**Nazwa przedmiotu:**

Environmental Impact Assessment

**Koordynator przedmiotu:**

dr hab. inż. Andrzej Kulig, profesor uczelni dr hab. inż. Mirosław Szyłak-Szydłowski prof. uczelni

**Status przedmiotu:**

Obowiązkowy

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Environmental Engineering

**Grupa przedmiotów:**

Obowiązkowe

**Kod przedmiotu:**

1110-ISISR-ISA-7303

**Semestr nominalny:**

7 / rok ak. 2023/2024

**Liczba punktów ECTS:**

4

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

wykład 30 h
projekt 15 h
zapoznanie z literaturą 20 h
przygotowanie się do zajęć projektowych - 5 h
wykonanie i obrona projektu - 15 h
konsultacje - 5 h
przygotowanie się do zaliczenia zajęć projektowych - 10 h
przygotowania do egzaminu i obecność na egzaminie - 20 h
Razem = 120 h

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

2

**Język prowadzenia zajęć:**

angielski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

nie dotyczy

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład: | 30h |
| Ćwiczenia: | 0h |
| Laboratorium: | 0h |
| Projekt: | 15h |
| Lekcje komputerowe: | 0h |

**Wymagania wstępne:**

Economics and Law in Environmental Engineering (L+E)

**Limit liczby studentów:**

brak

**Cel przedmiotu:**

The objective of the module is to familiarise the students with the environmental impact assessment procedures to be followed in case of the planned projects and existing facilities. The guided projects, supplemented with the information communicated during lectures, provide the students with the knowledge of formal and legal procedures and give them skills required to carry out environmental impact assessments and ecological surveys, and produce formal reports which form the basis for administrative (e.g. environmental) decisions

**Treści kształcenia:**

Contents of lectures (syllabus)
Introductory issues. Environmental impact at the stage of implementation, operation and liquidation of a facility; and assessment of that impact. Basic definitions.
Brief history of environmental impact assessments globally, in the EU and in Poland. International principles and regulations (directives and conventions) applicable to environmental impact assessments.
Legal basis for environmental impact assessment procedures in Poland – evolution of regulations and their final status. Types of projects affecting the condition of the environment (policies, plans and programmes, and investment projects). Strategic Environmental Assessments (SEA).
Investment process in the context of environmental protection requirements. Technical objectives and types of environmental impact assessments (screening). Formal and legal procedures of environmental impact assessment – analysis of patterns. Environmental Impact Assessment in a Transboundary Context.
Formal procedure of environmental impact assessment at the project planning stage. Schedule of assessment procedures. Environmental impact assessment procedure for small investment projects. Decision on environmental conditions of project implementation.
Assessment methods and techniques. Source materials in environmental impact assessments. Use of environmental monitoring data. Determination of the scope for environmental impact assessment (scoping). Descriptive checklists.
How to make the assessments more detailed (from qualitative to quantitative). Environmental impact assessment methods: scaled and weighted checklists, matrices, overlay matrix, network interrelation matrix, environmental status comparison matrix, mathematical modelling.
Alternatives of solutions in environmental impact assessments. Extraordinary environmental hazards and their assessment.
European Ecological Network Nature 2000 and its implications for SEA and EIA procedures.
Ex-post assessments and ecological surveys (ES). General principles of and formal requirements to be met by the surveys. ES of contaminated areas. Detailed ES procedures (privatisation processes, environmental management, solid waste management).
Examples of environmental impact assessments produced for industrial, infrastructure (road, railroad etc.) and municipal projects.
Environmental impact of wastewater and solid waste management facilities. Sources and types of the impact. Assessment of the wastewater treatment plant and solid waste dumping site impact range. Active and passive methods of reducing unfavourable impact.
Public participation in environmental impact assessment procedures. Formats and techniques of consultation exercises involving the general public. Role of an investor and environmental protection authorities in the environmental impact assessment procedure.
Environmental Impact Report – principles of elaboration and formal requirements. Assessment authors. Environmental impact assessment commissions and their powers.
Contents of guided projects
Principles of granting credit for the module, division into groups. EU and national legislation, and readings facilitating production of an environmental impact assessment report. Brief characteristics of environmental impact assessment.
Description of individual groups of projects. Formal and legal requirements towards individual groups of projects. Selection of topics on the basis of the Resolution issued by the Cabinet. Decision on underlying environmental conditions: characteristics.
Presentation of the scope of the report. Description of the planned project: its location, conditions of land use in the phase of construction and operation. Selection of location for the chosen project.
Description of analysed variants of the planned projects. Expected types and amounts of contaminants resulting from the operation of the planned project. Technological diagrams.
Description of natural elements of the environment covered by the scope of the expected impact. Natura 2000 Sites: brief characteristics.
Description of proposed technical and technological solutions. Presentation of alternative solutions.
Expected impact on individual environmental elements at the stage of construction, operation and liquidation. Presentation of environmental impact assessment methods which have been employed.
Leopold’s matrix.
Description of expected activities aimed at prevention, reduction or compensation of unfavourable impact.
Analysis of possible social conflicts. Suggested methods of avoiding or minimising them.
Presentation of proposed monitoring of a project impact at the construction and operation stage.
Verification of obtained results. Analysis of limitations and difficulties. Production of a final environmental impact assessment report.
Presentation of final reports. Guided project wrap-up and making out of grades.

