ANNEX.1A

UNIVERSITA' DEGLI STUDI DEL MOLISE

Area Innovazione e Sviluppo

Dottorato in BIOSCIENZE E TERRITORIO (DOT1339138)

PhD IN BIOSCIENCES AND TERRITORY

Coordinator: prof. Gabriella Stefania SCIPPA

Length of course	1st November 2018 – 31st October 2021
Educational targets	The PhD Course in Biosciences and Territory aims to develop advanced scientific and technological abilities required to carry out highly qualified autonomous research activities, even with an interdisciplinary approach, to apply to the fields of environmental biology, territory planning, management and monitoring, computer science and mathematics.
	Curricula:
	1. Environmental Biology: aims to develop highly qualified researchers with multidisciplinary skills, able to plan and carry out autonomously basic and applied research concerning the physical, chemical and biological interactions of the various biotic and abiotic environmental components.
	2. Computer science-Mathematics: aims to provide wide- ranging and in depth know-how on computer science and mathematics, with particular emphasis to a)software engineering, software system security and computer law, computer forensics, biometric systems, images processing, and b) optimization, decision theory, numerical analysis.
	3. Territory : intends to prepare researchers qualified to use innovative integrated approaches to deal with different issues related to environmental safeguard and conservation, social and economical development, risk evaluation, and planning of system defenses against natural and anthropogenic hazards.
	All the information about the PhD program activities and rules are available at the following web pages: <u>http://dipbioter.unimol.it/</u> and https://www.unimol.it/ricerca/dottorati-di-ricerca- 2/regolamenti/

	- A University degree obtained after 2-year specialization
	courses
Admission	- A University degree (old university legislation)
requirements	- Foreign academic qualification already declared equipollent by
	competent Italian authorities or deemed equivalent for the sole
	purposes of the competition.
Total available	Total available positions 10:
positions	- 8 positions with scholarship, 1 of which reserved to students graduated at the foreign Universities and 1 cofinanced by CNR
	- 2 positions without scholarship
	Curriculum Territory
	2 positions with scholarships, 1 cofinanced by CNR
	Curriculum Environmental Biology
	1 positions with scholarships
	Curriculum Computer science-Mathematics
	3 position with scholarship
	2 positions without scholarship
	1 position with the scholarship is reserved to students graduated in a
	foreign University and it will be assigned to the curriculum after the
	selection based on the results.
	Italian candidates
Exams - Modalities of	 Evaluation of qualifications and project proposal annexed to the
admission	application
	 Interview in Italian or English language
	 Language: compulsory knowledge of English language
	Italian candidates residing abroad
	 Evaluation of qualifications and project proposal annexed to the
	application
	 Possible interview in videoconference.
	A Skype contact is compulsory

	Foreign candidates
	• Evaluation of qualifications and project proposal annexed to the
	application
	 Interview in English language
	 Language: compulsory knowledge of English language
	Foreign candidates residing abroad
	 Evaluation of qualifications and research project proposal annexed
	to the application
	Possible interview in videoconference.
	A Skype contact is compulsory
Interview	Place: Università degli Studi del Molise, Dipartimento di Bioscienze e
	Territorio, Pesche (IS)
	Date : starting from 16 th October 2018 at 10.00 according to the
	agenda established by the commission based on the number of the
Other assessable	admitted to the interview. Qualifications evaluated up to 20/80 points:
aualifications	- Final degree mark: in the case students did not graduated yet the
quanneations	average of the marks obtained to each exam will be considered
	- Scientific publications on peer-reviewed journals (may 3)
	scientific publications in congress proceedings (max. 3),
	participation to national and international congresses with oral
	presentations and posters;
	- Other qualifications considered evaluable (study grants, awards,
	courses attended, Masters, Erasmus or study programs abroad, work experiences related to the PhD themes, etc.)
Criteria for evaluating	Evaluation of qualifications is preparatory in order to be admitted to the
the exams	tests. All candidates having scored at least 15/80 and 15/80 for the
	for the interview. The scores will be published, as soon as available,
	and before the interview, on the web site of the Dipartimento di
	bioscienze e Territorio <u>nup://dipbioter.unimol.it/</u>
	Scored at most 20/80 for the titles
	scored at most 60/80 for the project presentation:

	20/80 for the research project proposal annexed to the application
	form
	40/80 for the oral presentation and discussion of the research
	project proposal annexed to the application form
Examination themes	Application forms should be accompanied with a research project proposal completed with date and signature. The proposal will be discussed during the interview. It is compulsory to send the research project with the application. The research project must have a maximum length of 10.000 characters (excluding references) and it can include drawings, figures and graphs. The project proposal must be on one of the following themes:
	1.Curriculum - Territory:
	 A) BIM systems development for design, construction and management of civil engineering structures.
	B) Integrated technologies for relief, classification and seismic
	analysis of artistic assets in museums and historical
	constructions.
	C) Performance-based analysis of structural and non-structural
	components of civil and industrial structures
	D) Integrated structural monitoring technologies for the proactive
	protection and maintenance of strategic structures and
	infrastructures
	Scholarship cofinanced by CNR:
	A) Analysis and modeling of particulate matter deposition on
	urban (arboreal o forest) vegetation
	2.Curriculum – Environmental Biology:
	A) Characterization and conservation of autochthon germpalsm of
	spontaneous and cultivated plant species
	B) Use of plants for environmental "green technologies C) Chemical and physical analysis of plant secondary metabolites
	and their relationships with the environment
	and then relationships with the environment

D)	Analysis and characterization of microbial communities in
	various habitats, in interdisciplinary scientific contexts
E)	Environmental impact on the cellular processes involved in
	cancer pathogenesis
F)	Analysis of the signal transduction pathways activated by
	environmental factors in mammalian cells
G)	Ethnobotany: officinal plants and secondary metabolites
3.Cur	riculum - Computer science-Mathematics:
A)	Decision support systems based on machine learning and big
	data analysis.
B)	Optimization algorithms for logistic problems defined on
	graphs.
C)	Procedural thinking, computational thinking, coding.
D)	Numerical methods for mathematical models applied to
	information technology, medicine, biology, cultural heritage
	and sport.
E)	A mathematics education based on the most common
	applications used in digital devices.
F)	New methodologies for security and privacy of mobile
G)	Historical development of the approximation methods for
	differential and/or integral equations.
H)	Use and development of Mathematical-Informatics methods
,	and models or implementation of hardware for the simulation,
	analysis and data taking in the areas of experimental
	Leptonic Physics or fundamental Physics in the space.
Schola	arship reserved to students graduated in foreign Universities
A)	Use of remote sensing data and modelling approach supporting
	ecosystem-based territorial planning
B)	"Omic" based approaches to investigate plant response to
	different environmental conditions

C) Advanced or innovative methods for the analysis, design,
maintenace and manufacturing of engineering constructions.
D) 'Monitoring biodiversity at different geographic scales'
For the oral presentation and discussion of the project candidates could use information technology supports
use information technology supports.