

PHD PROGRAM IN “ENGINEERING FOR ENERGY AND ENVIRONMENT”			
Department	Dipartimento di Economia e Impresa (DEIM) In collaboration with Dipartimento di Scienze Agrarie e Forestali (DAFNE)		
Partner Institutions	None		
Program duration	3 years: 1st November 2020 – 31st October 2023 Thesis Defence: within April 2024		
Program objectives	<p>The PhD program in Engineering for Energy and Environment aims to provide a high level of training to a select number of young graduates to make them competitive on a national and international level in private companies with high technological contents, research centers and universities. The main objective of the program (which is structured in two curricula, Energy and engineering systems and Biosystems and environment) is to provide an interdisciplinary view of engineering problems in the energy and environment scientific areas, characterized by a high technological development. The research activities will be devoted to the study of new engineering solutions, novel processing techniques and innovative research methodologies, with a focus on their technology transfer. Students will be engaged in training activities and scientific research in the program subjects, with particular reference to technologies for thermonuclear fusion, energy conversion processes, energy storage, environmental issues, innovations in the fields of mechanical engineering, also in agriculture, and of sensors, biosystems and agricultural issues, with regard to primary production and environmental aspects. The work of the PhD students will be coordinated by the members of the board already active in national and international industrial collaborations and research projects, in innovative and relevant topics, such as hydrogen technologies, renewable energy, biomass, biosystems and thermonuclear fusion.</p>		
No. of positions	Total places	18	
	Places with scholarships	11	
	Industrial Ph.D.	2	(2 CRS Laghi)
	Reserved for Research Center Employees (CREA-IT)	1	
	Places without scholarships	4	
Curricula (In the application form the candidate must specify the curriculum of interest)	Curriculum “Energy and engineering systems” n.6 places with scholarship, n. 2 places without scholarship		
	Curriculum “Biosystems and environment” n. 5 places with scholarship (one of which reserved for graduates in foreign universities), n. 2 industrial doctoral positions, 1 reserved (CREA-IT) and n. 2 places without scholarship		
	<p>Curriculum “Energy and engineering systems”</p> <ul style="list-style-type: none"> - n. 1 scholarship co-financed by DEIM (prof. Rossi) and University of Tuscia <i>Topic: Design and construction of an exoskeleton for simulated dynamics</i> - n. 1 scholarship funded by the University of Tuscia 		

<p>Places without scholarship</p>	<p><i>Topic: Study, design and testing of vacuum systems for tokamak devices for nuclear fusion</i></p> <ul style="list-style-type: none"> - n.1 scholarship funded by CINTEST (prof. Calabrò, Topic: Study of design and implementation of innovative products based on waste re-use through a circular economy approach - n. 3 scholarships funded by ENEA funds <p><i>Topics:</i></p> <ol style="list-style-type: none"> 1) <i>Studies to evaluate the role of neutrals in highly dissipative regimes in "tokamak" machines for fusion using spectroscopy methods;</i> 2) <i>Study of the distribution of the thermal flow incident on the divertor in tokamak-type plasmas through the use of infrared cameras,</i> 3) <i>Thermo-structural analysis for the DTT fusion machine</i> <p>Curriculum "Biosystems and environment"</p> <ul style="list-style-type: none"> - n. 1 scholarship co-financed by DAFNE (SAFEMed project) and by the University of Tuscia <p><i>Topic: Experimental analysis and numerical simulation of processes and technologies for the energy conversion of residual biomass.</i></p> <ul style="list-style-type: none"> - n. 1 scholarship co-financed by CIRDER and the University of Tuscia <p><i>Topic: Multi-physical numerical simulation and testing of technologies for the exploitation of solar energy</i></p> <ul style="list-style-type: none"> - n. 1 scholarship funded by the PMB srl company <p><i>Topic: Precision farming mechanization. and tractor-machinery interaction</i></p> <ul style="list-style-type: none"> - n. 1 scholarship funded by the University of Tuscia <p><i>Topic: Agri-voltaic solutions for greenfield sites and for "green areas" of brownfield sites</i></p> <ul style="list-style-type: none"> - n. 1 scholarship reserved for graduates in USA and funded by the Cooperation_agreement_UNITUS_NYU <p><i>Topic: environmental engineering applications in basic research and process monitoring techniques</i></p> <ul style="list-style-type: none"> - n. 2 industrial PhD scholarships reserved for the CRSLaghi (Research and Study Center of the Lakes): <p><i>Topics:</i></p> <ol style="list-style-type: none"> 1. <i>Intellectual property rights of biosystems and environmental technology;</i> 2. <i>Development of technological innovation models within the Patent Box framework.</i> <ul style="list-style-type: none"> - n. 1 place reserved for employees of research institutions (CREA-IT) <p><i>Topic: harvest of lignocellulosic and oil crops in an arid environment</i></p>
<p>Places without scholarships</p>	<p>Curriculum "Energy and engineering systems"</p> <ul style="list-style-type: none"> - n. 2 places <i>Topics:</i> - <i>Engineering analysis of the DTT thermal shield</i> - <i>Laboratory for the development of engineering methodologies for the multispectral imaging applied to cultural heritage</i> <p>Curriculum "Biosystems and environment"</p> <ul style="list-style-type: none"> - n.2 places <i>Topics:</i> - <i>innovative safety systems based on the use of smart and wearable sensors for monitoring and managing dangerous conditions in the agricultural and forestry sector;</i>

