



UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Biological, Chemical and Pharmaceutical Sciences and Technologies

A.Y. 2022/2023

DEGREE COURSE IN CONSERVATION BIOLOGY

Characteristics



Class of Master's Degree (MSc) on Biology (LM-6)



2 YEARS



PALERMO



FREE ACCESS



2261

Educational objectives

The 2nd cycle degree programme in COBI provides specific training with respect to the management and preservation of biota. The foremost objective of the 2nd cycle degree programme is to train experts in the management and protection of species and biocenosis, with advanced knowledge of both biological systems and biodiversity analysis techniques.

The 2nd cycle degree programme in COBI deepens the learning of the techniques and methods for the identification and the analytical study of the biotic component and its response to the anthropic pressures on the environment. The COBI programme aims therefore at integrating basic biological training, focusing on application issues such as the morpho-functional and eco-physiological adaptations to the environment, the species-area relations, the response of living beings to environmental alterations. Furthermore, the COBI programme aims at learning useful techniques for biological monitoring, through direct measurements or indirect estimates, as well as the acquisition and treatment of biological data for management purposes. The analysis of biota will be finally integrated with notions on legal regulations and economic aspects, which are essential for a sustainable and judicious management of biocoenoses.

The educational programme consists in two six-month cycles of frontal teachings, supported by field and laboratory practice. Learning is counted in credits-hours.

With the aim of promoting a cultural training and professional expertise better suited to the specific interest of individual students, flexible training paths are provided, which can be adapted to different needs. In fact, in the second course year, a significant part of students activity focuses on activities related to the experimental thesis, to be carried out with institutions involved in the preservation of species and biotic communities, to gain useful experience to fit in research activities as well as in the labour market.

The final programme goal is to offer students, through a significant experimental laboratory and field work experience, the possibility to acquire the cultural tools and the methods needed to carry out research activity and to manage preservation and conservation plans. In a few words, the main objective is the ability to combine diversified skills for data collection, planning and implementation of useful plans to manage, enhance and protect the living component of ecosystems.

The 2nd cycle degree programme in COBI also provides an adequate cultural basis for any prosecution in advanced training, with PhD courses.

Specific educational objectives

2nd cycle graduates in COBI acquire good command of the scientific method applied to the analysis of negative anthropic effects upon animal and vegetal organisms, and are able to produce conservation project suitable for the mitigation of negative anthropic effects and/or the protection and restoration of a balance in biocenoses, thanks to the acquisition of integrated knowledge in five large areas:

- i) Basic biological knowledge of organisms, from their classification to the main evolutionary mechanisms and the main threats upon them.
- ii) Methods and technologies used in the field study and/or sampling of organisms.
- iii) Ethological, physiological, molecular, and microbiological methods to analyse the anthropic effects upon species and communities.
- iv) Economic and juridical regulations in force about the environment, with respect, in particular, to the principles regulating the implementation of the European Union environmental policies.
- v) Ability to prepare and implement environmental protection plans through the integration of the knowledge acquired in the aforementioned four areas.

Professional opportunities

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

Profile:
Conservation biologist

Functions:

Conservation biologists combine the ability to collect and analyse environmental biological data with the ability to design, or find useful technological solutions for, the monitoring, conservation, recovery and restoration of ecosystems. These professionals operate within or for public bodies or private companies, with the objective of identifying methods and solutions for the conservation of habitats and the preservation of ecosystemic services, including the design and implementation of green urban infrastructures and ecological networks.

Their activity aims at improving the richness of biota, both in natural and anthropized contexts, by mitigating the impact stemming from human activities and from the infrastructures connected to productive, technological and settlement systems. Furthermore, their solid background in botany, zoology and microbiology, ensured by the class-specific exams, enables them to carry out research activities in the botanical or zoological field at research agencies, as well as to take the role of conservator in museums and bodies hosting in vivo or ex vivo biological collections.

Skills:

- Ability to collect and analyse biological data, with particular reference to biodiversity and physiological status of living organisms.
- Ability to plan and manage complex computer systems with respect to biological data and topics, possibly related to abiotic parameters.
- Ability to produce theme-specific and biological-naturalistic maps, also using GIS, remotely sensed data and connected databases.
- Ability to plan and implement environmental monitoring techniques based on the use of living organisms as indicators.
- Basic knowledge in the field of planning and implementation of action for naturalistic requalification and green infrastructures, for the reduction of mitigation of anthropic impact.
- Basic knowledge of statistical data analysis with respect to species quantity and distribution.
- Basic knowledge of the economic and juridical traits of biodiversity conservation.

