

# SYLLABUS

## 1. Information about the programme

|                                     |                                               |
|-------------------------------------|-----------------------------------------------|
| 1.1 Higher education institution    | <b>Babeş-Bolyai University of Cluj-Napoca</b> |
| 1.2 Faculty                         | <b>Environmental Science and Engineering</b>  |
| 1.3 Department                      | <b>Environmental Analysis and Assessment</b>  |
| 1.4 Field of study                  | <b>Environmental Engineering</b>              |
| 1.5 Study cycle                     | <b>Bachelor</b>                               |
| 1.6 Study programme / Qualification | <b>Environmental Engineering</b>              |

## 2. Information on the discipline

|                            |                                        |              |          |                         |             |                        |           |
|----------------------------|----------------------------------------|--------------|----------|-------------------------|-------------|------------------------|-----------|
| 2.1 Name of the discipline | <b>Environmental impact assessment</b> |              |          |                         |             |                        |           |
| 2.2 Course coordinator     | Lecturer dr. Vlad Măciacăşan           |              |          |                         |             |                        |           |
| 2.3 Seminar coordinator    | Lecturer dr. Vlad Măciacăşan           |              |          |                         |             |                        |           |
| 2.4. Year of study         | <b>III</b>                             | 2.5 Semester | <b>6</b> | 2.6. Type of evaluation | <b>Exam</b> | 2.7 Type of discipline | Mandatory |

## 3. Total estimated time (hours/semester of didactic activities)

|                                                                                  |     |                      |    |                        |       |
|----------------------------------------------------------------------------------|-----|----------------------|----|------------------------|-------|
| 3.1 Hours per week                                                               | 4   | Of which: 3.2 course | 2  | 3.3 seminar/laboratory | 2     |
| 3.4 Total hours in the curriculum                                                | 56  | Of which: 3.5 course | 28 | 3.6 seminar/laboratory | 28    |
| Time allotment:                                                                  |     |                      |    |                        | hours |
| Learning using manual, course support, bibliography, course notes                |     |                      |    |                        | 22    |
| Other documentation (in libraries, on electronic platforms, field documentation) |     |                      |    |                        | 22    |
| Preparation for seminars/labs, homework, papers, portfolios and essays           |     |                      |    |                        | 22    |
| Tutorship                                                                        |     |                      |    |                        | 8     |
| Evaluations                                                                      |     |                      |    |                        | 2     |
| Other activities: .....                                                          |     |                      |    |                        | 8     |
| 3.7 Total individual study hours                                                 | 70  |                      |    |                        |       |
| 3.8 Total hours per semester                                                     | 126 |                      |    |                        |       |
| 3.9 Number of ECTS credits                                                       | 5   |                      |    |                        |       |

## 4. Prerequisites (if necessary)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1. curriculum   | The knowledge gained through an in-depth study of subjects such as Fundamentals of Environmental Science, Environmental Geography, Soil Science, Meteorology and Climatology, Hydrogeology, Engineering Geomorphology, GIS, Ecology, and Ecological Management enhances the understanding and accessibility of the proposed topics. Additionally, students will strengthen their conceptual foundations by engaging with and building upon their existing knowledge. |
| 4.2. competencies | The continuous application of acquired knowledge ensures a gradually transition between chapters, closely related to the topics of studied subjects.                                                                                                                                                                                                                                                                                                                 |

## 5. Conditions (if necessary)

|                                      |                                                                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 5.1. for the course                  | The room is equipped with a video projector and is suitable for field applications, including in situ evaluations. |
| 5.2. for the seminar /lab activities | The room is equipped with computers, a video projector, a blackboard, and tools for field applications.            |

## 6. Specific competencies acquired

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Professional competencies</b> | <ul style="list-style-type: none"> <li>- Understanding the process and procedures for assessing the anthropogenic impact on the environment, including the concepts of environmental impact and its effects.</li> <li>- Classifying the different types of impacts on environmental components.</li> <li>- Mastering the methods, techniques, and practical procedures for conducting impact assessments.</li> <li>- Assessing and representing impacts using GIS techniques, while considering anthropogenic impact in the context of sustainable development.</li> <li>- Familiarizing oneself with environmental legislation related to the environmental impact assessment (EIA) process.</li> <li>- Analyzing environmental impacts within the framework of ecological planning policies and evaluating the EIA procedures through national and international case studies.</li> <li>- Approaching the strategic and appropriate procedures for impact assessments.</li> </ul> |
| <b>Transversal competencies</b>  | <ul style="list-style-type: none"> <li>- Addressing environmental factors and enhancing impact assessment procedures.</li> <li>- Developing practical skills for interpreting and analyzing environmental constraints and pressures.</li> <li>- Gaining knowledge of the general methods and techniques used in developing environmental studies and reports.</li> <li>- Improving skills essential for transdisciplinary cooperation, effective communication, and building partnership relationships through the application of acquired knowledge and the development of scientific reasoning.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                        |

