



DEPARTMENT OF **ECOLOGICAL AND BIOLOGICAL SCIENCES**



DEPARTMENT HANDBOOK
ACADEMIC YEAR 2019 / 2020



UNIVERSITÀ
DEGLI STUDI DELLA
Tuscia

DEB
DEPARTMENT
OF ECOLOGICAL AND
BIOLOGICAL SCIENCES

Department handbook
2019 / 2020

The courses
Second cycle degree courses
Postgraduate study



INDEX

Welcome from the Head of Department 4

COURSES - ACADEMIC YEAR 2019/2020 6

Degree courses 7

Biological sciences 7

Environmental sciences (Civitavecchia Campus) 11

Second-level degree courses 16

Cellular and molecular biology 16

Industrial biotechnology for health and wellbeing 19

Marine biology and ecology (Civitavecchia campus) 23

Postgraduate studies 27

Research 29

USEFUL INFORMATION 30

OFFICES AND STUDENT SERVICES 32

ACADEMIC CALENDAR 33

DEPARTMENT 34

Department structure 34

Department personnel 35

WELCOME

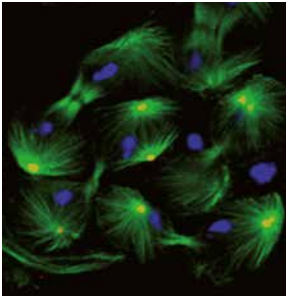


Professor Giorgio Prantera
Head of Department

Dear Students, It is with great pleasure that I welcome you to the University of Tuscia. I am the Director of the Department of ecological and biological sciences, which you will learn to refer to as DEB. University departments are the hub of the didactic and research activities, which together represent the starting point of the cultural and professional growth of university students. University courses offer two successive degree courses: a first level three year degree course and a second level two year degree course, providing a specialised and in-depth training for some of the subjects studied during the first level degree course. DEB offers four degree courses: a first level course in Biological Sciences, providing a solid foundation in all the sectors of biology. Its natural progression is the second level degree course in Cellular and molecular biology, which provides in-depth knowledge of the latest aspects of biomolecular research, and the first level course in Biological Environmental Sciences, which allows students to acquire fundamental competences in the different areas of biology as well as studying the different aspects related to the interaction between human beings and the environment. These can also be studied further during the second level degree course in Marine biology and ecology, especially as far as the marine and coastal environment goes. This specialised degree course also includes a double diploma in Marine Environment and Biology with Moscow's RUDN University (Sochi campus). Those who wish to go into research can enrol on the PhD course in Ecology and Sustainable Management of Environmental Resources. Those who wish to go into research can enrol on the PhD course in Ecology and Sustainable Management of Environmental Resources. The didactic activities of the Biology degree and Cellular and molecular biology degree, including theses, take place in DEB's classrooms and laboratories in Viterbo, located in the Riello campus, and also in the Faculty of Agriculture. On the contrary, the didactic activities of

the Biological Environmental Sciences degree course and the Marine biology and ecology course take place the DEB department in Civitavecchia, at the LOSEM (Laboratory of Experimental Oceanology and Marine Ecology) in Civitavecchia and CISMAR (Experimental Ichthyogenic Center) at the Saline di Tarquinia.

The three-year degree course and the second level degree course offered by DEB train highly skilled technicians and professionals in the environmental and biological sectors. Graduates in Biological Sciences will be skilled at carrying out activities in various fields of application, such as production and technological activities in laboratories (in hospitals, private laboratories dealing with bioanalysis, private industries and more) and analysis, control and management services. The degree course in Biological Environmental Sciences aims to train professionals equipped with an in-depth knowledge in biology who are also able to tackle environmental problems, recognize, classify and define solutions, in informed and competent consultation with nature specialists, analytical technicians, businesses, public institutes and public opinion. DEB is divided into a number of laboratories which boast cutting-edge equipment, with professor-researchers who have earned international and national recognition and who publish in the best international scientific journals. The laboratories, where Bachelor's, Master's, and Phd theses are carried out are: Comparative Anatomy and Developmental Biology, Biochemistry, Bio-climatology, Molecular Biology, Botany and Mycobacteriology, Organic and natural substance Chemistry, Cytology, Dietetics and Functional food, Ecology, Ecology of Fungi and Algae, Genetics, Bio-physics, Hydrobiology, Hydro-geology, Immunology, Mathematics, Microbiology, biologic Oceanology and Zoology. You will be helped plan your studies in our department and you will be able to interact with our structures dedicated do didactics, such as the group of professors managing the Degree courses, the professors working on orientation and mentoring and the administrative staff that looks after organisation and logistics. I hope to see lots of you join our classes with your curiosity and passion for life sciences.



DEB

COURSES

ACADEMIC YEAR 2019/2020



DEGREE COURSE (L-13)

BIOLOGICAL SCIENCES



Course Director

Professor Sara Rinalducci
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Academic Office

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Educational goals

The training needs that have been identified will equip a graduate in Biological Sciences with a solid cultural basis, which can be employed in various fields. Therefore, the degree course in Biological Sciences aims to train young graduates who have adequate basic preparation in various sectors of Biology. The study pathway has been designed to provide the student with essential, integrated and progressive acquisition of skills aimed at understanding biological phenomena at levels of increasing complexity. The specific objectives of the course, while keeping in mind the competences required for future professional activities at the end of the three-year course, are oriented primarily towards the acquisition of further university education.

The academic programme includes three different study areas:

- non-biological disciplines;
- biological disciplines;
- in-depth study of biological disciplines.

The above-mentioned areas contribute sequentially and jointly to achieving the teaching aims which are specific to the course, targeted at giving the student a modern and thorough grounding in life sciences.

Career opportunities

Our graduates will be able to carry out professional activities and techniques in various fields of application, such as production and technology activities in laboratories, and services regarding analysis, control and management; and in all those public and private areas where it is necessary to classify, manage and use living organisms and their constituents. They will also be able to handle the relationship between development and quality of the environment in multidisciplinary professional firms engaged in the fields of environmental impact assessment, in the development of projects for the conservation and restoration of the environment and of biodiversity and biosafety.

