



UNIVERSITÀ
DEGLI STUDI
DEL MOLISE

DIVISIONE RISORSE E SERVIZI
AREA SERVIZI AGLI STUDENTI
COORDINAMENTO SEGRETERIE STUDENTI
SETTORE DOTTORATI DI RICERCA

PhD in Biologia e scienze Applicate – BEAT
PhD in Biology and applied sciences

Coordinator	Prof. Ing. Giovanni Fabbrocino e-mail: giovanni.fabbrocino@unimol.it	
Overview	<p>The PhD Program in 'Biology and Applied Sciences' of the University of Molise aims at training advanced scientific and technological skills able to carry out autonomous and interdisciplinary research in the field of biology and safety of infrastructure and information, developing and integrating advanced tools for analysis and processing of data. Particular attention is paid to the education of the student to develop strategies of analysis and solution of complex problems to be applied both in research and in industrial contexts.</p> <p>The course is divided into two curricula:</p> <ul style="list-style-type: none"> - Biology: aims at training highly qualified professionals with an interdisciplinary preparation able of designing and autonomously carrying out basic and applied research in the context of the various biological systems. The research topics concern microbial, animal and plant organisms and include their study at cellular, molecular and morpho-functional level. - Applied Sciences: aims at training professionals able to autonomously design and carry out research in scientific fields characterized by high levels of interdisciplinarity by using quantitative methods. The latter are established in the field of information sciences, structural and environmental monitoring technologies by exploiting the integration of numerical analysis techniques, optimization methods, data and knowledge management, software engineering and IT security. <p>Additional information on the PhD Program are available at the Dept. BT website http://dipbioter.unimol.it/dottoratobeat/</p>	
Web site	http://dipbioter.unimol.it/dottoratobeat/	
Duration	01/11/2020 – 31/10/2023	
Available positions	Positions with scholarships	5
	Positions without scholarships	2
	Positions with scholarships for applicants with foreign degree	1
	Positions with scholarship reserved for applicants from foreign universities	2
	TOTAL	10
	OF WHICH WITH SCHOLARSHIP	8
Requirements for admission to the competition	Degree taken after a Graduate Program (Two-year higher course) already declared equipollent by competent Italian authorities or deemed equivalent for the sole purposes of the competition to a Second Level Italian specialist/master degree equivalent to those released in Italy in the following classes:	



LMG/01 Law
 LM2 Archaeology
 LM-4 Architecture and Architectural engineering
 LM-6 Biology
 LM-7 Agrarian Biotechnologies
 LM-8 Industrial Biotechnologies
 LM-9 Pharmaceutical, Veterinary and Medical biotechnologies.
 LM-10 Conservation of environmental and architectural heritage
 LM-11 Conservation and restoration of the cultural heritage
 LM-13 Pharmacy and industrial pharmacy
 LM-17 Physics
 LM-18 Computer science
 LM-21 Biomedical engineering
 LM-22 Chemical engineering
 LM-23 Civil engineering
 LM-24 Construction engineering
 LM-26 Safety engineering
 LM-31 Management engineering
 LM-32 Computer systems engineering
 LM-33 Mechanical engineering
 LM-35 Environmental engineering
 LM-40 Mathematics
 LM-41 Medicine
 LM-42 Veterinary Medicine
 LM-43 Information technology methods for the humanities
 LM-44 Mathematical modelling for engineering
 LM-53 Material engineering
 LM-54 Chemistry
 LM-60 Natural sciences
 LM-61 Nutrition
 LM-66 Computer systems safety
 LM-69 Agriculture
 LM-71 Industrial chemistry
 LM-82 Statistics
 LM-91 Methods and techniques for the information society
 2/S Archaeology
 4/S (Architecture and construction engineering)
 6/S (Biology)
 7/S (Agricultural biotechnologies)
 8/S (Industrial biotechnologies)
 9/S (Pharmaceutical, veterinary and medical biotechnologies)
 10/S (Conservation of architectural heritage and environment)
 11/S (Conservation of scientific assets and industrial civilization)
 12/S (Conservation and restoration of cultural heritage)
 20/S (Physics)
 22/S (Law)
 23/S (Computer Science)
 24/S (Computer Science for humanities)
 27/S (Chemical engineering)
 28/S (Civil engineering)
 35/S (Computer engineering)
 36/S (Mechanical engineering)
 38/S (Environmental engineering)
 61/S (Materials science and engineering)



