

## Survey and environmental impact studies (ENVIRONMENTAL ENGINEERING, 4th YEAR OF STUDY, 7th SEMESTER)

**Credit value (ECTS) 4**

### Course category

Mandatory

### Course holder

Lecturer Raluca-Maria HLIHOR, Ph.D.

Assist. prof. dr. Isabela Maria Simion

### Discipline objectives (course and practical works)

#### *The general objective of the discipline*

Knowledge of the methodology, techniques and specific methods of elaborating the environmental impact studies and the environmental balance sheet, the legal provisions regarding the approval and authorization procedure of the anthropic activities with significant impact on the environment and the formation of skills for the environmental risk assessment.

#### *Specific objectives of the discipline*

Knowledge of the anthropic impact and effects on the environmental compartments.

Acquiring knowledge on general methods and techniques of environmental impact assessment.

Knowledge of the methodological stages of the environmental impact assessment procedure.

Acquiring the knowledge necessary to obtain information useful for the preparation and writing of an environmental impact assessment report.

Knowledge of operational and legislative principles regarding the environmental impact assessment and the environmental balance sheet.

Knowledge of the process of public participation and consultation.

Knowledge and understanding of decision-making processes.

### Contents (syllabus)

Course (chapters/subchapters)
<b>1. Integrated pollution prevention and control</b> 1.1. The need for integrated pollution prevention and control 1.2. The unsustainable modern economic system 1.3. Sustainable Development 1.4. Pollution prevention in the context of sustainable development
<b>2. Environmental impact assessment (EIA) and strategic environmental assessment (SEA) - defining and approaching the evaluation</b>
<b>3. Purpose and evolution of the legislation on environmental impact assessment in Romania</b>
<b>4. Environmental Impact Assessment (EIA)</b> 4.1. Brief history on the evolution of the EIA 4.2. Purpose and objectives of the EIA 4.3. EIA principles 4.4. Types of assessments in EIA 4.5. Limitations

<p><b>5. Tools for environmental impact assessment (EIA)</b></p> <p>5.1. Environmental advice</p> <p>5.2. The environmental agreement</p> <p>5.3. Environmental clearance</p> <p>5.4. Integrated environmental authorization</p> <p>5.5. Environmental Impact Reports (EIRs)</p> <p>5.6. Environmental balance sheet (EBS)</p> <p>5.7. Environmental risk assessment (ERA)</p>
<p><b>6. Types of impacts analyzed through an environmental impact assessment (EIA) procedure and their scope</b></p> <p>6.1. Types of impacts</p> <p>6.2. The organizations and types of personnel involved in EIA</p>
<p><b>7. The stages of building an environmental impact assessment (EIA) system.</b></p> <p>7.1. Project framing stage - Screening</p> <p>7.2. Defining the field of evaluation - Scoping</p> <p>7.3. Defining the field of evaluation and making the report on the environmental impact</p> <p>7.4. Carrying out the report in the evaluation study</p> <p>7.5. Analysis of the quality of the environmental impact report</p>
<p><b>8. Procedures and indicators for environmental impact assessment (EIA)</b></p>
<p><b>9. Negotiation - public involvement in environmental impact assessment (EIA)</b></p> <p>9.1. Purpose of public involvement</p> <p>9.2. The main objectives of public involvement</p> <p>9.3. Levels and forms of public involvement</p> <p>9.4. The benefits of public participation</p> <p>9.5. Principles of public involvement</p>
<p><b>10. Quantifying the impact on the environment by specific methods. Classification and description of methods</b></p>

<b>Practical works</b>
<p><b>Environmental impact assessment of industrial and / or agricultural activities - Case study</b></p> <p>Drafting rules and establishing the work stages</p> <p><b>1. Description and establishment of the research theme, importance, purpose, objectives, materials and methods</b></p>
<p><b>2. Site description</b></p>
<p><b>3. Identification of pollution sources and pollutants</b></p> <p>3.1. Description of the technological process - Block diagrams, schemes of the technological flow. Inputs of raw materials, outputs of pollutants, separation of products</p> <p>3.2. Pollution Sources and Contaminants for Surface Water - Surface Water Emissions Guide</p> <p>3.3. Groundwater Pollution Sources and Contaminants - Groundwater Emissions Guide</p> <p>3.4. Pollution Sources and Soil Contaminants - Soil Emissions Guide</p> <p>3.5. Air Pollution Sources and Contaminants - A Guide to Air Emissions</p> <p>3.6. Sources of pollution and contaminants for human health - Inventory of toxic and dangerous substances</p>
<p><b>4. Environmental impact assessment using the global pollution index method</b></p> <p>4.1. Method description</p> <p>4.2. Quantifying impacts using the global pollution index method</p>

