Program	13AD – [Master's Degree in Forest Engineering]

Course number and name	
Number	[133000235]
Name	Monitoring and Control of Pollution in Soils, Water and Vegetation
Semester	S2 [(February-June)]

Credits and contact hours	
ECTS Credits	3
Contact hours	30

Coordinator's name	Carlos Calderón Guerrero (carlos.calderon@upm.es)

Specific course information	
Description of course content	
The goal of this course is to provide the basic knowledge necessary to understand and propose solutions, from a technical perspective to environmental problems related to soil and water pollution, once they have arisen, or to prevent them before they aggravate.	
List of topics to be covered	
1. Soil and water pollution: causes and effects. Effects on vegetation. 2. Analysis and practical control of soil and water pollution. Analysis techniques on the vegetation. 3. Management of soil and water pollution. More efficient plant species for the reduction or mitigation of pollution. 4. Case studies on vegetation monitoring and corrective measures for soil and water pollution.	
Prerequisites or co-requisites	
- Control of pollution in the natural environment. Bioremediation. - It is advisable to have a background or at least basic knowledge of Hydrology, Chemistry and Soil science / Climatology / Ecology, as well as computer skills at user level.	
Course category in the program	
__ R (required)	**_X_ E (elective)** *(elective courses may not be offered every year)*

Specific goals for the course

Specific outcomes of instruction

CB06 - Possess and understand knowledge that provides a basis or opportunity for originality in the development and/or application of ideas, often in a research context.
CB07 - Ability to acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to student's field of study.
CB08 - Ability to integrate knowledge and deal with the complexity of formulating judgements on the basis of incomplete or limited information, contemplating the social and ethical responsibilities associated to the application of their knowledge and judgements.
CB10 - Possess the learning skills that will enable them to continue studying manly in a way self-directed or autonomous.
CE 2.5 - Ability to control pollution of the natural environment due to industrial activity and waste management.
CE 6.2 - Knowledge and skills for the environmental improvement of the environment.
CG 02 - Ability to design, direct, elaborate, implement and interpret projects and integral action plans in the natural environment.
CT04 - Critical capacity for analysis, synthesis and learning through the exchange of opinions, presenting solid and structured arguments.
CT06 - Bibliographic search, analysis of documentation and treatment of information from several sources and its analysis and synthesis, applying it to the resolution of complex problems.
CT07 - Improve oral and written knowledge of the English language.
CT08 - Creativity, observation skills, hypothesis generation and experimental problem statement.
RA74 - Apply procedures for the control and correction of atmospheric, soil and water pollution at local, regional and global scales.
RA72 - Analyze and apply the legal framework concerning soil and water pollution, as well as air pollution at local and transboundary level.
RA73 – Assess, from an integrated perspective, possible pollutants and sources of pollution in the agroforestry and urban environment.

Bibliography and supplemental materials

Main book: Calderon Guerrero, Carlos (2014). Urban trees and atmospheric pollutants in big cities: Effects in Madrid. Tesis dissertation. E.T.S.I. Montes, Forestal y del Medio Natural (UPM).

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Teaching methodology			
_X_ **lectures**	_X_ **problem solving sessions**	_X_ **collaborative actions**	_X_ **laboratory sessions**
Other:	- Sample collection in Madrid and analysis of the samples in the laboratory. - Practical exercises in the computer classroom with GIS spatial analysis software. - .		