

# ENVIRONMENTAL ANALYSIS, ASSESSMENT AND MONITORING

(Environmental management and protection, 1<sup>st</sup> Year of study, 1<sup>st</sup> Semester)

**Credit value (ECTS): 6**

**Course category: Further study (mandatory)**

**Course holder: Assoc. prof. Raluca-Maria HLIHOR, PhD**

## Objectives of the discipline (course and practical activity)

The course *Environmental analysis, assessment and monitoring* aims to provide advanced specialized information on innovative solutions to environmental management through the monitoring and assessment of environmental quality, where sustainability is a priority.

## Contents (syllabus)

Course (chapters/subchapters)
<b>1. Environmental quality analysis, assessment and monitoring</b> Environmental assessment tools for measuring the state and changes in the environment, supporting the development and implementation of environmental policies
<b>2. Environmental management</b> Principles, integrative aspects and the contribution of integrated management in ensuring environmental sustainability
<b>3. Monitoring persistent pollutants in the environment</b> Sources and classification Effects of persistent pollutants on environmental compartments and human health
<b>4. Treatment processes for wastewater contaminated with persistent pollutants</b> Conventional and unconventional processes
<b>5. Bioavailability of persistent pollutants in soil in relation to their uptake by plants</b> Implications, stress and defensive response initiators in relation to plant secondary metabolism Biomonitoring of soil pollutants using plants
<b>6. Monitoring and management of waste electrical and electronic equipment (WEEE)</b> Sources, composition, effects, environmental strategies
<b>7. Process modeling and optimization in environmental quality analysis, assessment and monitoring</b>

Practical activity
1. General and specific instructions for work, occupational health and safety - Laboratory applications.
2. Water, air and soil sampling for laboratory analysis. Analysis of water quality indicators (dissolved oxygen, conductivity, pH, total dissolved solids) in the field using the Hanna HI 9828 portable multi-parameter.
3. Monitoring, identification and analysis of selected categories of pollutants resulting from industry and agriculture for a water course.
4. Monitoring adsorption-desorption processes of environmental contaminants in batch mode.
5. Modeling the adsorption process of persistent pollutants in the environment. Kinetic and equilibrium models.
6. Biomonitoring of contaminated soils with bioindicator plant species.
7. Identification of growth mechanisms of bioindicator plant species under abiotic stress caused by contaminants in soils.
8. Overview. Final conclusions on the analysis performed. Laboratory colloquium.

## Bibliography

1. Anjum N., Gill S., Tuteja N., (Ed.), 2017 - *Enhancing cleanup of environmental pollutants, Volume 1: Biological approaches*, ISBN 978-3-319-55426-6, Springer Science+Business Media (New York), pp. 289-315, DOI 10.1007/978-3-319-55426-6\_14.
2. Artiola J., Pepper I.L., Brusseau M.L., 2004 - *Environmental monitoring and characterization*, Elsevier Science & Technology Books.
3. Ciolpan O., 2005 - *Monitoringul integrat al sistemelor ecologice*, Ed. Ars Docendi, București.
4. Crețescu I., Șoreanu G., 2013 - *Tehnologii de achiziție, monitorizare și diagnoză a factorilor de mediu*, Ed. Ecozone, Iași.
5. Gavrilescu M. (Ed.), Diaconu M., Bulgariu L., Volf I., Catrinescu C., Smaranda C., Cozma P., Hlihor R.M., Ghinea C., Apostol L.C., Comăniță E.D., Roșca M., Vasilică S.I., 2019 – *Explorarea și exploatarea abilităților microorganismelor și a interacțiunilor dintre acestea pentru bioremedierea mediului*, Ed. Performantica, Iași.
6. Gavrilescu M., Crețescu I., Măluțan T., Puițel A., Smaranda C., Cozma P., Hlihor R.M., Ghinea C., Simion I.M., Comăniță E.D., Roșca M., Câmpean T., 2018 - *Strategii și soluții pentru eco-inovarea și eco-proiectarea unor procese și produse din materiale reciclabile în contextul economiei circulare*, Ed. Politehnia, Iași.
7. Ghiga S.C., Simion I.M., Filote C., Roșca M., Hlihor R.M., Cozma P., Gavrilescu M., 2023 - *Sources, composition and management strategies of waste electrical and electronic equipment: a review*, Environmental Engineering and Management Journal, Vol. 22, No. 3, 509-526.
8. Hlihor R.M., Simion I.M., Zaleschi-Hagiu L., Apostol M., Rosca M., Daraban G. M., 2022 - *Stresul indus de metalele grele asupra plantele medicinale și caracterizarea riscurilor pentru sănătatea umană*, Ed. “Ion Ionescu de la Brad”, Iași.
9. Hlihor R.M., Simion I.M., Filote C., Rosca M., Cozma P., Apostol M., Gavrilescu M., 2022 - *Exploatarea tehnologiilor prietenoase cu mediul în vederea îndepărtării poluanților persistenți din apele uzate*, Ed. “Ion Ionescu de la Brad”, Iași.

## Evaluare finală

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Written examination	70%
Evaluation of the activity during the semester	Written and oral assessments during the semester Laboratory colloquium	30%

## Contact

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