In particular, according to the ISTAT classification of professions, DEB graduates qualify for employment in the following categories:

- biochemical and chemical lab technicians
- industrial, food and biotechnology lab technicians
- biomedical lab technicians

The role of the Biologist is professionally recognized. Graduates are expected to enrol in the National Association of Biologists (Junior Biologist), after having passed a State examination.

DEGREE COURSES - ACADEMIC YEAR 2019/20

In academic year 2018/2019 will be active only the first year

Exam	Professor	SSD	Year	Sem.	Hours	W/O/E	CFUs
Mathematics	(channel A-L) Mugnai (channel M-Z) Mugnai	MAT/04	I	I	56	W/O/E	6+1*
Cytology	(channel A-L) Romano (channel M-Z) Ceci	BIO/06	I	I	72	O/E	9
General and inorganic chemistry	(channel A-L) contract (channel M-Z) contract	CHIM/03	I	I	56	W/O/E	5+2*
Physics	(channel A-L) Cannistraro (channel M-Z) Bizzarri	FIS/07	I	II	56	W/O	5+2*
English language	(channel A-L) contract (channel M-Z) contract	INF/01	I	II	32	W/O/E	4+2*
Botany	(channel A-L) Zucconi (channel M-Z) Selbmann	BIO/03	I	II	72	O/E	7+2*
Zoology	(channel A-L) Fausto (channel M-Z) Scapigliati	BIO/05	I	II	72	O/E	8+1*

segue

Exam	Professor	SSD	Year	Sem.	Hours	W/O/E	CFUs
Physics and statistics workshop	Bizzarri	FIS/07	II	I	48	W/O	3+3*
Genetics	Prantera	BIO/18	II	I	72	W/O/E	8+1*
Organic chemistry	Saladino	CHIM/06	II	I	56	W/O/E	6+1*
Biologic chemistry	Caruso	BIO/10	II	II	72	O/E	8+1*
Morphogenesis and comparative anatomy	Romano	BIO/06	II	II	72	O	8+1*
English language	contract	L-LIN/12	II	II	48	W/O	4+2*
Training activities chosen by the student			II	II	48		6
Molecular biology	Rinalducci	BIO/11	III	I	72	O	9
Immunology	Velotti	MED/04	III	I	48	W/O	6
Microbiology	Fenice	BIO/19	III	I	72	O	8+1*
Training activities chosen by the student			III	I	48		6
Internship			III	I	150		6
Biochemical methodology	Bertini	BIO/10	III	II	48	O	5+1*
Physiology	Carere	BIO/09	III	II	72	O/E	9
Ecology	Nascetti Canestrelli	BIO/07	III	II	40 32	O/E	2+3* 4
Food science	Merendino	MED/49	III	II	48	O	6
Final test			III	II	250		10

AFS (Free exams offered)

Genetic methodologies workshop	Meschini	BIO/18	II	II	48	W	5+1*
Hydrobiology	Cerfolli	BIO/07	II	II	48	O	6
Hereditary human syndromes	Proietti De Santis	BIO/18	III	I	48	O	6
Biodiversity conservation	Cimmaruta	BIO/07	III	II	48	O	6

Sem Semester **W/O/E** Written/Oral/Exemption during the course

CFUs The CFUs marked with an asterisk (*) indicate practical training/workshop credits and they correspond to 8 hours of frontal lessons

DEGREE COURSE (L-32)

BIOLOGICAL ENVIRONMENTAL SCIENCES

Degrees in Biological Sciences
(ex DM 270/04)



Course Director

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Location

Civitavecchia Campus
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Educational goals

The three-year degree course includes 20 exams. Graduates will acquire in-depth fundamental knowledge of biology disciplines at a cellular, molecular, functional and eco-evolutionary level. Graduates will also acquire operational and practical abilities in the different areas of biology through the study of multi-disciplinary methods of enquiry.

The course objectives are to form professionals able to tackle, recognize, classify and develop solutions to environmental problems, while carrying out informed and competent consultation with nature specialists, analytical technicians, businesses, public institutes and public opinion. At the end of your study pathway, as a university graduate in Environmental Sciences, you will have acquired the ability to carry out an interdisciplinary approach to the study of environmental issues, thus becoming a specialist with a definite working method rather than a specialist in a single disciplinary area. You will be able to dialogue with professionals from different backgrounds and put contributions resulting from more specific and sectoral areas into a perspective view.

The course aims to provide you with the following knowledge:

- appropriate and adequate elements of mathematics, physics, chemistry, statistics, information technology and English language;
- suitable operational elements relative to animal and plant biology, genetics, ecology, microbiology, earth science, soil science, environmental law and policy and environmental economics;
- methods of analysis achieved through laboratory activities in various sectors for at least 20 Credits (CFU);
- professional experience gained through training activities, such as external internships in companies, in public administration and laboratories, and internships at Italian and foreign universities within the framework of international agreements

and the following skills:

- detection, classification, analysis, restoration and conservation of biotic and abiotic components of natural eco-systems, including water and land

(parks, natural reserves etc.);

- analysis, monitoring and simulation of systems and environmental processes controlled by scientists, focusing on sustainability and prevention, which aims towards the promotion of environmental quality;
- localization, diagnostics, protection and recovery of environmental assets.
- The course consists of several exercises at sea, thanks also to the small fleet available to the department for teaching and research activities that are also held at:
 - the Laboratory of Experimental Oceanology and Marine Ecology at the Port of Civitavecchia;
 - the Laboratory of Ecology and Experimental Ichthyogenic Centre at Saline di Tarquinia (salt flats).

