Impact studies methodology
(IIIrd YEAR, VIIth SEMESTER)

Credit value (ECTS): 4

Course category
Specialty discipline (Compulsory courses)

Discipline code: A.PCM.S.310

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

Discipline objectives (course and practical works)
Knowledge of the specific methodology, techniques and methods for the elaboration of environmental impact studies, of the legal provisions on the procedure for the approval and authorization of anthropogenic activities with environmental impact and formation of specific skills for environmental impact and risk assessment.

Contents (syllabus)

Course (chapters)
Study object – Impact studies methodology
1. Prevenirea și controlul integrat al poluării 1. Integrated pollution prevention and control 1.1. The need for integrated pollution prevention and control. 1.2. The unsustainable modern economic system. 1.3. Pollution prevention in the context of sustainable development. 1.4. Environmental Impact Assessment (EIA). 1.5. Integrating the concepts of Circular Economy (CE) and Environmental Impact Assessment (EIA).
2. Quality of environmental factors in impact assessments 2.1. Assessment of the quality of environmental factors (water, air, soil). 2.2. Types of impact assessments.
3. Components of the Environmental Impact Assessment 3.1. Environmental Impact Assessment Report (EIR). 3.2. Environmental Balance Sheet (EB). 3.3. Environmental Risk Assessment (ERA).
4. Environmental Impact Assessment 4.1. General aspects. 4.2. Objectives. 4.3. Stakeholders. 4.4. Evolution of the process. 4.5. Environmental Impact Assessment. 4.6. Regulatory framework for Environmental Impact Assessment at national and international level. Challenges of the EIA process. 4.7. Public involvement in the EIA process.

5. Types and scope of impacts analyzed in an EIA procedure 5.1. Identifying relevant issues and questions at the start of a project. 5.2. Steps in building an EIA system.
6. Procedural steps in the EIA process 6.1. Screening. 6.2. Scoping. 6.3. Reporting.
7. Quantification of environmental impacts using specific methods and techniques. 7.1. General aspects. 7.2. Environmental impact assessment methodologies. 7.3. Check-list method. 7.4. Impact matrices.
8. Environmental and human health impact and risk assessment 8.1. Steps to assess the environmental and human health impacts and risks arising from exposure to pollutants generated in the environment.
9. Life cycle assessment of processes and products 9.1. Introduction to Life Cycle Assessment (LCA). 9.2. Conceptual and methodological framework of LCA. 9.3. Definition of purpose and scope. 9.4. Life cycle inventory analysis. 9.5. Impact assessment through life cycle assessment for processes and products.

Lucrări practice
Quantification of the environmental impacts of industrial and agricultural activities **1. Guidelines for writing and defining the stages of work** Description and establishment of the research topic, importance, aim, objectives, objectives, material and working method
2. Site description
3. Identification of pollution sources and pollutants 3.1. Description of the technological process - Process diagrams, technological flowsheets. Inputs of materials, outputs of pollutants, separation of products. 3.2. Pollution sources and contaminants for surface water - Guidance on emissions to surface water. 3.3. Pollution sources and contaminants for groundwater - Guidance on releases to groundwater. 3.4. Pollution sources and contaminants for soil - Guidance on releases to soil. 3.5. Pollution sources and contaminants for air - Guidance on releases to air. 3.6. Sources of pollution and contaminants for human health - Inventory of toxic and hazardous substances.
4. Quantifying the environmental impacts by different methods 4.1. Description of the selected method for quantifying environmental impacts 4.2. Application of the selected method for quantifying environmental impacts
5. Environmental impact assessment
6. Summary and evaluation.

References

1. Bica I., 2004 - *Elemente de impact asupra mediului*, Ed. Matrix, București.
2. Fortună M.E., Simion I.M., Ghinea C., Petraru M., Cozma P., Apostol L.C., Hlihor R.M., Tudorache Fertu D., Gavrilescu M., 2012 - *Analysis and management of specific processes*

from environmental engineering and protection based on sustainability indicators, Environmental Engineering and Management Journal, 11, 333-350.
3. Gavrilescu M., 2008 - *Evaluarea și managementul riscului*, Ed. Politehnum, Iași.
4. Gavrilescu M. (coordonator), 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. Politehnium, Iași.
5. 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, 22(3), 509-526.
6. Hlihor R.M., Simion I.M., Filote C., Roșca 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.
7. Macoveanu M., 2003 - *Metode si tehnici de evaluare a impactului ecologic*, Ed. Ecozone, Iași.
8. Muntean. O.L., 2005 - *Evaluarea impactului antropic asupra mediului*, Ed. Casa Cărţii de Ştiinţă, Cluj-Napoca.
9. Pastakia C.M.R., Jensen A., 1998 - *The rapid impact assessment matrix (RIAM) for EIA*, Environmental Impact Assessment Revue, 18.
10. Peiu N., 2004 – *Evaluarea ciclului de viață al produselor*, Ed. EcoZone, Iași.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Colloquium	Written evaluation Course attendance	60% 10%
Appreciation of the activity during the semester	Oral assessment during the semester, knowledge and interpretation of the specific elements of impact assessment and elaboration of projects with specific topics.	30%

Contact

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