



UNIVERSITY OF L'AQUILA



Department of Health, Life and Environmental
Sciences

Profile of

1st Cycle Degree in

BIOLOGICAL SCIENCES

Laurea in

SCIENZE BIOLOGICHE

DEGREE PROFILE OF Laurea in SCIENZE BIOLOGICHE 1st Cycle Degree in Biological Sciences		
TYPE OF DEGREE & LENGTH	Single degree (180 ECTS credits, 3 years).	
INSTITUTION(S)	Università degli Studi dell'Aquila (Italy) – University of L'Aquila	
ACCREDITATION ORGANISATION(S)	Ministry of Education (Italy) Ordine Nazionale dei Biologi Italiani (Italian Register of Biologists) – Sec B (ONB, http://www.onb.it)	
PERIOD OF REFERENCE	Programme validated for 3 years for cohorts starting in January 2013.	
CYCLE /LEVEL	QF for EHEA: 1st cycle; EQF level: 6; Italian NQF: Laurea	
A	PURPOSE	
	The Bachelor Degree in Biological Sciences provides the students with the opportunity to acquire a basic knowledge on the different fields of Biology, starting from the key disciplines (Mathematics, Physics, Chemistry), key tools for acquiring methodologies and techniques to investigate biological systems. The programme meets the requirements of European and National laws and Directives. Degree holders obtain the credentials for National Certification as Junior Biologists.	
B	CHARACTERISTICS	
1	DISCIPLINE(S) / SUBJECT AREA(S)	Biology, Biomolecular, Basic, Biomedical (60:36:34:21)
2	GENERAL / SPECIALIST FOCUS	General focus on the life sciences, broad spectrum on necessary basic knowledge of mathematics, chemistry and physics.
3	ORIENTATION	It is an academic degree with a theoretical orientation providing skills for application of theory to several professional fields (Histologist, Botanic, Zoologist, Lab analysis) according to International and National Directives.
4	DISTINCTIVE FEATURES	The course provides the opportunity to carry out the studies in a quiet environment It is also a very large number Possibility of external internships at companies both public and private. This degree has a strong component of interdisciplinary learning with other Health Care professionals and is developed in a stimulating research environment with daily contacts with teachers and PhD students. Students have a 3/6-months placement in Labs in Italy and/or abroad.
C	EMPLOYABILITY & FURTHER EDUCATION	
1	EMPLOYABILITY	The graduates, after the successful national test, can be enrolled in the Register of Professional Junior Biologists (Section B) and carry out professional activities in the traditional roles of executive and technical analysts in the laboratories of the agriculture-food industry, environmental, research and the drug industry, but also in roles innovative (economics, marketing, etc.).
2	FURTHER STUDIES	The Bachelor Degree in Biological Sciences normally gives direct access to the corresponding Second Cycle degree programme. It also gives access to some other Second Cycle degree programmes in Health care and environment professionals with further specialization.
D	EDUCATION STYLE	
1	LEARNING & TEACHING APPROACHES	Lessons, lectures, laboratory classes, practice experience under professor supervision, short stage; individual study on test books and lecture notes, individual consultations with academic staff, preparing diploma dissertation.
2	ASSESSMENT METHODS	Written and oral exams, laboratory reports. Final comprehensive exam, assessment of Diploma dissertation.
E	PROGRAMME COMPETENCES	
1	GENERIC	
		The degree programme meets the competences and quality assurance procedures required by <i>Italian Register of Biologists</i> and by the National Higher Education Quality Assurance Agency (AVA) for degree courses at first level. This includes the Generic Competences expected for the first cycle graduated, as follows: - Capacity to learn and stay up-to-date with learning about biological fields.