Career opportunities

The main employment opportunities are to do with professional activities and techniques in the state sector (research bodies and Ministries working in the environmental sector, agricultural, forestry and fishing resources, local town hall, provincial and regional authorities and such organisations as 'autorità di bacino', park authorities, ARPA, ISPRA and so on, as well as private organisations and freelance work. In addition, our graduates typically possess requirements which are needed by professionals operating in private institutes, industries and companies in the environmental field (water treatment, control of drinking water, waste disposal management, etc.). As a graduate in Environmental Sciences, you could also consider employment in activities regarding advisory services for small business in many sectors, which include safety at work, EU safety legislation, quality control, industrial hygiene, waste disposal, and the assessment of environmental impact.

The course prepares students for the profession of:

- Environmental Control Technician
- Specialized guide
- Environmental restoration technician
- Coastal Management Technician

DEGREE COURSES - ACADEMIC YEAR 2019/20

In academic year 2018/2019 will be active only the first year

Exam	Professor	SSD	Year	Sem.	Hours	W/O/E	CFUs
Mathematics and statistical analysis	contract	MAT/05	I	I	72	W/O/E	6+3*
Cellular biology	Armentano	FIS/07	I	I	56	W/O/E	5+2*
General and inorganic chemistry	Branca - transfer credit	AGR/01	I	I	48	0	6
Animal biology	Belfiore	BIO/05	I	I	56	0	7
English language	Piscopo	GEO/04	I	II	48	0	5+1*
Plant biology	contract	CHIM/03	I	II	56	W/O/E	5+2*
Physics + labwork	Onofri	BIO/02	I	II	56	O/E	5+2*
Organic chemistry	contract	L-LIN/12	I	II	40	W/O	5
Computer science ability		INF/01	I	II	32	O/E	4
Physics complements and workshop	Delfino	FIS/07	II	I	56	W/O/E	4+3*
Environmental law and policy	contract	IUS/09	II	I	48	0	6
Fundamentals of genetics	Mosesso	BIO/18	II	I	48	0	5+1*
Climatology and oceanography	contract	GEO/12	II	I	72	0	7+2*
Training and orientation workshops			II		125		5
General and population ecology	Nascetti (mod.1)	BIO/07	II	II	40	0	2+3*
	Canestrelli (mod.2)	BIO/07	II	II	40	0	4+1*
Organic chemistry	Saladino	CHIM/06	II	II	56	W/O/E	6+1*
Microbiology	Barghini	BIO/19	II	II	48	O/E	6
Ecology of the ecosystems	Arduino	BIO/07	II	II	48	0	6
Environmental monitoring workshop	Cerfolli	BIO/07	III	I	48	0	4+2*
	Willems	BIO/06	III	I	48		4+2*
Applied ecology	Angeletti	BIO/07	III	I	48	0	4+2*
Training activities chosen by the student			III	I	96		12
Marine ecology and biologic oceanography	Marcelli	BIO/07	III	II	72	0	7+2*
Applied geology	Piscopo	GEO/05	III	II	80	0	8+2*
Internship in companies			III	II	125		5
Final test			III	II			6
Training activities chosen by the student (proposed by the CdS)							
Environmental monitoring workshop		BIO/05 - CHIM/12	III	I	96	0	3+3* 3+3*

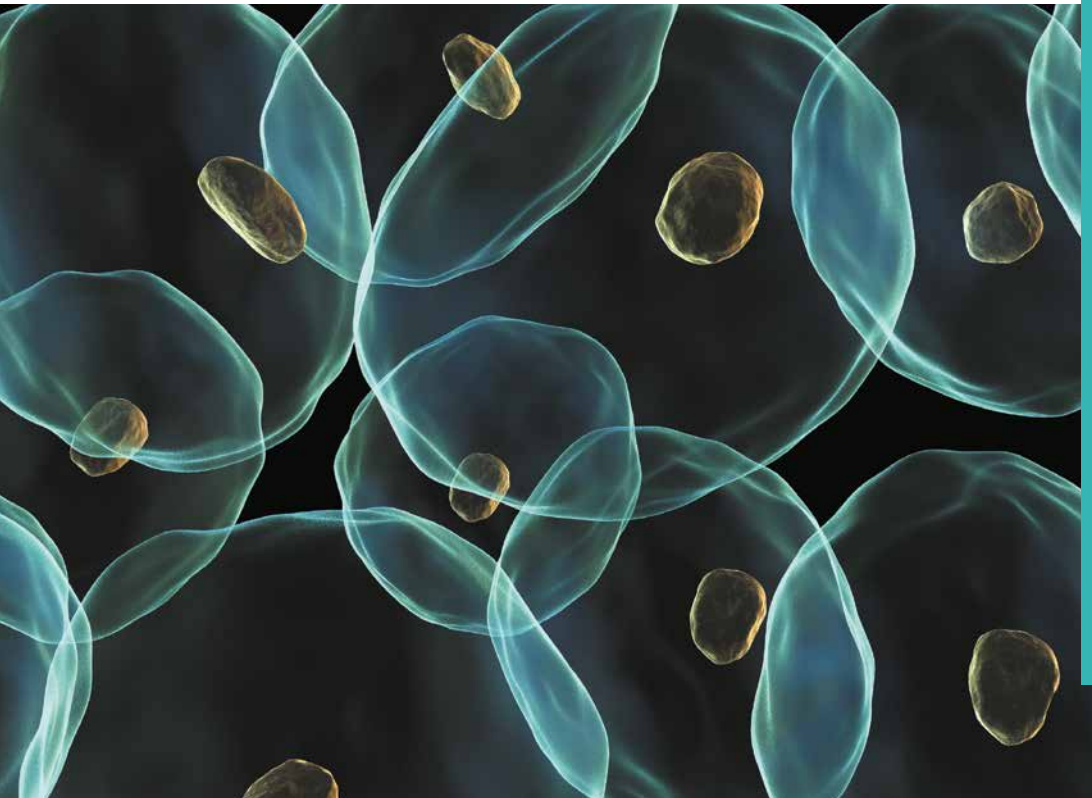
Sem Semester **W/O/E** Written/Oral/Exemption during the course

