest.		
Objectives: The objective of the course is to provide basic knowledge of biophysical methods of optical spectroscopy and calorimetry. We will address the study of some experimentally measurable properties such as enthalpy, light absorption, and emission with their potential applications. The course aims to provide the student with the information necessary to understand the main methods of optical spectroscopy and calorimetry applied to the study of biological systems. The aim of the course will be to allow learners to acquire in-depth knowledge of some spectroscopic and calorimetric methods for the study of molecular properties and their interactions. By understanding the methods of investigation, it will be possible to guide students towards the development of specialized skills suitable for the evaluation of the experimental strategies to solve practical problems.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Glycobiology		**Teaching Language:** Italian
SSD (Subject Areas): CHIM/06		**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector deals with organic compounds and biomolecules based on carbohydrates and their organic derivatives, of natural and synthetic origin, and their structural elucidation and also the structure-reactivity relationships.		
Objectives: The student must demonstrate basic knowledge of carbohydrate chemistry and glycobiology to be able to tackle the study of the biological properties of glycoconjugates.		
Propaedeuticities: Organic Chemistry **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Biochemical - clinical analyses	**Teaching Language:** Italian
SSD (Subject Areas): BIO/10	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Biochemical methodologies for the identification, characterization and analysis of biomolecules. Biochemical bases of pathological states. Biochemical and biotechnological applications offered by all the skills listed above regarding proteins, nucleic acids, lipids, and sugars in the medical field	
Objectives: The objective of this course is to provide students with the skills to work in a healthcare diagnostic laboratory.	
Propaedeuticities: Biochemistry and laboratory; Physiology and laboratory **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Molecular Biology of Cancer	**Teaching Language:** Italian
SSD (Subject Areas): BIO/11	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular Biology of Cancer studies the biological functions at the molecular level of tumour growth and formation. Particular attention is focused on the most commonly altered molecular pathways in tumours, receptors, transcription factors, the role of oncogenes, tumour suppressors, and carcinogens, next-generation targeted therapies, resistance mechanisms, and the epigenetics of cancer.	
Objectives: The objective of the course is to provide the students with the basis for understanding the molecular and cellular mechanisms related to tumour development and progression, from the initial stages to progression toward invasion and metastasis.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Industrial Biochemistry	**Teaching Language:** Italian
SSD (Subject Areas): BIO/10	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Molecular and regulatory mechanisms of biotransformations, enzymatic catalysis, metabolism, fermentations, the biochemical mechanisms of prokaryotic cell functions, recombinant molecular technologies for engineering proteins and organisms; industrial biochemistry, microorganisms, products of biotechnological origin, molecular and	

recombinant biotechnologies and the biochemical and biotechnological applications offered by all the skills listed above at the protein level in the industrial field.
Objectives: The objective of the course is to provide the student with the necessary tools to understand the biochemical mechanisms that underlie industrial processes and apply them in order to be able to design, analyze and produce on a large scale biomolecules useful in the chemical, pharmaceutical, cosmeceutical and food.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Endocrinology applied to illicit drugs.		**Teaching Language:** Italian
SSD (Subject Areas): BIO/06		**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice	
Teaching Methods: In-person teaching		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines included in the field represent an integrated set of skills that addresses the problem of form in animal biology, in a structural and embryological-evolutionary perspective. The fundamental correlations between the molecular, cellular, tissue and organ levels, and the modifications determined by the environmental alterations, are studied. It is studied, with a comparative approach, the interconnection between structure, function, and adaptation, in various processes such as endocrine and neural integration, reproduction, development, immune defence.		
Objectives: The Teaching proposes the study of: 1) the role of illicit drugs in human history; 2) their characteristics and effects on endocrine and nervous systems, peripheral organs and tissues; 3) the role of illicit drugs as environmental contaminants, and their effects on the environment and animal organisms coming into contact with them.		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Oral examination		

