<table>
<tr><th colspan="4">Ph.D. Program in Science, Technology and Biotechnology for Sustainability</th></tr>
<tr><td>Coordinator</td><td colspan="3">Prof. Mauro Moresi</td></tr>
<tr><td>Department</td><td colspan="3">Department for Innovation in Biological, Agrofood and Forest systems (DIBAF), University of Tuscia</td></tr>
<tr><td>Partner Institution</td><td colspan="3">People's Friendship University of Russia (RUDN University)</td></tr>
<tr><td>Program duration</td><td colspan="3">3 years: 1st November 2020 – 31st October 2023
Thesis Defence: within April 2024</td></tr>
<tr><td>Program objectives</td><td colspan="3">The main aim of this PhD course is to provide high quality training in research methods and prepare professional researchers for University, Research Institutions and Industries in three fields of research:
1) Food products;
2) Forest Ecology and environmental technologies;
3) Biological systems/ Bioindustries;
4) Urban Green Infrastructures.

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, statistic analysis of experimental data, bioeconomics, and assessment of the environmental sustainability of complex systems.</td></tr>
<tr><td rowspan="5">No. of positions</td><td>Total positions</td><td>14</td><td></td></tr>
<tr><td>Positions with scholarships</td><td>12*</td><td></td></tr>
<tr><td>Positions with research grant</td><td>0</td><td></td></tr>
<tr><td>Positions without scholarships</td><td>2</td><td></td></tr>
<tr><td colspan="3">* 1 scholarship is reserved to the international curriculum Urban Green Infrastructures and Sustainable Development</td></tr>
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Curricula **(**In the application form the candidate must specify the curriculum of interest**)**	Curriculum in *Food products* no. 1 positions with scholarship
	Curriculum in *Forest Ecology and environmental technologies* no. 6 positions with scholarship no. 1 position with no scholarship
	Curriculum in *Biological systems/ Bioindustries* no. 3 positions with scholarship
	International curriculum in *Urban Green Infrastructures and Sustainable Development* n. 2 position with a scholarship provided by RUDN University (Moscow, Russia) and reserved for candidates who have been admitted to the 1st year of the *Post-graduate course direction 03.02.08 Ecology* at the same University, beginning in the 2020-21 academic year.
Scholarships	Curriculum in *Food products* n. 1 scholarship co-funded by Excellence Department Project DIBAF and the EU Project HIGHLANDER
	Curriculum in *Forest Ecology and environmental technologies* n. 1 scholarship co-funded by Excellence Department Project DIBAF and the Research Agreement with the Parco Monti degli Ausoni. n. 1 scholarship co-funded by Excellence Department Project DIBAF and PON-MISE project n. 1 scholarship co-funded by University of Tuscia and ENVRI-FAIR project n. 1 scholarship co-funded by University of Tuscia and the MACH foundation n.1 scholarship co-funded by University of Tuscia and the CMCC foundation n.1 scholarship co-funded by University of Tuscia and the NATURE 4.0 Ltd
	Curriculum in *Biological systems/ Bioindustries* n. 1 scholarship co-funded by University of Tuscia and the EU project HIGHLANDER n. 1 scholarship co-funded by University of Tuscia and the Istituto Bambin Gesù n. 1 scholarship funded (100%) by the EU project ALPHEUS
	International curriculum in *Urban Green Infrastructures and Sustainable Development* n. 2 position with scholarship provided by RUDN University (Moscow, Russia) and reserved for candidates who have been admitted to the 1st year of the *Postgraduate course direction 03.02.08 Ecology* at the same University, beginning in the 2020-21 academic year.

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, 2020. 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 within the section "Didattica" ("Dottorati di Ricerca") of the web site of the University of Tuscia (www.unitus.it) 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 2 points University career (exams taken with the relative grades and final grade): max 5 points Scientific publications relating to the areas of Ph.D.: max 4 points Research and/or study activities in foreign institutions: max 2 points Participation in research projects: max 1 points Professional experiences and other qualifications that each candidate considers useful: max 2 points Research project submitted by the candidate: max 4 points Before of the oral exam, the evaluation of academic qualification results will be published on the Tuscia web site www.unitus.it (section "Didattica" > "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 of the following themes: 1) Machine learning and artificial intelligence methods applied to food industry chains (position with a scholarship). **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 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 of the following themes: 1) Evergreen oak decline associated with invasive Phytophthora spp.: structure and functionality of soilborne microbial communities in response of application of Integrated Pest Management (position with a scholarship). 2) Wood chain value and forest circular bioeconomy: technologies to improve wood added value, nanomaterials and functionalizing wood products (position with a scholarship). 3) Technological and methodological developments for measurement, analysis and interpretation of greenhouse gases exchanges between ecosystems and atmosphere (position with a scholarship). 4) Technological innovation for forest management (position with a scholarship). 5) Climate Change impacts on forests, use of models, observations and big data analytics (position with a scholarship). 6) Technological development for edge computing applications to environmental monitoring (position with a scholarship). 7) Innovative legal and governance issues for the development of urban forests and of the Biocities concept in Italy and Europe: applications to the case study of metropolitan Rome (position with no scholarship). 8) Analysis of the EU politics on 'green deal' and the potential of adaptation to climate changes of the Italian Regions (position with no scholarship). **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, and, specifically, will focus on the discussion of the research project presented by the candidate, which must be in line with the following theme:

	1) Low Head Pumped Hydro impacts and marine envornmental sustainability assessment: identification of the interactions between marine environmental components, technology and fish survival through the use of MSFD descriptors and GIS implementation for decision making and siting support. (position with a scholarship). 2) Computational methods for functional genomics (position with a scholarship). 3) In vivo experimental approaches for functional genomics (position with a scholarship). International curriculum in ***Urban Green Infrastructures and Sustainable Development*** The oral exam will be aimed at assessing the candidate's knowledge of the basic issues within the urban ecosystem and green technologies that can be used to reduce the environmental impact of urbanised areas. In particular, the oral test will focus on the discussion of the research project proposed by each candidate in the following theme: 1) Coping with soil pollution in urban environment (position with scholarship) 2) Analyses of green infrastructures in urban environment (position with scholarship)
Exam dates and locations	**Oral exam** Date: **15 and 16 September, 2020** Place: Aula Rotonda - Dipartimento per la Innovazione nei sistemi biologici, agroalimentari e forestali (DIBAF) Via S. Camillo de Lellis snc - Viterbo Time: 10.30 a.m.
Contact to information	Head of the curriculum *Food Products* Prof. Fabio Mencarelli e-mail mencarel@unitus.it Head of the curriculum *Forest Ecology and Environmental Technologies* Prof. Dario Papale e-mail darpap@unitus.it Head of the curriculum *Biological systems/ Bioindustries* Prof. Maurizio Petruccioli e-mail petrucci@unitus.it Head of the curriculum *Urban Green Infrastructures and Sustainable Development* Prof. Paolo De Angelis e-mail pda@unitus.it