CFUs The CFUs marked with an asterisk (*) indicate practical training/workshop credits and they correspond to 8 hours of frontal lessons

SECOND-LEVEL DEGREE COURSE (LM-6)

CELLULAR AND MOLECULAR BIOLOGY

Degrees in Biology (ex DM 270/04)



Course Director

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Academic Office

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Educational goals

The main objective of the Master's of Science Degree in Cellular and Molecular Biology, LM-6, is to deepen cultural knowledge and skills in the field of basic and applied biology, coupled with thorough scientific and operational training in the disciplines that characterize the course. This objective is in line with improvements to the university system, in relation to a European and international context, thus improving the quality of training. The second level degree course aims at providing graduates a solid practical grounding in all the disciplines related to biology. The second level degree course offers in-depth studies and an expansion of the competences and knowledge acquired during the first level degree course. These will allow students to acquire the knowledge and competences they need to become the apt professionals the job market requires.

All the scientific laboratories used for the training activities provide the necessary skills, as the research carried out is coherent with the course profile. Moreover, training include laboratory activities such as exercises, experimental work for the final dissertation that are aimed at teaching students the experimental methodology and its application in research and diagnostics. The degree course also includes internships in other universities, research centres, private or state-run research laboratories, and businesses.

The degree course is aimed at building specific competences and abilities needed to carry out several different high-level jobs. Benchmarking as well as the direct experience of graduates who passed the selection process for the Master's Degree and Phd fellowship show that the course is at the same level as those offered by other Italian and European universities. The degree course has nine compulsory exams that aim at giving graduates in-depth competences in the sector of cellular biology and development, molecular biology, genetics, biochemistry, food science and English. Specific insights are provided by four exams which can be included in each student's individual study plan. Students can choose some exams they are interested in and study specific aspects of cellular and molecular biology in order to

specialise even further. Some exams examine more specific cellular and molecular mechanisms with a focus on the different experimental systems and to man. Some others offer further knowledge about the latest biological technologies, with a focus on diagnostic methodologies using advanced tools and bio-nanotechnological aspects.

Career opportunities

A Master's Degree in Cellular and Molecular Biology can offer you a wide range of employment opportunities, for example:

- basic and applied research activities in biology, biomedicine, molecular biology, nutritional science, physiology, genetics in public or private research institutes and in universities;
- access to various PhDs and specialization schools;
- self-employed and entrepreneurial activities in the life sciences sector as biologists and similar;
- professional activities and projects in areas related to biological disciplines, in institutes and in different sectors, public health and the public administration;
- managerial activities for clinical, biological, microbiological and testing laboratories, the biological and quality control of products of biological origin and the subsequent supply chains
- scientific and technological promotion and innovation activities in various areas of biology, technology planning and management.

In particular, according to the ISTAT classification of professions, Biology graduates can be employed in the following category: Biologists and related professions. The role of the Biologist is professionally recognized. In fact, a master's graduate is qualified to enrol in the National Order of Biologists (Senior Biologist) subsequent to a State examination.

DEGREE COURSES - ACADEMIC YEAR 2019/20

In academic year 2018/2019 will be active only the first year

Esame	Docente	SSD	C/O	Anno	Sem.	Ore	S/O/E	CFU
Proteomic and metabolic	Timperio	BIO/11	C	IC	I	48	0	4+2*
Cytogenetics	Meschini	BIO/18	C	I	I	48	0	5+1*
Cellular biochemistry	Caruso	BIO/10	C	I	I	48	0	5+1*
# Bionformatics and applications	Proietti	BIO/10	C	I	I	48	0	6
Cellular and developmental biology	Romano	BIO/06	C	I	II	48	0	6
Genetic engineering	Gualandi	BIO/18	C	I	II	48	0	6
Dietetics and Functional food	Merendino	MED/49	C	I	II	48	0	6
Molecular biology 2	Rinalducci	BIO/11	C	I	II	48	0	6
Internship						50		2
English language	Docente a contratto	L-LIN/12	C	II	I	48	W/O	6
Biomolecular techniques	Bertini	BIO/10	O	II	I	48	0	4+2*
Enzymology	contract	BIO/10	O	II	I	48	0	5+1*
Instrumental diagnostics, biophysics and nanosciences	Cannistraro	FIS/07	O	II	I	48	0	3+3*
Genetics of getting old	Proietti De Santis	BIO/18	O	II	I	48	0	5+1*
Genetics of development and epigenetics	Prantera	BIO/18	O	II	II	48	0	6
Chemistry of bioactive substances	Internal professor	CHIM/06	O	II	II	48	0	6
General mycobacteriology and phyto-genesis	Selbmann	BIO/03	O	II	II	48	0	3+3*
Supplementary exams (AFS)				II		96		12
Final test				II				40

C/O Compulsory/Optional **Sem** Semester **W/O/E** Written/Oral/Exemption during the course

CFUs The CFUs marked with an asterisk (*) indicate practical training/workshop credits and they correspond to 8 hours of frontal lessons

Part of the course will be held in English

The study course includes 9 compulsory exams (54 CFUs), 2 exams chosen among those available (12 CFUs), exams chosen by the student (12 CFUs), Internships (2 CFUs) and experimental thesis (40 CFUs).

**INTERDEPARTMENTAL MASTER'S
DEGREE (LM-8)**

INDUSTRIAL
BIOTECHNOLOGY
FOR HEALTH
AND WELLBEING



Administrator

Professor Fernando Porcelli
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Student Office

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Location

DEB - Block B
Largo dell'Università snc

Educational goals

The second level degree course stems from the synergy of the DIBAF and DEB departments and from the need to complete the course offer in the biotechnology area and, in particular, in industrial biotechnology. The course aims at giving students a sound scientific basis allowing them to plan, produce and recover animal, plants, microbial and synthetic bioactive molecules for the cosmetic, cosmeceutical, nutraceutical and pharmaceutical sectors. Students learn the advanced scientific methods needed to study and develop extraction and characterisation processes of natural substances, the planning of new specific bioactive molecules, the identification of their pharmacogenetic and toxicological effect and the creation of biomolecular, bio-catalytic and microbiological systems which are of fundamental importance in order to use biotechnologies in applied research, industrial production and services related to human health and wellbeing.