Course: Comparative Endocrinology		**Teaching Language:** Italian
SSD: BIO/06		**CFU:** 6
Course Year: first/second	**Type of Educational Activity: D –** at student's choice	
Teaching Methods: In person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplines of the sector costitute an integrated set of skills and address the study of form in animal biology, at its different levels of organization and in the dual structural and embryological-evolutionary perspective. The fundamental correlations between the molecular, cellular, tissue and organological levels are explored in depth, including the modifications caused by environmental alterations. From an embryological-evolutionary point of view, the relationships between phylogeny and morphogenesis are studied, to identify at various levels, also with a comparative approach, the interconnection between structure, function and adaptation, in various processes such as reproduction, development, endocrine and neural integration, immune defense.		
Objectives: The course will provide students with the appropriate tools to understand the relationships mediated by the endocrine system between different anatomical and functional organs and between the latter and the environment. The course will deepen into the evolutionary processes that have led to the modifications of the endocrine system in the different classes of vertebrates.		

Propaedeuticities: None **Is a propaedeuticity for:** Nonr
Types of examinations and other tests: Oral examination

Course: Enzymology	**Teaching Language:** Italian
SSD (Subject Areas): BIO/10	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Enzymatic catalysis and biochemical and biotechnological applications offered by proteins.	
Objectives: The course aims to provide students with specialized knowledge of biochemistry, applied to the study of enzymes including their applicability in biotechnological contexts (e.g. industrial and medical).	
Propaedeuticities: Biochemistry and laboratory **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Cancer genetics and epigenetics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies the regulation of gene expression and the mechanisms of mutagenesis and epigenetic modifications by analyzing the molecular bases, the inheritance mechanisms, and the consequences at the phenotypic level.	
Objectives: The course aims to provide students with the knowledge and concepts useful for understanding the fundamental aspects that define the genetic and epigenetic mechanisms underlying tumor transformation and its progression towards more severe and aggressive phenotypes. Furthermore, the student will get insights into the technological and molecular approaches used to analyze the tumor cell for genetic and epigenetic lesions and will be trained to ask and solve scintific questions concerning some key aspects of cancer biology.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Genetics and evolutionary genomics	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	

Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector studies the regulation of gene expression and the mechanisms of mutagenesis and epigenetic modifications by analyzing the molecular bases, the inheritance mechanisms, and the consequences at the phenotypic level.
Objectives: The course aims to provide students with the knowledge and concepts useful for understanding the fundamental aspects that define the genetic and epigenetic mechanisms underlying tumour transformation and its progression towards more severe and aggressive phenotypes. Furthermore, the student will get insights into the technological and molecular approaches used to analyze the tumour cell for genetic and epigenetic lesions and will be trained to ask and solve scientific questions concerning some key aspects of cancer biology.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

Course: Hygiene and safety in healthcare	**Teaching Language:** Italian
SSD (Subject Areas): MED/42	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The sector focuses on scientific activities in general and applied hygiene; the sector has specific expertise in the field of epidemiology, public health, programming, organization, and management of health services, and health education.	
Objectives: The course aims to educate students on hygiene and safety in the healthcare sector, with a focus on infection prevention and safety promotion. Objectives include understanding concepts, identifying risks, learning preventive measures, and awareness of regulations.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: School hygiene and environmental hygiene	**Teaching Language:** Italian
SSD (Subject Areas): MED/42	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
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; the sector has specific expertise in applied hygiene in the environment and school hygiene.	
Objectives: The course provides the fundamentals of School Hygiene, focusing on procedures and hygienic practices to promote safety and health in school environments. Students will acquire skills to apply principles of prevention and protection, explore the epidemiology of school-related diseases, and analyze preventive strategies.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests:	

