Degree level: Master degree	
Course Title: Phytoindication and phytoremediation	
Course status: Elective	
ECTS: 6	
Requirements: none	
Learning objectives:	

Learning objectives:

The aim of the course is to introduce students with specific and significant role of plants in phytoremediation and phytoindication of polluted sites.

Learning outcomes:

Upon completion of this course, students will be able to recognise different sources of contamination of the environment, and to understand mechanisms of pollutant uptake by plants and their phytotoxic effects. Special attention is given to tolerance mechanisms in plant species. Students will understand important role of plants in conservation of the environment, and will be able to apply their knowledge.

Course Content:

Theoretical part

Role of plants in phytoindication. Biological spectrum, ecological indexes and phytocenological elements as bioindicators. Organic and inorganic contamination. Indicators. Contamination of air, soil and water. Uptake of pollutants by plants and their phytotoxicity. Plant tolerance to different contaminants. Adaptations. Characteristics of plants suitable for phytoremediation: woody plants, herbaceous plants, aquatic and semiaquatic plants. Metal accumulators – hyperaccumulators and accumulators. Remediation: application, limitations (characteristics of roots, growth rate, pollutant concentration), economic and technical aspects, conservation of ecosystems. Phytoremediation mechanisms. Phytoextraction. Phytodegradation. Rhizofiltration. Rhizodegradation. Phytostabilization. Phytovolatilization. Phytoremediation techniques. Phytoengineering and phytosanation. Worldwide and European experiences.

Practical part

Cultivation of plants with addition of excessive amounts of pollutants (heavy metals, organic pollutants). Determination of pollutants in plant tissues. Bioconcentration degree of certain pollutants. Collection of plant samples in the field. Activity of specific enzymes in relation to concentration of pollutants.

Total hours:				
Lectures: 2	Practical lessons:	Other: 2	Student research work: 5	