The course has two study areas:

- Biotechnological processes and products;
- Structural and functional characterisation of bioactive molecules.

The course includes 8 compulsory courses, 3 courses to be chosen among the 7 available ones (similar and supplementary sectors) and 12 CFUs from training activities chosen by the student (AFS, attività formative a scelta) who can therefore choose specific areas of individual interest. Moreover, there is a B2 English course and practical laboratory activities.

Skills and knowledge

Second cycle degree graduates in Industrial biotechnology for health and wellbeing acquire the following competences:

- theoretical-practical competences in the molecular and genetic sectors;
- competences in omics sciences;
- theoretical-practical competences in the sector of microbial and fermentation biotechnologies;
- theoretical-practical competences related to techniques and instruments to carry out the structural and functional analysis of macromolecules

- and biologic molecules;
- Chemistry, biochemistry and molecular competences in order to obtain materials of biotechnological interest;
 - general biotechnology competences aimed at the scientific and technological development and innovation;
 - general sustainability and bio-economy competences.

Career opportunities

This strongly job-oriented course with a theoretical-practical approach allows graduates to quickly enter the job market.

The course prepares students to work in highly-specialised intellectual scientific jobs such as biologist and similar (biochemist, biotechnologist, microbiologist, researcher and biological sciences technicians).

Therefore, graduates in Industrial biotechnology for health and wellbeing can work in:

- State-run and private research institutes and universities;
- Research and development laboratories, production and quality control departments within biotechnology companies and other companies interested in biotechnological innovation;
- Biotechnological companies in the biomedical, cosmetic, nutraceutical, pharmaceutical and environmental sectors;
- Laboratories, testing centres and imaging centres;
- Organisations dealing with the organisation of patent legislation of bioindustry processes and products;
- Jobs related to national state exams in the healthcare industry, based on the requisites stated in article 2 of decree of equivalence with the second level degree course in Biology (LM-6) (D.I. 15/01/2013, published in the Gazzetta Ufficiale of 22 June 2013, n. 145);
- Self-employed professional (national register for biologists, following a successful state exams for the job of senior biologist, section A - DPR n. 328/01);
- Scientific knowledge and specialised printing sector.

INDUSTRIAL BIOTECHNOLOGY FOR HEALTH AND WELLBEING

EXAM	SSD	Year	Sem.	Hour	A.T.	A.P.	W/A	CFUs
Microbic biotechnologies	BIO/19	I	I	48	40	8	W	6
Spectroscopic and computational methods for the study of biomolecules							A	9
- Spectroscopic methods	CHIM/02	I	I	48	40	8		6
- Computational methods	CHIM/07		I	24	16	8		3
Biochemical characterisation of pharmacologically active molecules	BIO/10	I	I	48	40	8	W	6
Biostatistics and experimental data analysis	SECS-S/02	I	I	48	32	16	W	6
Industrial catalysis and biocatalysis							A	6
- Principles of catalysis	CHIM03	I	I	24	24			3
- Industrial biocatalysis	AGR/13		I	24	20	4		3
Applied omics sciences	BIO/11	I	II	48	32	16	W	6
Chemistry of bioactive substances	CHIM/06	I	II	48	48		W	6
Genetic toxicology	BIO/18	I	II	48	40	8	W	6
English language (B2)		I	II	32	24	8	W	4
Training								3
Exam chosen among similar and supplementary exams								6
Exam chosen among similar and supplementary exams								6
Exam chosen among similar and supplementary exams								6
Exams chosen by the student (AFS)								12
Final test (dissertation)								32