## 7. Objectives of the discipline (outcome of the acquired competencies)

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.1 General objective of the discipline  | <ul style="list-style-type: none"> <li>- Research on scientific procedures and legislative frameworks for environmental assessment;</li> <li>- Developing the necessary knowledge, skills, and abilities to evaluate human impacts within the current socio-economic context.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 7.2 Specific objective of the discipline | <ul style="list-style-type: none"> <li>- Understanding of the anthropogenic impact on environmental components and its effects.</li> <li>- Development of knowledge and skills related to general methods and techniques for investigating and researching anthropogenic impacts on the environment.</li> <li>- Familiarity with the methodological and administrative stages of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) procedures.</li> <li>- Acquisition of knowledge necessary for gathering useful information needed to prepare and draft an environmental impact report.</li> <li>- Awareness of the operational and procedural-legislative principles governing environmental impact assessments.</li> <li>- Understanding of the participants and groups involved in the EIA and SEA processes.</li> <li>- Knowledge of the processes for information dissemination, participation, and public consultation within EIA and SEA.</li> <li>- Comprehension of the decision-making process involved in EIA and SEA procedures.</li> </ul> |

## 8. Content

| 8.1 Course                                                                                                              | Teaching methods                        | Remarks |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------|
| 1. Environmental impact assessment (process, procedure) – definition, evolution and assessment approach - introduction  | Lecture, Heuristic Conversation         | 2 hours |
| 2. The purpose of addressing evaluation issues. Scientific content and practical significance (analysis and comparison) | Lecture, brainstorming                  | 2 hours |
| 3. Types of assessment. Anthropogenic impact on environmental components (EIA): typology and                            | Group interview, Heuristic conversation | 2 hours |

|                                                                                                                                                                                                                                                                                          |                                                                |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------|
| effects on the environment                                                                                                                                                                                                                                                               |                                                                |         |
| 4. General methodological aspects in EIA. EIA techniques, procedures and indicators (general aspects). Case studies.                                                                                                                                                                     | Lecture, brainstorming                                         | 2 hours |
| 5. General and operational principles in EIA (course material in ppt format)                                                                                                                                                                                                             | Brainstorming, Argumentation                                   | 2 hours |
| 6. Impact assessment vs. strategic impact assessment. Strategic environmental impact assessment (SEI). Appropriate assessment. Political and legislative dimension of environmental assessment (EA)                                                                                      | Lecture, brainstorming                                         | 2 hours |
| 7. EIA and ESI in Romania – content and procedural significance                                                                                                                                                                                                                          | Lecture, brainstorming                                         | 2 hours |
| 8. Participants in the EIA and ESI procedure. Consultation, information and public participation in environmental assessment projects. Information and types of environmental information.                                                                                               | Brainstorming, Argumentation                                   | 2 hours |
| 9. The decision-making process in EIA. The legislative component of EIA. Areas and regions delimited based on impact assessment.                                                                                                                                                         | Lecture, brainstorming                                         | 2 hours |
| 10. Using EIA in practice. The relationship between EIA-EMS (Environmental Management Systems) - EAudit (Environmental Audit). Environmental Impact Assessment and Environmental Audit (Level I and II) – general aspects ; visit to a mining site (integrated environmental assessment) | Lecture, Argumentation, Visit to an mining and industrial site | 2 hours |
| 11. Certification of legal persons who prepare environmental documentation – realities and legislative news                                                                                                                                                                              | Brainstorming                                                  | 2 hours |
| 12. Appropriate assessment (EA) – scientific, practical and legislative content and significance                                                                                                                                                                                         | Lecture, brainstorming                                         | 2 hours |
| 13. Environmental action planning, SWOT analysis of impact assessment projects, environmental decision making, etc.                                                                                                                                                                      | Lecture, brainstorming                                         | 2 hours |
| 14. Preparation and interpretation of environmental impact study (case study) (course material in ppt format)                                                                                                                                                                            | Lecture, brainstorming                                         | 2 hours |
| Bibliography:                                                                                                                                                                                                                                                                            |                                                                |         |
| 1.                                                                                                                                                                                                                                                                                       |                                                                |         |
| 8.2 Seminar / laboratory                                                                                                                                                                                                                                                                 | Teaching methods                                               | Remarks |
| Knowledge and use of specific terminology (glossary of specialized terms); Identification of sources of environmental information; types of data, information, and expertise used in the assessment; application of concepts used in EIA.                                                | Lecture, individual papers, thematic discussions               | 4 hours |
| Collecting data necessary for environmental assessments (checklists, thematic questionnaires, survey method), and interpreting official and scientific data necessary for ecological assessments.                                                                                        | Lecture, group activity, Exercise method, Questionnaires       | 2 hours |
| EIA case studies; development of projects and environmental impact studies (stages and constraints;                                                                                                                                                                                      | Argumentation, Exercise method, Lecture, Brainstorming, Field  | 6 hours |

