ECOTOXICOLOGY

(Management and Environmental Protection, 1st Year of study, 1st Semester)

Credit value (ECTS): 7

Course category: Synthesis study (mandatory)

Course holder: Assoc. Prof. PATRAS Antoanela, PhD

Objectives of the discipline (course and practical works)

Specialized knowledge of ecotoxicology, necessary to correctly solve the specific problems that the future specialists will encounter.

Knowledge of the operation principles of specific ecotoxicology laboratory technique and of the methods for the study of the main ecotoxic substances.

Contents (syllabus)

Course (chapters/subchapters)
Ecotoxicology and implications for the health of ecosystem.
Ecotoxicological assessment of different classes of substances. Factors influencing the ecotoxicity
Bioaccumulation in terrestrial ecosystems. Accumulation of contaminants in plants. Contaminant accumulation in invertebrates. Transfer of contaminants along the food network
Biological magnification. Bioamplification in aquatic systems (uptake of contaminants from food, sediments, etc.)
Bioconcentration and bioamplification factors
Biodegradation of toxic compounds in the environment. Factors influencing biodegradation processes (chemical structure, environmental conditions, bioavailability). Aerobic biodegradation. Anaerobic biodegradation. Persistence of toxic substances in the environment
Ecotoxic mode of action of different classes of substances (dioxins, chlorofluorocarbons, etc)
Approaches to soil ecotoxicology. Modern soil testing and bioremediation strategies
Perspectives for water ecotoxicology approach. Modern strategies of water bioremediation
Practical activity
General considerations of ecotoxicological analysis
Determination of heavy metals in different environmental components (soil, water, plants)
Testing innovative techniques for the removal of heavy metals from wastewater by adsorption on recycled biomaterials - 3 Practicals
Determination of phthalates in drinking water by HPLC with UV detection
Spectrophotometric determination of hydroxymethylfurfural by the White method
Determination of dioxins in the environment
Determination of organochlorinated pesticide residues in different components of the environment (soil, water and pollen) - 3 Practicals
Determination of M1 aflatoxin by high performance liquid chromatography (HPLC)
Determination of microplastic pollution in aquaculture.
Final laboratory test. Discussion. Conclusions.

Bibliography

1. Costache Cristina, Modrogan Cristina, Ecotoxicologia și evaluarea riscului, Editura Agir, 2006

2. Gavrilescu Elena, Noțiuni generale de ecotoxicologie, Editura Sitech, Craiova, 2008
3. Prisăcaru Cornelia, Prisăcaru Anca Irina, Ecotoxicologie, Editura Tehnopress, Iași, 2013
4. Schuurmann Gerrit, Markert Bernd, Ecotoxicology, Editura Wiley, 1998
5. Tamba Berehoiu Radiana Maria, Mic tratat de ecotoxicologie, Editura: Ars Docendi, Bucureşti, 2014
6. Căldăraru Florin, Căldăraru Mira, Metode de măsurare şi monitorizare a parametrilor de calitate a mediului, Editura Cavallioti, București, 2010
7. Gliga Olesea, Conținutul reziduurilor de pesticide organoclorurate în componentele mediului ambiant, Intellectus, 2/2015
8. Oros Vasile, Elemente de ecotoxicologie si teste ecotoxicologice, Editura Risoprint, Cluj-Napoca, 2011.
9. Pohonţu Corneliu, Ecotoxicologia în practica de labotator, Editura Performantica, Iaşi, 2016
10. Tudor Iuliana Mihaela (editor), Ghid metodologic de monitorizare a factorilor hidromorfologici, chimici şi biologici pentru apele de suprafaţă din rezervaţia biosferei Delta Dunării, Institutul National de Cercetare-Dezvoltare Delta Dunării– Tulcea, Editura Centrul de Informare Tehnologică Delta Dunării, 2015

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Final exam	Written / oral examination	60%
Evaluation of the activity during the semester	Written and oral assessments during the semester	40%

Contact

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