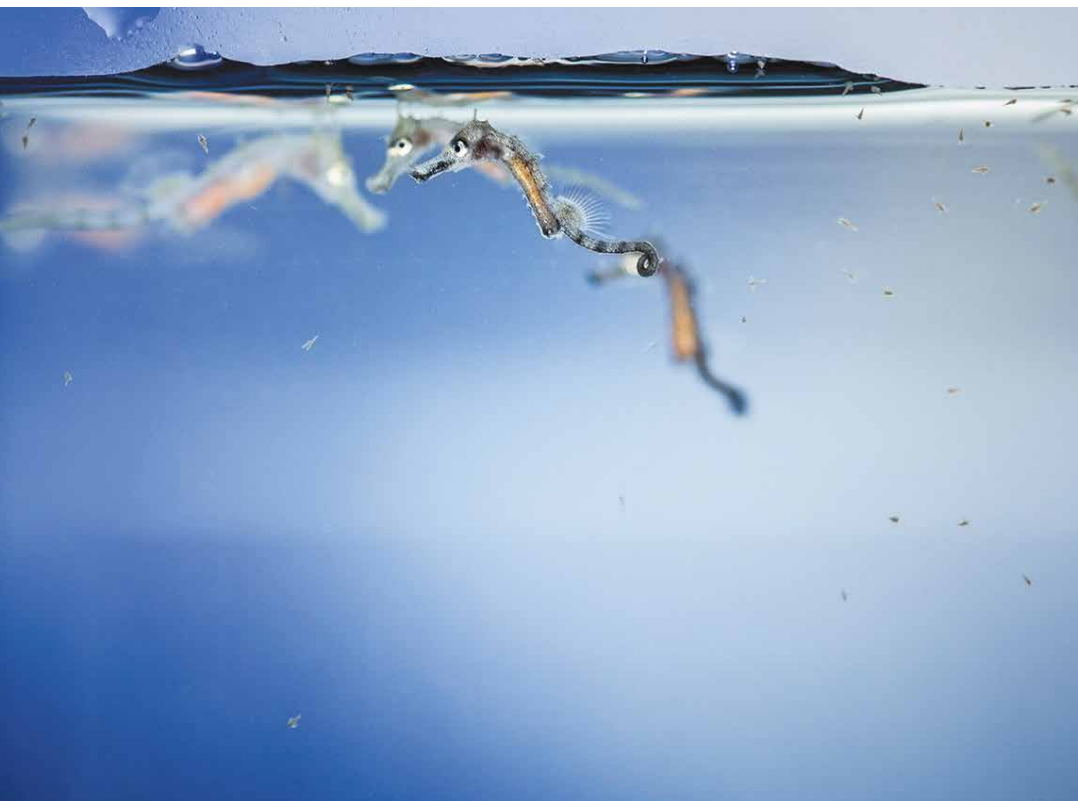
SIMILAR AND INTEGRATED EXAMS

Sustainable biorefineries and biotechnologies	BIO/19	II	I	48	40	8	W	6
Functional food	MED/42	II	I	48	40	8	W	6
Pharmacogenetics	BIO/18	II	I	48	40	8	W	6
Animal molecules biotechnologies	BIO/05	II	II	48	40	8	W	6
Plant molecules biotechnologies	BIO/01	II	II	48	40	8	W	6
Industrial applications of microscopic techniques	BIO/05	II	II	48	24	24	W	6
Applied neurophysiology	BIO/09	II	II	48		48	W	6

SECOND-LEVEL DEGREE COURSE (LM-6)

BIOLOGY AND MARINE ECOLOGY

(ex DM 270/04)



Course Director

Prof. Massimiliano Fenice
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Location

Civitavecchia Campus
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Educational goals

The educational objectives of the course aim to form a highly qualified and specialized professional figure capable of dealing with environmental problems from a biological point of view but at the same time able to manage all ecological processes at the basis of the production of goods and services that the marine environment provides. The study course aims at training marine environmental biologists. Marine environmental biologists are skilled at knowing, classifying and solving environmental issues through a systemic and interdisciplinary approach. This is achieved by prioritising competences in the management and conservation of the marine (coastal and ocean) environment biological resources. The course is aimed at the acquisition of:

- in depth knowledge of biological and ecological disciplines, both basic and applied to marine environment;
- applied management disciplines that are useful to adequately put into context biologic resources in environmental systems;
- methods of analysis through lab activities in different disciplines and in the sustainable management of fishing resources;
- professional experiences through external training and the writing of an experimental dissertation.

Students will acquire the following competences:

- detection, classification, analysis, restoration and conservation of biotic components of marine ecosystems, with the ability to place them correctly in a general environmental framework;
- monitoring and management of environmental systems and processes with specific reference to biological resources;
- design and management of evaluation, rehabilitation, restoration and conservation operations of the coastal and marine environment with particular reference to biotic components.
- The course consists of several exercises at sea, thanks also to the small fleet available to the department for teaching and research activities that are also held at:
 - the Laboratory of Experimental Oceanology and

- Marine Ecology at the Port of Civitavecchia;
- the Laboratory of Ecology and the Experimental Ichthyogenic Center at the Saline di Tarquinia (Tarquinia salt flats).

Career opportunities

Employment prospects for master's graduates in Marine Biology and Ecology could orient towards freelance work in professional and managerial tasks within a public framework (ministries, regions, provinces, municipalities, health care, national and regional agencies for environmental protection, parks, reserves, etc.) and within a private framework (companies, institutes, etc.) in the following areas:

- analysis, certification and management of the environment according to regulations controlling the quality of sea water;
- the analysis, conservation, management and monitoring of marine and coastal resources and environment systems aiming at maintaining biodiversity in all its components and functional levels;
- professional and project-related work in fields related to biological and ecological disciplines in the sectors of public administration, industry and health care, with particular reference to the knowledge of marine and coastal environments and relative animal and plant organisms, micro-organisms, biodiversity and environment;
- management of parks and nature reserves;
- the evaluation of the quality of the environment and the production of services and tools aimed at its improvement;
- the evaluation and put into practice of environmental impact and strategic evaluation studies;
- analysis and control of pollution;
- planning and monitoring of environmental control actions;
- planning, promotion and coordination of initiatives aimed at sustainability.

Other employment opportunities regard the sector of scientific research at universities and other public and private research institutions. The doctoral programme

gives what is known as a third level of training, which is crucial to undertake a career in the field of research. The course prepares graduates for the following jobs:

- ecologists and marine biologists;
- researchers and graduates in oceanology and biological sciences;
- zoologists and botanists;
- managers of coastal areas.

DEGREE COURSES - ACADEMIC YEAR 2019/20

In academic year 2019/20 only the first year will be active

Exam	Professor	SSD	Year	Sem.	Hours	W/O/E	CFUs
Ecology of fishing and experimental aquaculture	contract (mod.1)	BIO/07	I	I	40		3+2*
	contract (mod.2)	BIO/07	I	I	40	0	4+1*
Marine biology	contract	BIO/07	I	I	40	0	5+1*
2 to be chosen amongst:							
a) Marine parasitology	contract	VET/06	I	I	48	0	5+1*
b) Marine environment protection	Angeletti	BIO/07	I	I	48	0	5+1*
c) Marine biological monitoring	contract	BIO/07	I	I	48	0	4+2*
d) Plant biology and coastal ecosystems	Onofri	BIO/03	I	II	48	O/E	5+1*
Biology of algae and marine mushrooms	Pasqualetti	BIO/02	I	II	56	0	6+1*
Marine microbiology and laboratory	Fenice	BIO/19	I	II	48		5+1*
	Barghini	CHIM/11	I	II	48	0	5+1*
Ecology, etology and evolution of marine organisms	Canestrelli	BIO/07	I	II	48		4+2*
	Carere	BIO/05	I	II	40	0	4+1*
Applied oceanography and dynamics of marine ecosystems	Marcelli	BIO/07	II	I	72	0	7+2*
Marine biodiversity conservation	Cimmaruta	BIO/07	II	I	56	0	6+1*
Training activities chosen by the student			II	I	96		12
Training			III	II	100		4
Experimental thesis			III	II			30