	- <i>innovative systems in the logistic management of smart energies..</i>										
Admission requirements	<p>Application to the public competition is open to all, regardless of age and citizenship, who, by the date this call expires, possess one of the qualifications listed below:</p> <ul style="list-style-type: none"> - an Italian “laurea specialistica” degree, obtained according to the Ministerial Decree n. 509/1999; - an Italian “laurea magistrale” degree, obtained according to the Ministerial Decree n. 270/2004; - an Italian equivalent university degree obtained under the Italian regulations previously in force, the time-span of which being no less than 5 years; - a foreign university degree equivalent to those mentioned above. <p>Admission is also open to university students who will finish their MS degree by October, 31th, 2020. In such cases admission will be “conditional”. The applicants will send by mail (capuani@unitus.it) or hand out to the “Ufficio Offerta Formativa” a self-certification of the relative degree (a certification in case of Non-EU students). Self-certification (or certification in case of Non-EU students) should state the name of the awarding University, award date, grade and type of qualification (“vecchio ordinamento”, “Specialistica”/“magistrale”) and a copy of a valid identity document. Applicants not in possess of the admission requirements must indicate the date by which they expect to obtain the qualification required.</p>										
Evaluation of candidates (Maximum score: 80 out of 80)	<p>Evaluation of academic qualification and oral examination Assessment of the English Language Knowledge. Language for the examination: Italian or English</p> <p>The evaluation of qualifications is preliminary to the oral exam. The score obtained by candidates after the evaluation of their qualifications will be added to the score of the oral examination. The results will be published on the Tuscia University web site (www.unitus.it) at the section of “Didattica”->“<i>Dottorati di Ricerca</i>”</p> <p>Together with the application form, candidates should submit a research project, within the themes of Ph.D., up to a maximum of 5 pages, which must be written in Italian or English. The research project will be discussed during the oral exam.</p>										
Evaluation of academic qualification (Maximum score: 20 out of 80)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Master’s thesis: max</td> <td style="text-align: right;">5 points</td> </tr> <tr> <td>University career (exams taken with the relative grades and final grade): max</td> <td style="text-align: right;">4 points</td> </tr> <tr> <td>Research and/or study activities in foreign institutions: max</td> <td style="text-align: right;">2 points</td> </tr> <tr> <td>Professional experiences and other qualifications that each candidate considers useful: max</td> <td style="text-align: right;">4 points</td> </tr> <tr> <td>Research project submitted by the candidate: max</td> <td style="text-align: right;">5 points</td> </tr> </table> <p>Before of the oral exam, the evaluation of academic qualification results will be published on the Tuscia web site www.unitus.it (section “<i>Didattica</i>” > “<i>Dottorati di Ricerca</i>”).</p>	Master’s thesis: max	5 points	University career (exams taken with the relative grades and final grade): max	4 points	Research and/or study activities in foreign institutions: max	2 points	Professional experiences and other qualifications that each candidate considers useful: max	4 points	Research project submitted by the candidate: max	5 points
Master’s thesis: max	5 points										
University career (exams taken with the relative grades and final grade): max	4 points										
Research and/or study activities in foreign institutions: max	2 points										
Professional experiences and other qualifications that each candidate considers useful: max	4 points										
Research project submitted by the candidate: max	5 points										
Evaluation of the oral exam (Maximum score: 60 out of 80)	<p>Oral exam: maximum score 60 out of 80 points</p> <p>The minimum score for a positive oral exam will be at least 40 out of 80 points.</p> <p>The foreign language subject to verification will be English.</p>										
	The oral test, aimed at ascertaining the candidate aptitude for scientific research, will focus on the discussion of issues related to the PhD										

Topics of the oral examination	program topics and the research project presented by the candidate. The oral exam will include a verification of the English language knowledge based on reading and translation of sections of a scientific text.
Exam dates and locations	The exams will be held between 9th –23th <i>September</i> 2020. The timetable for the exams will be published in the section "Didactics">"Doctoral Studies" of the University's website (www.unitus.it) within the deadline of the call for application
Contact to information	Contacts of the course: Prof. Danilo Monarca e-mail: monarca@unitus.it Prof. Giuseppe Calabrò e-mail: giuseppe.calabro@unitus.it