Oral examination

Course: Mathematical method and models	**Teaching Language:** Italian
SSD (Subject Areas): MAT/07	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Skills relating to the study, from both a theoretical and applicative point of view, of dynamic systems, using both analytical and geometric techniques**.**	
Objectives: Illustrate how and why mathematical models are built. Provide examples of mathematical models for dealing with problems from biology, ecology and natural sciences in general.	
Propaedeuticities: Mathematics **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Principles of Bioinformatics for genetic analyses	**Teaching Language:** Italian
SSD (Subject Areas): BIO/18	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The disciplinary scientific sector aims to analyze the structure and evolution of genes and genomes, developing and using methodologies also at a computational and bioinformatic level for the study of genomes and their functioning	
Objectives: The course aims to provide the basic cognitive elements for bioinformatic analyzes of genomic and transcriptomic sequences. Students will be provided with a set of basic computational tools, through theoretical and practical lessons, for the "in silico" analysis of the information produced by new generation sequencing of genomes and their transcribed portion.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination	

Course: Properties of dermocosmetic formulations	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/02	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Physical Chemistry aims to describe, both at a macroscopic and atomic-molecular level, the structure, properties and transformations of matter. Based increasingly on the development of experimental and computational methodologies, it aims to build models for the interpretation and prediction of experimental parameters and to solve problems relating to complex systems of chemical, physical and biological interest	

Objectives:
Knowledge of the right composition of the various ingredients to obtain formulations that satisfy a particular application or need. Knowledge of the basic aspects in creating a formulation and the forces involved and methods of stabilization of colloidal systems. Knowledge of cosmetic raw materials: oils, fats, waxes, rheological modifiers, surfactants, emulsifiers, preservatives, sun products. Study of vehicles for cosmetic formulations: solutions, suspensions, emulsions (multiple and micro-emulsions), liposomes, nanoparticles. Detergents: ingredients present, main classes of anionic, cationic, non-ionic and amphoteric surfactants. Chemical-physical control of cosmetic forms. Evaluation of the stability of cosmetic products. In vitro and in vivo safety tests

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral examination

Course: Cytological and histological techniques	**Teaching Language:** Italian
SSD (Subject Areas): BIO/06	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice

Teaching Methods:
In-person

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 addresses the problem of form in animal biology, at its various levels of organization and in the dual structural and embryological-evolutionary perspective. From a structural point of view, with the use of advanced microscopic techniques, the fundamental correlations between the molecular, cellular, tissue and organological levels, the possible application aspects of biotechnology and the modifications determined by environmental alterations are explored in depth. The sector includes, as characterizing disciplines, animal cytology and histology, cell biology, comparative anatomy, developmental biology and evolutionary biology of vertebrates.

Objectives:
The course aim to provide knowledge for understanding microscopy techniques: nature and behavior of light, imaging, preparation of biological material, together with the motivations for the execution of the different types of techniques, in relation to the type of study and optical instruments used.

Propaedeuticities:
Cytology and histology
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral examination

Course: Techniques for the analysis of molecules of biological and laboratory-synthetic interest	**Teaching Language:** Italian
SSD (Subject Areas): CHIM/06	**CREDITS:** 6
Course year: first/second	**Type of Educational Activity: D –** at student's choice

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The sector studies molecules of biological interest, both of natural and synthetic origin, including amino acids and their polymers, lipids and sugars. The course focuses on the main techniques of isolation, purification and structural characterization, as well as the structure-function relationships of organic compounds with biological activity.

Objectives:
The course aims to provide students with theoretical and practical knowledge a) on the main techniques used for the isolation and analysis of organic compounds of biological interest from natural matrices; b) on common spectroscopic techniques such as UV, IR, NMR and mass spectrometry used for the structural characterization of simple organic

compounds of biological interest; c) on the basic principles relating to the interpretation of their spectroscopic data. The course will be integrated with laboratory exercises on the topics covered.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: Oral examination

ANNEX 2.2

DEGREE PROGRAM DIDACTIC REGULATIONS

BIOLOGY

CLASS LM-6

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	
Types of examinations and other tests: aptitude	

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