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## SHORT INTENSIVE COURSES<sup>1</sup>

- *ON-LINE* -

**Course title:** REMEDIATION OF POLLUTED SITES

**Linked to the Internship programme:** Remediation & Phytotechnologies

**Edition:** 2019

**Academic coordinator:** Prof. Paolo De Angelis - University of Tuscia - Viterbo, Italy

**Duration:** 16 hours of class lectures + 6 hours of practical training

### ENTRY REQUIREMENTS:

- ✓ to be currently enrolled in one the TAURUS partner Universities (<https://www.taurus-erasmus.eu/consortium/consortium/>)
- ✓ to have a university level knowledge on ecology, biology, chemistry
- ✓ additional knowledge and experience on the issues of pollution and reclamation will be particularly appreciated

### GENERAL OBJECTIVES

Provide an updated overview on soil and water pollutions in urban and peri urban areas of Europe.

Provide the basic knowledge on the remediation technologies currently in use, at national and international level.

Provide the basic element of sustainability criteria applied to the remediation activities

### COURSE CONTENTS

General introduction: soil and water pollution as consequence of human activities; urbanisation and industrialisation trends; human health and ecosystem services. Soil pollution in EU and Italy. Remediation technologies: site securing. Remediation technologies: an overview. Green & Sustainable remediation: concepts and examples. Sustainability of remediation designs.

### EXPECTED LEARNING OUTCOMES

A better understanding of the sources of pollution, remediation strategies and technologies suitable for site regeneration in different context.

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<sup>1</sup> Students of the TARUS Consortium may follow “on-line” specialistic courses on topics / methodologies related to the internship programmes organised by TAURUS Universities. An active participation is mandatory for the students selected for the Internship (trainee). The courses are free of charge and open to the registered students up to the maximum reported in the programme. A final certificate of participation will be provided by the organising University.



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## ACADEMIC COORDINATOR

	<p><b>Prof. Paolo DE ANGELIS, PhD</b>, is Full Professor at the University of Tuscia - Italy. The main scientific area is on <i>Plant &amp; Tree Ecophysiology</i>, with emphasis on the study of the impacts of climate changes (temperature, drought, elevated atmospheric CO<sub>2</sub> concentration) and pollutants on trees, forests and shrubland. In the sector of <i>Environmental Phytotechnologies</i>, he coordinates designs, tests and pilot solutions for the application of phytoremediation to specific polluted sites and for different matrix: soil, water, sediment. In the sector of rural and urban forestry, he contributes to reforestation projects mainly focused on environmental targets. Publications: <a href="https://orcid.org/0000-0001-8310-8831">https://orcid.org/0000-0001-8310-8831</a></p>
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## LECTURERS

	<p><b>Eng. Andrea SCONOCCHIA, PhD</b>, graduated in Environmental and Territory Engineering, he is a PhD in Materials Engineering. He has been operating in the environmental sector since 1996, mainly dealing with the waste sector and, since 2000, with the remediation of contaminated sites. He currently works in ARPA Umbria, is a member of the REMTECH Steering Committee, coordinates the group on phytoremediation of the RECONNET network, participates in various national work groups on remediation and since 2008, in collaboration with the University of Tuscia and CNR, follows projects aimed at the development and consolidation of phytoremediation and restoration of contaminated and degraded sites. He is among the promoters of the REMIDA working group.</p>
	<p><b>Dr. Marco FALCONI</b>, holds two Master degrees in Environmental Science (2001) and in Geology (2010). He has been working with ISPRA (Italian Institute for Environmental Protection and Research) since 2003. His main activity in ISPRA is to support the Italian Ministry of Environment, Land and Sea in the technical control of the Characterization Plans, Risk Analysis, Reclamation Projects, Monitoring Plans, Emergency Safety measures of the 42 Contaminated Sites of Italian National Priority List. He is author of several reports and guidelines on the topic of land and contaminated sites management with Italian and international institutions. He is member of the IMPEL Expert Team “Water and Land”, member of European Environment Information and Observation Network (EIONET) as NRC for soil. He collaborates or has collaborated with various international institutions such as EEA, European Commission, Joint Research Centre, UN Environment, FAO, and with several universities in Italy and abroad (Georgia State University-USA, University of Paris Est Marne la Vallée-France, Hebei Safea-China, Rajagiri-India).</p>
	<p><b>Dr. Paola GRENNI, PhD</b>, graduated in Natural Science at the University of Trieste (1992), she obtained the PhD in Environmental Science at the University of Milano-Bicocca (2011). Researcher at Water Research Institute of the Italian National Research Council (IRSA-CNR). Since 2000 her main field of interest has been microbial ecology in soil, sediments, surface and ground water. She has been involved in national and international projects on ecosystem contamination (pesticides, their transformation products and fertilizers; pharmaceuticals; PCB)</p>



	and water quality models. Experimental activity has included the application of methods for assessing bacterial abundance, biomass and diversity, including molecular methods such as Fluorescent In Situ Hybridization (FISH). Recently, she has been involved in biocide risk assessment and ecotoxicological databases.
	<b>Dr. Paolo SCONOCCHIA</b> , PhD, graduated in forestry and environmental sciences, he is a PhD in Forest Ecology. He works as a professional technical collaborator in the soil reclamation and waste service of the Agency for the Environment of Umbria. Since 2008 he has been involved in projects based on phytoremediation techniques for the remediation of contaminated sites and the management of environmental criticalities. He is among the promoters of the REMIDA working group

## COURSE STRUCTURE

**Module 1:** THE LEGAL FRAMEWORK OF REMEDIATION IN ITALY (4 hrs). **Lecturer:** Dr. Andrea Sconocchia

**Module 2:** REMEDIATION TECHNOLOGIES: SITE SECURING (2 hrs). **Lecturer:** Dr. Andrea Sconocchia

**Module 3:** SOIL POLLUTION IN EU AND ITALY (2 hrs). **Lecturer:** Dr. Paolo Sconocchia

**Module 4:** PLANTS AND SITE SCREENING: FROM THEORY TO THE APPLICATION (2 hrs). **Lecturer:** Dr. Paolo Sconocchia

**Module 5:** REMEDIATION TECHNOLOGIES: SELECTION CRITERIA AND EXAMPLES (2 hrs). **Lecturer:** Dr. Paolo Sconocchia.

**Module 6:** SUSTAINABILITY OF REMEDIATION DESIGNS. Lecturer (2 hrs): **Lecturer:** Dr. Andrea Sconocchia

**Module 7:** WATER CONTAMINATION: OLD AND NEW CONTAMINANTS (2 hrs). **Lecturer:** Dr. Paola Grenni

## ASSESSMENT & CERTIFICATION

To assess the level of skills acquired at the end of the course, the student will write a short report on the key features of an urban area chosen by him, referring to the different modules of the course. Students who have participate to class activities (>75% of presence) and which obtained positive evaluations of their reports will receive a certificate of participation.

**MAXIMUM NUMBER OF PARTICIPANTS: 10**

## REGISTRATION

For the registration send by email your contact info (name, email, home University, course you are enrolled in, short CV) to the following address: [pda@unitus.it](mailto:pda@unitus.it) writing as subject "TAURUS SIC 2019"



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### **OTHER NOTES**

The material for the Lectures and for the Class activities, will be provided by the organiser to the registered students.

### **SUGGESTED LITERATURE**

An update list (when possible, also digital copies) of the most relevant books and papers will be provided to the students.