Professional opportunities

- Study, protection and management of biodiversity and biotic resources in natural and anthropized ecosystems.
- Botanist or zoologist in parks, museums, zoological gardens, protected areas and other agencies for in situ and ex situ protection of biodiversity.
- Inventory and management of animal and plant species.
- Consultancy in national and international projects for the protection of species, habitats and biocoenoses.
- Design of restoration plan.
- Creation and management of complex databases, related to biotic and abiotic data.

Profile:

Environmental biologist

Functions:

Environmental biologists carry out environmental analyses, protection, and management. Their skills enable them to perform analyses on the quality and healthiness of the human-biota interaction, monitoring the effects of climate change and of anthropic impacts upon animal and vegetal organisms and microorganisms. Furthermore, coordinating with different and/or complementary profiles, such as architects, engineers and geologists, they may participate in the preparation of environmental impact assessments (EIA), environmental implications assessment (VINCA) and strategic environmental assessment (VAS). Graduates in Conservation Biology may also carry out all the specific professional, managerial and research functions duties of biologists with solid botanical, zoological and ethological groundings, ensured by the class-specific exams and by their field and laboratory experiences. They may, finally, carry out their professional activity in educational institutions, universities, management and administration agencies, with specific reference to the environmental management and control.

Skills:

- Promotion and application of bio-monitoring techniques for the identification of the effects of environmental alterations of natural and anthropic origin, upon organisms, populations and biocoenoses, as well as for the design and management of biological monitoring networks, through the use of biological organisms, both as indicator and as bio-accumulators.
- Set-up of environmental analysis technologies, development of biosensors and bio-toxicological assay.
- Analysis of the effect of xenobiotics upon the environment and the behaviour of animal and plant species.
- Microbiological analyses for the environmental quality assessment.
- Environmental rehabilitation using plant species.
- Environmental prevention and knowledge of the main environmental regulations.
- Design and implementation of environmental impact assessment, also economic, of production and settlement systems, with respect, in particular, to biotic aspects.
- Basic knowledge of the economic and juridical aspects of biocoenosis management and preservation.

Professional opportunities:

- Scientific activities at public and private institutions: universities, local and administrative authorities for environmental and health management (regional, provincial, communal administrations, Regional Agencies for Environmental Protection-ARPA, Local Healthcare agencies, National Institute for Environmental Protection and research – ISPRA)
- Professional activity in associate professional firms for territorial planning and design, environmental monitoring, certification and restoration.
- Professional activity in agricultural firms carrying out integrated pest control and/or organic farming.

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

- Professional activity through the application of the aspects of environmental regulations requiring field biological skills with respect, in particular, to impact studies (flora and fauna sector).

Profile:

Conservation biology communicator

Functions:

These professionals are characterised by skills enabling them to carry out research and monitoring activities on species and biotic communities, together with the popularisation of environmental knowledge, aiming at raising awareness on the importance of biodiversity and ecosystems conservation issues, as well as on the economic and ecological services provided, not least public health prevention. Furthermore, these professionals may carry out management functions in protected natural areas as well as in scientific/interpretive facilities, such as museums, aquariums, botanical gardens, zoological gardens, parks and protected areas. These professionals may also carry out the planning and organisation of events of scientific dissemination, such as “citizen science” initiatives, namely related to biological issues and to the conservation and defence of biotic communities.

Finally, they may work as professional advisors in the editorial offices and the media involved in the scientific communication of territorial research results. Graduates who possess enough credits in specific groups of scientific sectors will be able to participate in competition procedures for accessing to teaching in schools, in accordance with current legislation.

Skills:

- Ability to manage and coordinate field research and monitoring, as well as laboratory and collections in protected areas, museums, Aquariums, zoological gardens, botanical gardens.
- Technical skills, including computing skills, in the creation and cataloguing of collections of biological/naturalistic samples and of the interactive identification of animal and plant species.
- Ability to plan and management facilities and itineraries for disseminating and sensitising about the importance of biocoenoses and for the promotion of best practices to prevent negative effects on the biotic component of ecosystems and on public health.
- Skills related to the methods of promotion and implementation of naturalist-touristic educational projects.
- Communication skills for the scientific dissemination and communication, including multimedia.
- Popularisation and dissemination of the results of research through adequate publication activity.

Professional opportunities:

- Professional activity in environmental protection and scientific dissemination services, both in the public and private sector.
- Monitoring, also “citizen science” initiatives, of species and biocoenoses.
- Access to competitive selections for public and private school teachers.
- Educational activities related to environmental education.
- Organisation and management of public and private scientific/communication facilities.