## 5. Analysis of the environmental impact of the existing activities

5.1. Results of the environmental assessment

5.2. Best available techniques

## 6. Review and evaluation

### Bibliography

1. Fortună M.E., Simion I.M., Ghinea C., Petraru M., Cozma P., Apostol L.C., Hlihor R.M., Tudorache Fertu D., Gavrilesu 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.
2. **Ordinul 863 din 26 septembrie 2002** privind aprobarea ghidurilor metodologice aplicabile etapelor procedurii-cadru de evaluare a impactului asupra mediului.
3. **Ordinul nr. 864/2002** pentru aprobarea Procedurii de evaluare a impactului asupra mediului în context transfrontieră și de participare a publicului la luarea deciziei în cazul proiectelor cu impact transfrontieră.
4. **Macoveanu M., 2003** - *Metode si tehnici de evaluare a impactului ecologic*, Ed. Ecozone, Iași.
5. **Muntean O.L., 2005** - *Evaluarea impactului antropic asupra mediului*, Ed. Casa Cărții de Știință, Cluj-Napoca.
6. **Nicu M., 2001** - *Bilanțuri de mediu*, Ed. Tehnică, Iași.
7. **Pastakia C.M.R., Jensen A., 1998** - *The rapid impact assessment matrix (RIAM) for EIA*, Environmental Impact Assessment Revue, 18.
8. **Petter M., Riki T., 1995** - *Methods of Environment Impact Assessment*, UCL Press Ltd., London.
9. **Robu B., 2005** - *Evaluarea impactului și a riscului induse asupra mediului de activități industriale*, Ed. Ecozone, Iași.
10. **Robu B., 2010** - *Evaluări de mediu pentru dezvoltarea durabilă*, Ed. EcoZone, Iași.

### Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	70%
	Course attendance	10%
Practical works	Knowledge of specific tools; processing and interpretation of results; power point presentation	20%

### Contact

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## Survey and environmental impact studies (ENVIRONMENTAL ENGINEERING, 4th YEAR OF STUDY, 8th SEMESTER)

**Credit value (ECTS) 3**

### Course category

Mandatory

### Course holder

Lecturer Raluca-Maria HLIHOR, Ph.D.

Assist. prof. dr. Isabela Maria Simion

### Discipline objectives (course and practical works)

#### *The general objective of the discipline*

Knowledge of the methodology, techniques and specific methods of elaborating the environmental impact studies and the environmental balance sheet, the legal provisions regarding the approval and authorization procedure of the anthropic activities with significant impact on the environment and the formation of skills for the environmental risk assessment.

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Knowledge of the methodological stages of the environmental impact assessment procedure.

Acquiring the knowledge necessary to obtain information useful for the preparation and writing of an environmental impact assessment report.

Knowledge of operational and legislative principles regarding the environmental impact assessment and the environmental balance sheet.

Knowledge of the process of public participation and consultation.

Knowledge and understanding of decision-making processes.

### Contents (syllabus)

Course (chapters/subchapters)
<b>1. Methods and techniques for environmental impact assessment (EIA)</b> 1.1. General aspects 1.2. Techniques that support environmental impact assessment
<b>2. Checklists in Environmental Impact Assessment</b>
<b>3. Evaluation of the quality of environmental factors</b> 3.1. Air quality environmental impact assessment 3.2. Water quality environmental impact assessment 3.3. Soil quality environmental impact assessment 3.4. Human health impact assessment 3.5. Ecological impact assessment
<b>4. Environmental impact matrices</b> 4.1. Environmental indicators used in the environmental impact assessment (EIA) procedure 4.2. Global pollution index method 4.3. Simple interaction matrix method (Leopold's matrix) 4.4. Rapid environmental impact assessment (REA) method

<p><b>5. Environmental and human health risk assessment</b></p> <p>5.2. Introduction</p> <p>5.2. Description of the stages of environmental and human health risk assessment posed by exposure to pollutants from different activities</p>
<p><b>6. The environmental balance</b></p> <p>6.1. Definition and classification of balance sheet types</p> <p>6.2. Issue and methodology of environmental balances</p>

Practical works
<p><b>1. Methods and techniques used in environmental impact assessment (EIA)</b></p> <p>Summary - Global Pollution Index Method</p>
<p><b>2. Simple interaction matrix (Leopold's matrix) - applicability in environmental impact assessment studies</b></p>
<p><b>3. Rapid environmental impact assessment matrix (REA) - applicability in environmental impact assessment studies</b></p>
<p><b>4. Participants in the environmental impact assessment (EIA) procedure</b></p>
<p><b>5. Environmental balance sheet – 0 order</b></p>
<p><b>6. Environmental balance sheet – 1st order</b></p>
<p><b>7. Environmental balance sheet – 2nd order</b></p>
<p><b>8. Review and evaluation</b></p>

Project
<p>Quantifying the environmental impact of industrial and / or agricultural activities - Case study</p> <p>Drafting rules and establishing the structure of the project. Description and establishment of the research topic</p>
<p><b>1. Site description</b> of the industrial and / or agricultural activity chosen as a case study and identification of pollution sources and pollutants</p>
<p><b>2. Description of the technological process</b></p>
<p><b>3. Pollution sources and contaminants for water, air and soil.</b> Specific emissions guide for each environmental category</p>
<p><b>4. Environmental impact assessment based on a specific method</b></p> <p>4.1. Method description</p> <p>4.2. Quantifying environmental impacts</p> <p>4.3. Interpretation of results</p>
<p><b>5. Review and evaluation</b></p>

### **Bibliography**

- 1. 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.**
- 2. Ordinul 863 din 26 septembrie 2002** privind aprobarea ghidurilor metodologice aplicabile etapelor procedurii-cadru de evaluare a impactului asupra mediului.
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### Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	70%
	Course attendance	10%
Practical works	Knowledge of specific tools; processing and interpretation of results; power point presentation	20%
Project	Project evaluation	100%

### Contact

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