



Annex A

**PhD PROGRAM IN
ENGINEERING FOR ENERGY AND ENVIRONMENT**

Coordinator	Prof. Andrea Lugi Facci		
Department	Department of Economics, Engineering, Society and Business Organization in collaboration with the Department of Agriculture and Forest Sciences and the Department for Innovation in Biological Agrofood and Forest Systems		
Program duration	3 years: 1st November 2024 – 31st October 2027 Thesis Defence: within February 2028		
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 positions	16	
	A) Positions with PNRR DM 630/2024 scholarship	3	M4C2 Inv. 3.3
	B) Positions with scholarships funded by external bodies/Departments/University of Tuscia	10	
	C) Positions without scholarship	3	
Curricula (In the application form the candidate must specify the curriculum of interest)	Curriculum “Energy and engineering systems” n. 10 positions with scholarship		
	Curriculum “Biosystems and environment” n. 3 positions with scholarship, n.3 positions without scholarship		
A) Positions with PNRR DM 630 scholarship	<p>M4C2 – Inv. 3.3 “Innovative doctorate scholarships co-funded by companies</p> <p>Curriculum “Energy and Engineering Systems”</p> <p>a) Topic: “hydrogen for energy system optimization and management of renewable energy sources”</p>		



	<p>Cofinancing enterprise: AZZEREO CO2 S.r.l., Roma Advisor: Prof. Andrea Luigi Facci</p> <p>b) Topic: “Hydrogen for energy storage withing the green energy transition context” Cofinancing enterprise: Ricerca sul Sistema Energetico – RSE S.p.A., Milano Advisor: Prof. Stefano Ubertini</p> <p>Curriculum “Biosystems and environment”</p> <p>a) Topic: “Climate change and hazelnuts: investigating water demand and productivity” Cofinancing enterprise: “Ferrero Trading Lux S.A. Senningerberg, Luxembourg Advisor: Prof. Flavia Tauro</p>
	<p>Please note that the acceptance of a PNRR scholarship implies obligations additional to those of a regular scholarship: see art. 16 of this Call.</p>
<p>B) No. 10 scholarships co-funded by external bodies, by the Departments and by the University of Tuscia</p>	<p>- no. 10 positions with scholarships for research projects on topics related to:</p> <p>Curriculum “Energy and Engineering Systems”</p> <p>a) Topic: “Design and metrological characterization of measurement systems for biomechanics Advisor: Prof. Stefano Rossi e Dott. Juri Taborri</p> <p>b) Topic: “Artificial Intelligence for Energy Systems Optimization” Funding body: ENEA - Dipartimento Tecnologie Energetiche e Fonti Rinnovabili RM Advisor: Prof. Andrea Luigi Facci</p> <p>c) Topic: “Multiphysical models for metamaterials design” Advisor: Prof. Pierluigi Fanelli</p> <p>d) Topic: “Methodologies and tools for ecodesign for additive manufacturing” Advisor: Prof. Marco Marconi</p> <p>e) Topic: “Hydrogen storage in multi energy systems”. Advisor: Prof. Stefano Ubertini</p> <p>f) Topic: “Innovative technologies for copper and HTS tokamak power supplies.” Cofinancing body: Energy Technology S.r.l., Valsamoggia BO Advisor: Prof. Giuseppe Calabrò</p> <p>g) i. Topic: “Advanced real-time control and fast protection HW and SW architecture based on integrated microcontrollers and FPGA architecture for DTT”</p>



	<p>Cofinancing body: DTT S.c. a r.l. Consortium for the implementation of the Divertor Tokamak Test Project Advisor: Prof. Giuseppe Calabrò</p> <p>h) I. Topic: “Development of pumping and gas injection systems and pressure and compositions measurements of gases in DTT” Advisor: Prof. Giuseppe Calabrò</p> <p>Curriculum “Biosystems and environment”</p> <p>a) Topic: “Climate change and emerging risks for occupational safety and health in agriculture” Advisor: Prof. Danilo Monarca</p> <p>b) Topic: “Territorial planning and governance with particular reference to lake systems”. Advisor: Prof. Fabio Recanatesi</p>
<p>C) Positions without scholarship</p>	<p>no. 3 positions for research projects on topics related to:</p> <p>Curriculum “Biosystems and environment”</p> <p>a) a. Topic: “High performance computing for the development of models for phenomena” Advisor: Prof. Ines Delfino</p> <p>b) Topic: “Recovery and valorisation of historic rural buildings in Tuscia” Advisor: Prof. Alvaro Marucci</p> <p>c) Topic. “Mechanization assessment in the harvesting of agroforestry systems” Advisor: Prof. Rodolfo Picchio</p>
<p>Admission requirements</p>	<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, 2024. In such cases admission will be “conditional”. Failure to obtain the degree by that date will result in forfeiture of admission to the doctoral course. If the candidate is the winner, he will be admitted and enrolled "with reserve" and must submit, by 31 October 2024, via e.mail (dottorati@unitus.it), the following documentation:</p> <ul style="list-style-type: none"> - if the degree is obtained in Italy, a self-certification relating to the achievement of the degree;



	<p>- if the qualification is obtained abroad:</p> <ul style="list-style-type: none"> • if an Italian citizen: a self-certification relating to the achievement of the degree, the model of which will be available on the web page reserved for PhDs, with a copy of a valid identity document attached; • if EU citizen or non-EU citizen: a certificate or equivalent document for the achievement of the qualification, in English (eg Diploma supplement). <p>For graduating applicants, the score reserved for the graduation evaluation will be replaced by the evaluation of the average of the exams.</p> <p>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.</p> <p>Candidates who do not meet the admission requirements at the time of submitting their application must indicate the date by which they expect to obtain the required qualification.</p>
<p>Evaluation of candidates (Maximum score: 80 out of 80)</p>	<p>Evaluation of academic qualification and oral examination Assessment of the English Language Knowledge.</p> <p>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.</p> <p>The results will be published on the Tuscia University website under the label “Dottorati di Ricerca”.</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>
<p>Evaluation of academic qualification (Maximum score: 20 out of 80)</p>	<p>Master’s thesis: max 5 points</p> <p>University career (exams taken with the relative grades and final grade): max 4 points</p> <p>Research and/or study activities in foreign institutions: max 2 points</p> <p>Professional experiences and other qualifications that each candidate considers useful: max 4 points</p> <p>Research project submitted by the candidate: max 5 points</p> <p>Before of the oral exam, the evaluation of academic qualification results will be published on the Tuscia University website under the label “Dottorati di Ricerca”.</p>
<p>Evaluation of the oral exam (Maximum score: 60 out of 80)</p>	<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>
<p>Topics of the oral examination</p>	<p>The oral test, aimed at ascertaining the candidate aptitude for scientific research, will focus on the discussion of issues related to the PhD program topics and the research project presented by the candidate.</p> <p>The oral exam will include a verification of the English language knowledge based on reading and translation of sections of a scientific</p>



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Exam dates and location	The exams will be held by 12 September 2024. The timetable of the interviews will be published on the University website under the label " Dottorati di Ricerca " by the deadline of the application call.
Contact to information	Contacts of the course: Prof. Andrea Luigi Facci: andrea.facci@unitus.it Prof. Massimo Cecchini e-mail: cecchini@unitus.it Prof. Giuseppe Calabrò e-mail: giuseppe.calabro@unitus.it