	62/S (Chemistry) 77/S (Agriculture sciences and technologies) 81/S (Industrial chemistry and related technologies) 82/S (Environmental and land sciences and technology) Special rules may prevent the application of foreign students to the grant issued by INPS .
Assessable Qualifications	The maximum of 20/80 points can be assigned to the candidate depending on the following academic qualifications: <ul style="list-style-type: none"> - Final degree mark; as an alternative in the case of missing degree at the time of the application, average grade of the passed exams; - Master degree thesis; - Scientific publications on peer-reviewed journals (max. 3 items); - participation to national and international congresses with written contributions, oral presentations and posters (max 5 items); - Documented research activity at National and International Universities and research centers; - Awards; - International study experiences in the Erasmus program; - International study periods, stages and traineeship at National and International level; - Work experience, stage and traineeship at industrial companies; - Post-graduate master programs; - Post-graduate study and research grants; - Post-graduate research grants.
Thematic areas of the research project proposals and of the interview	Research proposal Candidates are required to prepare a research project proposal to be submitted along with the application form. The maximum length of the research project is 10.000 characters (excluding spaces and references). The project proposal must be on one of the following themes selected among those of interest to the two curricula: <ol style="list-style-type: none"> 1. <u>Biology</u> (2 positions with scholarship; 1 position without scholarship): <ol style="list-style-type: none"> a. <i>recovery, conservation, monitoring and characterization of biodiversity;</i> b. <i>study of the mechanisms of interaction between plant organisms and the environment;</i> c. <i>use of plants and microorganisms in environmental recovery and restoration;</i> d. <i>analysis of microbial communities and study of the interaction between microorganisms and between microorganisms and higher organisms;</i> e. <i>study of the cellular mechanisms that underlie certain human pathologies;</i> f. <i>analysis of the response of healthy or pathological human cell models to treatment with molecules of natural and / or synthetic origin;</i> g. <i>regulation of metabolic pathways in cell proliferation, survival and differentiation processes.</i> 2. <u>Applied Sciences</u> (3 positions with scholarship; 1 position with scholarship on topic h.; 1 position with scholarship on topic i.; 1 position without scholarship): <ol style="list-style-type: none"> a. <i>design and development of complex and secure software systems;</i> b. <i>design of decision support systems based on machine learning techniques and both exact and meta-heuristic optimization methods;</i> c. <i>analysis and design of mathematical models for image analysis and for modeling and numerical solution of complex equation systems;</i>



	<p>d. <i>advanced diagnostics and monitoring of people, environment, built heritage and cultural heritage;</i></p> <p>e. <i>security of IT and technological infrastructures, both from a software and physical point of view (buildings, networks, lifelines);</i></p> <p>f. <i>analysis, refurbishment and preservation of the relevant environmental, urban, historical and architectural heritage;</i></p> <p>g. <i>Structural and geotechnical safety of structures subjected to natural and anthropic hazards and emerging technologies for risk mitigation.</i></p> <p>h. <i>safety of road bridges and non-structural components of structures, infrastructures and cultural heritage (PhD scholarship funded by ITC-CNR).</i></p> <p>i. <i>Sustainable development by means of technological innovation in the manufacturing sector, with reference to the textile supply chain (PhD scholarship funded by INPS).</i></p> <p>The research proposal may contain graphic elements and be divided into paragraphs containing a summary, the state of the art, the objectives, the methodology, the techniques and the related technological resources, a temporal framework of the different research phases, the expected objectives and their impact in the reference scientific area.</p> <p>The positions reserved to students graduated in a foreign University are associated to the curriculum once the evaluation and ranking of the candidates is accomplished.</p> <p>Interview</p> <p>The oral exam and interview will consist of the oral presentation of the research proposal and a discussion of the technical and scientific issues related to it. Knowledge of the English language will also be evaluated. Candidates can carry out the presentation and discussion in English.</p>
Assessment criteria and ranking of the candidates	<p>The assessment of academic qualifications is preparatory to the interview.</p> <p>The ranking of the candidates after the first stage of assessment will be published, as soon as available and in any case within September 15th 2020, on the website of the University of Molise at the following address: https://www.unimol.it/https-www-unimol-it-ricerca/dottorati-di-ricerca-2/avvisi/</p> <p>The maximum score is equal to 80/80, divided into the following sub-scores:</p> <ul style="list-style-type: none"> • 20/80 Academic qualifications; • 20/80 Research proposal in written form; • 40/80 Interview and knowledge of English language. <p>Two separate rankings will be drawn up for the access to curricula and a third for the allocation of the scholarship reserved to graduates in foreign universities.</p> <p>The assignment of positions on special research topics (ITC-CNR & INPS) in the context of the Applied Sciences curriculum is based on the score of those candidates who applied for the special research topic positions.</p> <p>The final ranking of the candidates will be published, as soon as available on the PhD program web page https://www.unimol.it/https-www-unimol-it-ricerca/dottorati-di-ricerca-2/avvisi/</p>
Interview calendar	<p>Date: September 16th, 2020 at 10:00 a.m. Rome Time; the agenda of the interviews will be defined by the Selection Committee depending on the number of candidates.</p> <p>Place: Dipartimento di Bioscienze e Territorio, Università degli studi del Molise, Contrada Fonte Lappone, Pesche (IS).</p>