Final examination features

The final examination includes a research period, related to topics consistent with the educational programme of the degree course, to be carried out at a university laboratory or at an agreed laboratory of a public or private external body, under the guidance of a supervisor, namely a professor of the COBI degree programme, appointed by the COBI Board on student’s proposal. Depending on specific needs, one or more co-supervisors may also be appointed, even external to the COBI Board. Normally, the research activity is carried out during the second semester of the second year, but in some cases approved by the COBI Board, this activity might also start earlier. Through the activity aimed at the preparation of the final examination, students acquire knowledge of the methodology, the analytical tools and of the techniques of data collection and processing, and prepare an experimental dissertation of biological interest, bringing an original contribution to scientific knowledge in the specific field. The presentation of a written paper (thesis) is foreseen. The final examination is completed with the thesis defence during the graduation session.

Subjects 1 ° year	CFU	Sem.	Val.	SSD	TAF
21837 - BIOLOGY AND CONSERVATION OF INVERTEBRATES - INTEGRATED COURSE	9	1	V		
- ENTOMOLOGY APPLIED TO CONSERVATION <i>Lo Verde(PA)</i>	3	1		AGR/11	C
- INVERTEBRATE BIOLOGY AND CONSERVATION <i>Arizza(PO)</i>	6	1		BIO/05	B
21766 - BIOLOGY AND CONSERVATION OF PLANTS AND MEDITERRANEAN ECOSYSTEMS <i>Guarino(PA)</i>	6	1	V	BIO/03	B
21752 - ETHOLOGY AND CONSERVATION <i>Campobello(PA)</i>	6	1	V	BIO/05	B
21763 - EVOLUTION AND CONSERVATION <i>Marrone(PO)</i>	6	1	V	BIO/05	B

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

Subjects 1 ° year	CFU	Sem.	Val.	SSD	TAF
21764 - VERTEBRATE BIOLOGY AND CONSERVATION <i>Vecchioni(RD)</i>	6	1	V	BIO/05	B
21767 - BIOMOLECULAR METHODS APPLIED TO CONSERVATION - INTEGRATED COURSE	6	2	V		
- ANIMAL DIVERSITY ANALYSIS <i>Marrone(PO)</i>	3	2		BIO/05	C
- MICROBIOTA ANALYSIS <i>Alduina(PA)</i>	3	2		BIO/19	C
21769 - CONSERVATION PHYSIOLOGY - INTEGRATED COURSE	12	2	V		
- CONSERVATION PHYTOPHYSIOLOGY <i>Oddo(RU)</i>	6	2		BIO/04	B
- ECOPHYSIOLOGY AND ANIMAL WELFARE <i>Zizzo(PA)</i>	6	2		BIO/09	B
16163 - ENVIRONMENT LAW	6	2	V	IUS/14	B
21829 - ENVIRONMENTAL ECONOMICS AND EUROPEAN GREEN DEAL	6	2	V	SECS-P/06	B

63

Subjects 2 ° year	CFU	Sem.	Val.	SSD	TAF
21832 - FAUNAL CONSERVATION AND MANAGEMENT - INTEGRATED COURSE	9	1	V		
- DISSEMINATION AND CITIZEN SCIENCE APPLIED TO CONSERVATION <i>Campobello(PA)</i>	3	1		BIO/05	C
- FAUNAL CONSERVATION AND MANAGEMENT <i>Lo Valvo(PA)</i>	6	1		BIO/05	B
21833 - FLORA CONSERVATION AND MANAGEMENT - INTEGRATED COURSE	9	1	V		
- FLORA CONSERVATION AND MANAGEMENT <i>Troia(RD)</i>	6	1		BIO/03	B
- GEOGRAPHIC INFORMATION SYSTEMS (GIS) IN CONSERVATION BIOLOGY <i>Bazan(PA)</i>	3	1		BIO/03	C
20691 - ENGLISH LANGUAGE SKILLS - EQUIVALENT TO LEVEL B2	3	1	G		F
13121 - PRACTICE	6	2	G		F
05917 - FINAL EXAMINATION	15	2	G		E
18182 - INTERNSHIP AND PRACTICE	6	2	G		S
Free subjects (suggested)	9				D

57

OPTIONAL SUBJECTS

Free subjects (suggested)	CFU	Sem.	Val.	SSD	TAF
21754 - AVIFAUNA CONSERVATION <i>Sara'(PA)</i>	9	1	V	BIO/05	D
21755 - SAMPLING METHODS - INTEGRATED COURSE	9	1	V		
- FLORA AND VEGETATION <i>Guarino(PA)</i>	6	1	V	BIO/03	D
- INLAND WATER FAUNA <i>Marrone(PO)</i>	3	1	V	BIO/05	D

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)