Sem Semester

W/O/E Written/Oral/Exemption during the course

CFUs The CFUs marked with an asterisk (*) indicate practical training/workshop credits and they correspond to 8 hours of frontal lessons

POSTGRADUATE STUDIES

PHD RESEARCH AND MASTER'S DEGREE

Coordinator

Professor Roberta Cimmaruta
Tel. 0761 357759
cimmaruta@unitus.it

PhD in Ecology and sustainable management of Environmental resources

The Doctorate in Ecology and Sustainable Management of Environmental Resources aims to train young professionals in the sector of ecological research, both basic, and applied to the sustainable use of natural resources and to environmental management. Students will acquire the skills needed to address the complex and multi-dimensional problems related to research activities, management and conservation in questions regarding the environment with interdisciplinary and multi-sectoral research approaches.

Interdepartmental Master's

Degree - DIBAF - DEIM - DAFNE
DISUCOM - DEB

Administrative Offices

DIBAF

Coordinator

Diana De Santis

Contact details

desdiana@unitus.it
Tel. 0761 357371

First Level Master's Degree in Enogastronomy - Management, Enhancement and Promotion

The aim of the master's degree course is:

- to prepare highly specialised professionals, with multidisciplinary skills, able to know, understand, evaluate and interpret with expertise the quality of enogastronomic products and activities, and to promote an efficient strategy of enhancement. Today, highly skilled professionals in this field are difficult to find in the current marketplace.
- The course aims to enable you to acquire the technical communicative tools with a view to creating an awareness of the quality of foods, which is essential to successfully evaluate, enhance and/or manage a product.

The master's course will suit you, therefore, if you are interested in working or if you already operate within the agro-food, restaurant or services industries. It could also interest you if you want to follow a freelance career within these environments or if you want to take up a professional activity in the field of communication and in journalism specialising in tourism or enogastronomy. The master's course is organized in three macro areas, divided into various modules, for a total of 60 CFU:

■ *Macro area 1*

Communication and advertising:

for a total of 7 CFUs

■ *Macro area 2*

Business, management and quality:

for a total of 7 CFUs

■ *Macro area 3*

Agro-food:

for a total of 10 CFUs

■ **Practical activities and workshops:**

for a total of 10 CFUs

■ **Visits to businesses, planning and analysis of case studies, communication and marketing:**

for a total of 16 CFUs

The programme offers students the possibility to study single modules, which could be useful if you want to improve specific business skills. This could interest you for professional or cultural reasons, or if you do not have the necessary entry qualifications for the course (three-year degree or equivalent), or if you do not wish to attend the entire course. Furthermore, it could give you the opportunity to strengthen technical or marketing skills or to better manage your own business.

It is possible to enrol on single or multiple modular courses, without having to complete the whole master's study programme.

You can enrol on the master's degree course if you have a three-year degree in any subject in the field of humanities or science.

You will be granted the postgraduate degree of Master in Enogastronomy - Management, Enhancement and Promotion if you attend the lessons, pass the module exams and the final exam.

DIDACTIC OFFER RESEARCH

The Department of Biological and Ecological Sciences boasts a group of professors whose background and scientific interests are deeply rooted in the areas of environmental and biological sciences, doing international research with evident competitive characteristics. Since the Department's foundation, the wide range of disciplinary and technical skills of the members of the Department has resulted in fruitful interdisciplinary collaboration. The research objectives of the Department fall into two main and closely linked areas.

- Research in environmental and ecological fields. This is the study and characterization of marine and coastal environments, inland water and terrestrial environments, including extreme environments from a physical-chemical as well as biological perspective. The specific lines of research range from geology to green chemistry, to theoretical and applied ecology, with the study, monitoring and management of environmental resources.
- Research in the field of Biological Sciences. This deals with the analysis of the genetic and molecular mechanisms of fundamental biological processes, such as: evolution, adaptation and biodiversity, the origins of life, cell differentiation, nano-biotechnology, epigenetic inheritance, immunity, biochemistry of nutrients, mechanisms of carcinogenesis and neurodegenerative diseases, mutagenesis and toxicology, plant defense mechanisms, omics sciences (proteomics, metabolomics and lipidomics), extraction, synthesis and biological characterization of natural substances.

DEPARTMENT HANDBOOK

USEFUL INFORMATION

On the DEB website www.deb.unitus.it you can find information regarding:

INFORMATION:

- Courses for the academic year 2018/19
- Calendar, lesson timetable and online forms
- Student services, internships, apprenticeships, choice of activities
- Orientation and mentoring
- Individual study plan ⁽¹⁾
- Support courses ⁽²⁾

1. In order to take exams starting from the early session in January / February 2019, students must validate their individual study plan through the online student portal in the periods set by the Department (01-12-2018/10-01-2019; 01-04-2019/30-04-2019; 01-06-2019/15-06-2019).
2. As of September/October 2018, support courses in Mathematics, Chemistry, Biology and Physics will take place. The Mathematics and Chemistry courses are required for freshmen who have not passed the entry test (recupero debito formativo-OFA). These support courses are aimed at raising the initial preparation of students to a required standard.

ORIENTATION

There is an online orientation, support and tutoring service for students:

- ✉ tutordeb.vt@unitus.it (Viterbo campus)
- ✉ tutordeb.civ@unitus.it (Civitavecchia campus)

STUDENT SERVICES

In addition to normal office hours for students (every day, from Monday to Friday, from 10:00 to 12:00am), from the 1st of May until the 31st of December and excluding the month of August an **afternoon support service** is available every Tuesday from 2:30pm to 4:00pm at the Department Academic Office. This is an initiative of the administrative staff in the hope of meeting the needs of students, which are not only of a strictly educational nature. Students will be able to ask the administrative staff about some general information such as public transport services, housing, services provided by the University (legal defence, psychological services) and more.

