PH.D. PROGRAM IN
"SCIENCE, TECHNOLOGY AND BIOTECHNOLOGY FOR SUSTAINABILITY"

Coordinator	Prof. Andrea Vannini
Department	Department for Innovation in Biological, Agrofood and Forest systems (DIBAF)
Program duration	3 years: 1st November 2024 – 31st October 2027 Thesis Defence: within April 2028
Program objectives	The main aim of this PhD course is to provide high-quality training in research methods and prepare professional researchers for Universities, Research Institutions and Industries in three fields of research: 1) Food products; 2) Forest Ecology and environmental technologies; 3) Biological systems/ Bioindustries; The research activities of the curriculum in Food products will cover the food science and technology sector and deal with food processing, preservation and quality assessment and management, as well as the assessment of the environmental impact of food processing. The teaching activity will involve the cooperation with the National Network of the Italian PhD Research in Food Science Technology and Biotechnology. The research activities of the curriculum Forest ecology and environmental technologies will include the functionality and structure of forest systems, the soil system being included; forest biodiversity; monitoring and management of forest and environmental resources; the ecological recovery of degraded ecosystems; climate and global change mitigation and adaptation. The research activities of the curriculum Biological systems/ Bioindustries will include basic and applied biology for animal, plant, and microbial systems; bioremediation and human health biotechnologies, as well as the white-, green- e red-biotechnologies. The research activities of the international curriculum Urban Green Infrastructures and Sustainable Development will include the study of the urban ecosystem and the development of green technologies to be used to reduce the environmental impact of urbanized areas. The teaching programme is directed to provide students with skills in English language, statistical analysis of experimental data, bioeconomic, and assessment of the environmental sustainability of complex systems.

No. of positions	Total positions	14	
	A) Position with "PNRR Research DM 629/2024" scholarship	1	M4C1 Inv. 4.1
	B) Position with "PNRR DM 630/2024" scholarship	3	M4C2 inv. 3.3

	C) Positions with scholarships co-funded by public bodies/Department/University	9	
	D) Position without scholarship	1	
Curricula (In the application form the candidate must specify the curriculum of interest)	Curriculum in Food products no. 2 positions with scholarship		
	Curriculum in Forest Ecology and environmental technologies no.9 positions with scholarship and no. 1 without scholarship		
	Curriculum in Biological systems/ Bioindustries no. 3, positions with scholarship		
(A) Position with "PNRR Research DM 629/2024" scholarship	**M4C2 Inv. 4.1 "PNRR Research lines"** **no. 1 scholarship to undertake research on:** **Curriculum Food products** Topic: "Production of wines through the use of technologies and processes human safe and healthy for human, with limited use of energy resources and reduced environmental impact"		
B) Positions with "PNRR DM 630/2024" scholarship	**M4C2 – Inv. 3.3 "Innovative doctorates aimed at strengthening the demand of innovation of enterprises and promoting the employment of researchers"** **no. 3 scholarships to undertake research on:** **Curriculum Biological systems/ Bioindustries** a. Topic: "Sustainable production of bio-based surfactants" Co-funding company: Ballestra S.p.A., Milano Advisor: Prof. Marcello Fidaleo **Curriculum Food products** b. Topic: ""Characterization and smart semi-drying of 'Alto Viterbese' PGI pota cultivars" Co-funding company: CO.PA.VIT. – Consorzio della Patata Alto Viterbese, Acquapendente VT Advisor: Prof. Roberto Moscetti **Curriculum Forest Ecology and environmental technologies** c. Topic: "Impact of biotic factors on the structural stability of urban trees: early diagnosis, epidemiological models and mitigation strategies Co-funding company: SmarTrees S.r.l., Viterbo Advisor: Prof. Andrea Vannini		
	Please note that the acceptance of a PNRR scholarship implies obligations additional to those of a regular scholarship: see art. 16 of this Call.		

