

Jan Evangelista Purkyně University in Ústí nad Labem

Faculty of Environment

## Study material

### PHYTOREMEDIATIONS

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EUROPEAN UNION  
European Structural and Investment Funds  
Operational Programme Research,  
Development and Education



STUVIN - Education, research and innovation of science and technical doctoral programmes  
on J. E. Purkyně University in Ústí n.L., reg. n. CZ.02.2.69/0.0/0.0/16\_018/0002735

## Objectives

The course is focused on the detailed understanding of various methods of using plants during remediations of contaminated sites. The course aims both on the biological background of the processes (biochemistry, physiology, ecology) as well as on the applicability of the processes (selection of plants, support of their survival, dealing with the biomass etc.). Case studies are also presented.

## Study topics

1. Basic information – variants of phytoremediation, advantages and disadvantages, practical applicability, comparison to other remediation methods.
2. Biological background of phytoremediations – chemical composition of plants, plant tissues, photosynthesis, uptake and distribution of nutrients and pollutants into plant parts, metabolic changes, transpiration
3. Collaboration between plants and microorganisms during phytoremediations – root exudation, rhizosphere microorganisms, rhizoremediation, mycorrhiza, actinorrhiza
4. Plant species used for phytoremediations
5. Soil quality parameters changes during phytoremediations
6. Plant stress and its measurement
7. Phytoremediations with biomass production, use second generation energy crops
8. Examples and case studies
9. Genetic engineering and its applicability for phytoremediations
10. Future prospects

## Study literature

ANON., 2000. Phytoremediation of contaminated soil and water, Boca Raton, Lewis Publishers.

ANON., c2003. Phytoremediation: transformation and control of contaminants, Hoboken, Wiley-Interscience.

MACKOVA, M., DOWLING, D., AND MACEK, T., 2006. Phytoremediation and Rhizoremediation, Amsterdam, Springer.

ERRICKSON L. AND PIDLISNYUK V., 2021. Phytotechnology with biomass production, London, CRC Press, open access, <https://doi.org/10.1201/9781003082613>