	<ul style="list-style-type: none"> - Knowledge and understanding of the subject in relation to the profession of biologist Junior. - Knowledge and understanding of safety rules. - Knowledge and understanding of the main microscopic techniques and the main instruments present in biological laboratories. - Commitment to health, well-being and safety. - Ability to work in team both in the laboratory and in the preparation of a written report. - Ability to communicate effectively and to present complex information in a concise manner orally e writing and using appropriate technical language. - Ability to communicate key information from one's discipline or field to non-experts. - Ability to solve problems and write scientific reports.
2	SUBJECT SPECIFIC
	<p>The Programme meets all the Specific Competences as established and agreed in collaboration with the field stakeholders, clustered within the key overarching competences summarized below:</p> <p>Knowledge of</p> <ul style="list-style-type: none"> -fundamentals in mathematics, physics and chemistry with particular reference to the fundamental principles of inorganic and organic chemistry. -issues related to micro-organisms and plant and animal organisms, considering all possible aspects: morphological, cellular, functional, biochemical, molecular, relating to reproduction and to inheritance, environmental and evolutionary. -the techniques of analysis of biodiversity, biochemical, biomolecular, microbiological, cytological methods, the principles of biomedical and toxicological analyzes; <p>Comprehension/understanding:</p> <ul style="list-style-type: none"> -ability to describe key concepts of physical sciences: physics, chemistry, biological sciences and environmental sciences; -ability to read and interpret descriptive statistical output and to collect, interpret and process scientific data within the limits of their knowledge; <p>Application</p> <ul style="list-style-type: none"> -ability to discuss the characteristics of specific subunits and how those characteristics influence biological structures, to predict how changes will alter structure and function; -capacity to solve, describe and simplify algebraic expressions and equations; -ability to apply the knowledge gained in the field of biology, identifying the most appropriate methodologies to problem solving, working both independently and in groups; <p>Analysis</p> <ul style="list-style-type: none"> -ability to compare and contrast molecular structure of DNA, RNA and proteins. Integrate the mechanisms of gene expression and genomic signaling processing to various techniques and tools; -ability to compose a working hypothesis, distinguish between independent and dependent variables and analyse basic biological concepts within problems; <p>Synthesis</p> <ul style="list-style-type: none"> -capacity to conduct experiments using appropriate methodology and analyze data to test working hypotheses; -ability to collect data following proper laboratory protocols and analyze results. -ability to explain basic laboratory safety rules and precautions and to describe the proper use of basic biology equipment and protocols, and data presentation; <p>Creativity</p> <ul style="list-style-type: none"> -capacity to Identify an example of the impact of technology, a controversial issue and an historical figure in the biological sciences; - ability to produce written material using appropriate technical style; - ability to create and deliver effective oral presentations and explain commonly used technical and scientific terms. <p>Evaluation</p> <ul style="list-style-type: none"> - ability to read technical and scientific articles and compare the different results.; - capacity to recognize the importance of the interaction between science, technology and society; -ability to apply scientific reasoning as a primary form of problem solving; <p>Problem managing</p> <ul style="list-style-type: none"> - capacity to manage troubleshoot and to perform quality checks of equipment; <p>Communication</p> <ul style="list-style-type: none"> - ability to properly cite scientific sources; apply the proper use of punctuation and grammar in oral, written and visual presentations; -ability to communicate effectively to experts and normal public their knowledge and results, both in first and second language by using technical and scientific terms.
F	COMPLETE LIST OF PROGRAMME LEARNING OUTCOMES
	<p>A newly graduated Bachelor of Biological Sciences should be able to:</p> <ul style="list-style-type: none"> - independently combine specific skills with understanding of the different areas of biology practice; - independently source, critically assess and apply new research in work contexts and participate in development work,

implementation and evaluation within the biologist profession;

- critically assess his/her own professional practice and biology practice in general;
- adapt to new situations and be innovative when solving problems and making decisions, whether individually or in collaboration with team partners;
- assume responsibilities in his work;
- further develop his/her own knowledge, skills and competences as part of life-long learning, including identifying his/ her own learning requirements and assessing the learning outcome;
- be innovative in applying in his/her practice knowledge of evolution mechanisms (natural selection, mutation, gene flow and genetic drift) and evidence for evolution (antibiotic resistance, fossil record, extinction) ;
- discuss gene regulation (development, cell signaling, metabolism, aging, etc.), explain network of interactions within biological system using mathematical models and computer software;
- acquire good working habits showing skills in maintaining a safe laboratory environment and understanding of standard operation procedures;
- demonstrate proficiency in using English language, including subject area terminology, for literature search and good working habits concerning working alone (diploma thesis) and in teams (laboratory reports, congress reports), achieving results within a specific time-frame.

Comprehensive Scheme of the First Cycle Degree in BIOLOGICAL SCIENCES

YEAR	CODE	COURSE	Credits (ECTS)	Semester	
I	F0036	General and Inorganic Chemistry	6	1	
	F0066	Cellular Biology	6	1	
	F0166	Mathematics	9	1	
	F0102	Botany	9	2	
	F0104	Zoology	9	2	
	F1155	Organic Chemistry	9	2	
	F0168	Physics	6	2	
	F1151	<i>English Language Level A2</i>	3	1 and 2	
II	F0044	Developmental Biology	6	1	
	F0093	Biochemistry	9	1	
	F0113	Genetics	9	1	
	F1189	Histology	6	1	
	F1149	Elements of Informatics	4	1	
	F0048	Laboratory of Microscopic Techniques	2	2	
	F0071	Comparative Anatomy and Anthropology	9	2	
	F0108	Microbiology	6	2	
	F1150	<i>Free choice Courses</i>	6	1 and 2	
III	F0082	Ecology	9	1	
	F0211	Principles of General Pathology and Immunology	6	1	
	F0122	Laboratory of Cell and Molecular Techniques	2	1	
	F0059	General Physiology	9	1	
	F0119	Molecular Biology	9	2	
	F0172	Applied Cellular and Molecular Methods	2	2	
	F0125	Plant Physiology	9	2	
	F0171	General Pharmacology and Toxicology	6	2	
		F1150	<i>Free choice Courses</i>	6	1 and 2
		F0097	<i>Internship</i>	3	1 and 2
	F0103	<i>Thesis</i>	5	2	