(C) Positions with fellowship co-funded by external bodies, the Department DIBAF and the University of Tuscia	**No. 9 scholarships to undertake research on:**
	Curriculum Forest Ecology and environmental technologies
	a. Topic: "Impact assessment of agricultural policies and new supply chain business models designed to protect biodiversity and the regenerative capacity of agricultural and forestry soils"
	Advisor: Prof. Emanuele Blasi
	Curriculum Forest Ecology and environmental technologies
	b. Topic: "Remote sensing and in situ measurements of Sun-Induced Fluorescence (SIF) for the analysis of carbon assimilation processes in forest ecosystems"
	Advisor: Prof.ssa Anna Barbati
	Curriculum Forest Ecology and environmental technologies
	c. Topic: "Land suitability of the urban and peri-urban area of Rome: assessments of soil quality with respect to nutrient and water availability, and carbon sequestration"
	Advisor scientifico: Prof.ssa Sara Marinari
	Curriculum Biological systems/ Bioindustries
	d. "Bioinformatic methods for the study of viral proteins"
	Advisor: Prof. Giovanni Chillemi
	Curriculum Biological systems/ Bioindustries
	e. Topic: "Bioinformatic methods for the study of viral proteins"
	Advisor: Prof. Giovanni Chillemi
	Curriculum Forest Ecology and environmental technologies
	f. Topic: "Digital Technologies for Tree physiology and environmental stresses"
	Scholarship co-funded by Fondazione Centro Euromediterraneo sui Cambiamenti Climatici (CMCC), Lecce
	Advisor: Prof. Riccardo Valentini
	Curriculum Forest Ecology and environmental technologies
	g. Topic: "Monitoring ecosystem GHGs exchange through eddy covariance"
	Scholarship co-funded by Centro Nazionale delle Ricerche-IRET, Porano TR
	Advisor: Prof. Dario Papale
	Curriculum Forest Ecology and environmental technologies
	h. Topic: "Detection of pollutant via generation of plant sensors"
	Scholarship co-funded by Centro Nazionale delle Ricerche-IRET, Porano TR
	Advisor: Prof. Dario Papale
	Curriculum Forest Ecology and environmental technologies
	i. Topic: "Smart sensors for analysis and detection of trees structural and ecological stressors"
	Scholarship co-funded by Centro Nazionale delle Ricerche-IRET, Porano TR
	Advisor: Prof. Dario Papale

(D) Position without scholarship	**no. 1 position to undertake research on:** **Curriculum Forest Ecology and environmental technologies** Topic: "Satellite remote sensing data processing and analysis techniques (multispectral, hyperspectral, SAR) for diagnostics and monitoring in the environmental and cultural heritage fields" Advisor: Prof. Stefano De Angeli
Admission requirements	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: 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 timespan of which being no less than 4 years; a foreign university degree equivalent to those mentioned above. Admission is also open to university students who will finish their MS degree by October 31st, 2024. In this case, 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.
Evaluation of candidates (Maximum score: 80 out of 80)	**- Evaluation of academic qualification and oral examination** **- Assessment of the English Language Knowledge (for Italian candidates only)** Language for the examination: English The final score is given by summing the scores relative to the academic qualification and oral examination. These scores will be published on the Tuscia University website under the label "Dottorati di Ricerca". Together with the application form, candidates should present a research project, within the themes given below for each curriculum, up to a maximum of 8000 characters, which must be written in Italian or English. The research project will be discussed during the oral exam.
Evaluation of academic qualification (Maximum score: 20 out of 80)	Master's thesis: max 4 points University career (exams taken with the relative grades and final grade): max 6 points Scientific publications relating to the areas of Ph.D.: max 1 points Research and/or study activities in foreign institutions: max 1 points Participation in research projects: max 1 points Professional experiences and other qualifications that each candidate considers useful: max 1 points Research project submitted by the candidate: max 6 points 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".

Evaluation of the oral exam	Oral exam: maximum score 60 out of 80 points The minimum score for a positive oral exam will be at least 40 out of 80 points.
Topics of the oral examination	**Curriculum in *Food products*.** The oral exam will be aimed at assessing the candidate's basic knowledge of the agro-food science, technology, and biotechnology, and, specifically, will focus on the discussion of the research project presented by the candidate, which must be in line with one or more of the topics of the scholarships **Curriculum in *Forest Ecology and environmental technologies*** The oral exam will be aimed at assessing the candidate's basic knowledge of the forest ecology and environmental technologies with specific attention to the functionality, structure, biodiversity, monitoring and management of forest, agro-forest and environmental resources; climate and global change mitigation and adaptation, forest resilience and restoration of degraded ecosystems. It will also focus on the discussion of the research project presented by the candidate, which must be in line with one or more of the topics of the scholarships **Curriculum in *Biological systems/Bioindustries*** The oral exam will be aimed at assessing the candidate's knowledge of basic biology and industrial biotechnology related to plant, animal and microbial systems, biotecnologies for remediation and human health, white-, green- e red-biotechnologies and, specifically, will focus on the discussion of the research project presented by the candidate, which must be in line with one or more of the topics of the scholarships
Exam dates and locations	The exams will be held by September 12, 2024. The date(s) of the interview will be published on the University website on the Tuscia University website under the label "Dottorati di Ricerca" by the deadline of the application call.
Contacts to information	Responsible for the curriculum *Food Products* Prof. Riccardo Massantini e-mail massanti@unitus.it Responsible for the curriculum *Forest Ecology and Environmental Technologies* Prof. Dario Papale e-mail darpap@unitus.it Responsible for the curriculum *Biological systems/ Bioindustries* Prof. Anna Maria Fausto e-mail fausto@unitus.it