|                                                                                                                                                                                                   |                                                                                                                               |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------|
| Copșa Mică study case, Cluj-Napoca metropolitan area, etc.). Preparation and analysis of impact maps: case study: monitoring the impact of urban noise in Cluj-Napoca                             | monitoring of urban noise (applied checklist)                                                                                 |          |
| The issue of human impact on historically and currently degraded sites, such as the mining area at Aghireș; integrated environmental assessment; and carrying out individual project assessments. | Field observation, argumentation, and exercise methods: Visiting and evaluating an industrial site for practical application. | 12 hours |
| Thematic projects were presented in front of colleagues and teachers.                                                                                                                             | Thematic presentation: Individual Verification Method                                                                         | 4 hours  |

#### Bibliography:

1. Bailey, G.R., (1996), Ecosystem Geography, Springer, New York-Toronto-Berlin.
2. Jones, A., Duck, R., Reed, R., Weyers, J., (2000), Practical Skills în Environmental Science, Prentice Hall.
3. O’Riordan, T., (2000), Environmental Science for Environmental Management, 2<sup>nd</sup> Ed., Prentice Hall, Harlow.
4. O’Sullivan, M., (1990), Environmental Impact Assessment. A Handbook, REMU, Cork, Ireland.
5. Tivy, J., O’Hare, Gr., (1993), Human Impact on the Ecosystem, Oliver and Boyd, Edinburgh-New York.
6. Ungureanu, Irina, (2005), Geografia mediului înconjurător, Edit. Univ. din Iași.
7. Wamsley, D.J., (1987), Human Geography- Behavioural Approaches, Longman, London.
8. [www.mmediu.ro](http://www.mmediu.ro)
9. <http://www.anpm.ro/web/guest/legislatie>
10. <http://www.eea.europa.eu/ro>
11. <http://www.epa.gov/>
12. <http://www.iaia.org/>
13. <http://ec.europa.eu/environment/eia/home.htm>
14. <http://www.journals.elsevier.com/environmental-impact-assessment-review>
15. Legea 292/2018 privind evaluarea impactului anumitor proiecte publice și private asupra mediului
16. Ordin 1825/2016 Ghiduri EIA publicate în M.Of. 821bis
17. Directiva 2001\_42\_CE\_2001 Evaluare planuri si programe
18. Directiva 2014\_52\_UE EIA
19. <https://land.copernicus.eu/local/urban-atlas>
20. <https://unece.org/environment-policy/environmental-assessment>
21. [https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment\\_en](https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment_en)
22. [https://environment.ec.europa.eu/law-and-governance/environmental-assessments/strategic-environmental-assessment\\_en](https://environment.ec.europa.eu/law-and-governance/environmental-assessments/strategic-environmental-assessment_en)

### 9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

The course content aligns with what is taught at other universities both nationally and internationally. It has been tailored to meet the needs of students and the demands of employers in the field of environmental protection. Feedback from employers about the desired skills for specialists in this area shows a high level of appreciation for the professionalism of our training programs.

### 10. Evaluation

| Type of activity | 10.1 Evaluation criteria        | 10.2 Evaluation methods | 10.3 Share in the grade (%) |
|------------------|---------------------------------|-------------------------|-----------------------------|
| 10.4 Course      | Gaining an understanding of the | Written examination     | 75%                         |

|                             |                                                                                                                                                                                         |                                                              |     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----|
|                             | Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes and procedures. Ability to effectively use terminology specific to EIA and SEA procedures. |                                                              |     |
| 10.5 Seminar/lab activities | Engagement in practical field activities and thematic applications.                                                                                                                     | Classroom activities, fieldwork, and thematic presentations. | 25% |

#### 10.6 Minimum performance standards

Understanding the terms of reference in Environmental Impact Assessment (EIA); defining and classifying environmental impacts and effects; knowledge of the stages and contents of EIA and Strategic Environmental Assessment (SEA) procedures; and participation in field activities.

Date

Signature of course coordinator

Signature of seminar coordinator

December 2, 2024

Date of approval

Signature of the head of department

December 4, 2024