Department of Biological and Ecological Sciences Off-campus Laboratories



The **Centro Ittiogenico Sperimentale Marino** (CISMAR) (The Experimental Ichthyogenic Centre) was founded in 2008 and has its headquarters at the Animal Repopulation Reserve, “Le Saline di Tarquinia.” The Centre consists of 4 laboratories dedicated to Molecular Genetics, Monitoring of Marine and Coastal Environments, Monitoring of Benthos, Parasitology and Fish Pathology, and a Hatchery.

CISMAR was created with the aim of activating re-stocking projects of commercial and non commercial species of the coastal strip, for the benefit of professional, sports and recreation fishing activities, in addition to work aimed at the recovery of marine biodiversity also within protected marine areas. The creation of the Centre also pursues an objective of social and cultural nature aimed at fostering an awareness of the management of the coastline and proposes innovative strategies for management of “fishing” resources. Furthermore, CISMAR aims at being a reference point for both authorities and private parties in the sector for testing of breeding techniques for fish not already included among those currently farmed, and for the refinement of techniques already used.



The **Laboratory of Experimental Oceanology and Marine Ecology** was founded in 2001 and since 2005, it has its headquarters within the Port of Civitavecchia; the structure consists of 200 square meters of offices and laboratories (electronics, ecology, oceanographic instrumentation and an optical laboratory) and a library boasting around 1000 reference titles, and 180 square meters of warehouse for oceanographic equipment. The equipment includes scientific research instruments worth about 3 million euros, including a steel boat measuring 8.5 meters and two dinghies.



You can learn more about the courses offered by the Department on:

 **Unitus DEB Viterbo**

 **Unitus DEB Civitavecchia**

OFFICES AND STUDENT SERVICES

Academic Office

Viterbo Campus

didat.deb@unitus.it

Senior Administrator

Maria Concetta Valeri

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Coordinators

Irene Mantovani

tel. 0761 357117

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Marco Urbani

tel. 0761 357113

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Civitavecchia Campus

Coordinators

Giovanni Moretti

Tel. 0766 28931 – gmoretti@unitus.it

Caterina Ripa

Tel. 0766 28931 - cripa@unitus.it

Computer labs

Largo dell'Università snc

Opening Hours 9:00am / 4:00pm

Administrator

Giuseppe De Santis

Tel. 0761 357085

gdesantis@unitus.it

Libraries

The university library system

Scientific area

Via S. Camillo De Lellis

Opening Hours Mon-Thu 9.00 / 19:00

Fri 9.00 / 17.00

Coordinator

Laura Tavoloni

Tel. 0761 357513

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Job Placement

Administrator

Professor Raffaele Saladino

Tel. 0761 357284

saladino@unitus.it

Erasmus

Administrator

Professor Claudio Carere

claudiocarere@unitus.it

ACADEMIC CALENDAR

1st semester lessons begin	30th September 2019
Lessons suspended for exams	from 18th to 22nd November 2019
1st semester lessons end	17th January 2020
Beginning of Christmas holidays	23rd December 2019
End of Christmas holidays	6th January, 2020
1st semester exams begin	20th January 2020
1st semester exams end	28th February 2020
2nd semester lessons begin	2nd March 2020
Lessons suspended for exams	from 20th to 24th April 2020
2nd semesters lessons end	12th June 2020
Beginning of Easter holidays	10th April 2020
End of Easter holidays	14th April 2020
Summer session exams begin	20th April 2020
Summer session exams end	24th April 2020
Autumn session exams begin	5th September, 2020
Autumn session exams end	30th September, 2020
Beginning of 2nd session exams, autumn session	18th November, 2020
End of 2nd session exams, autumn session	22nd November, 2020
Additional session exams start	
final session academic year 2016/2017	20th January, 2021
Additional session exams end	
final session academic year 2016/2017	28th February, 2021
Graduation Sessions	22nd - 23rd - 24th July, 2020 21st - 22nd - 23rd October, 2020 16th - 17th - 18th December, 2020 22nd - 23rd - 24th February, 2021

DEPARTMENT STRUCTURE

Director

Professor Giorgio Prantera

Deputy Director

Professor Daniele Canestrelli

Student Office

Giuseppe Rapiti

Academic Office

Maria Concetta Valeri

Professors Full professors

Anna Rita Bizzarri, Daniele Canestrelli, Salvatore Cannistraro, Dimitri Mugnai, Giuseppe Nascetti, Silvano Onofri, Giorgio Prantera, Raffaele Saladino, Francesca Velotti

Professors Associate professors

Carlo Belfiore, Carla Caruso, Roberta Cimmaruta, Ines Delfino, Massimiliano Fenice, Giampiero Gualandi, Marco Marcelli, Nicolò Merendino, Pasquale Mosesso, Vincenzo Piscopo, Luca Proietti De Santis, Sara Rinalducci, Nicla Romano, Laura Selbmann, Anna Maria Timperio, Laura Zucconi

Research fellows

Paola Arduino, Paolo Barghini, Laura Bertini, Roberta Meschini, Marcella Pasqualetti, Daniela Willems

Temporary Research Fellows

Dario Angeletti, Ilaria Armentano, Claudio Carere, Marcello Ceci, Fulvio Cerfolli, Silvia Proietti

Student representatives

Marco Boschi, Alessia Catalani, Raffaele Montuoro, Michele Nicola T. Strizzi

Representative of doctoral students and Research fellows

Lara Costantini

Technical Representative

Francesca Tilesi

Administrative Representative

Marco Urbani

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Marcello Ceci	Research fellow	m.ceci@unitus.it	
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Technical and administrative staff

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Caterina Ripa	education laboratories technician	cripa@unitus.it	0766 21600
Angelo Schinoppi	Lab technician	schinoppi@unitus.it	0761 357257
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Francesca Tilesi	Lab technician	francesca.tilesi@unitus.it	0761 357754

 **Note**

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