**Metody oceny:**

Lectures: Exam – credit in a written format. Project: Attendance, preparation of a project and successful completion of the guided project exercises (defence of the project). Integrated grade = lecture grade x 0.6 + project exercise grade x 0.4

**Egzamin:**

tak

**Literatura:**

[1] Pierzynski G. M., Sims J. T., Vance G.F.: Soils and Environmental Quality. 3rd ed. CRC Press. Taylor & Francis Group. Boca Raton 2005.
[2] Schaetzl R. J., Thompson M. L.: Soils. Genesis and Geomorphology. 2ed ed. Cambridge University Press. Cambridge New York 2015.
[3] Tarbuck Edward J., Lutgens Frederick K.; Ilustrated by Tasa Dennis: Earth. An Introduction to Physical Geology. Pearson Education Limited. Essex 2017.
[4] Schwab G. O., Fangmeier D. D., Elliot W. J., Frevert R. K.: Soil and Water Conservation Engineering. 4ed ed. John Wiley & Sons. Inc. Toronto, New York 1993.
[5] Stallings J. H.: Soil conservation. Prentice-Hall, Inc. Englewood Cliffs, New York 1957
[6] Hemond H. F., Fechner E. J.: Chemical Fate and Transport in the Environment. Academic Press, New York 1994.
[7] Trace Elements in Soils. Ed. By P. S. Hooda. Wiley. Chichester.
[8] Remediation of Soil and Groundwater: Opportunities in Eastern Europe. Proceedings of the NATO Advanced Research Workshop on Remediation of Soil and Groundwater. Ed. by E. A. MacBean, J. Balek, B. Clegg. Kluwer Academic Publ., Dordrecht 1996.
[9] Selected scientific and technical publications (bibliography items) from magazines.
[10] Selected Internet resources (credible website sources only with accurate indication of the website address).
[11] Instructions of laboratory’s examinations.

**Witryna www przedmiotu:**

**Uwagi:**

## Charakterystyki przedmiotowe

### Profil ogólnoakademicki - wiedza

**Charakterystyka W01:**

Posiada podstawową wiedzę o cyklu życia produktów, obiektów lub instalacji. Posiada szczegółową wiedzę z ochrony środowiska w zakresie wybranych chemicznych i biologicznych technik i metod stosowanych w inżynierii środowiska oraz podstawowych technologii służących ochronie wody, gleby i powietrza.

Weryfikacja:

projekt, egzamin

**Powiązane charakterystyki kierunkowe:** IS\_W20, IS\_W11, IS\_W06, IS\_W07, IS\_W05, IS\_W04

**Powiązane charakterystyki obszarowe:**

### Profil ogólnoakademicki - umiejętności

**Charakterystyka U01:**

Potrafi przygotowywać wymagane raporty o oddziaływaniu na środowisko przedsięwzięć w zakresie gospodarki komunalnej, lub potrafi opracowywać wnioski i zna zasady wydawania decyzji administracyjnych w ochronie środowiska

Weryfikacja:

projekt, egzamin

**Powiązane charakterystyki kierunkowe:** IS\_U21, IS\_U20, IS\_U16, IS\_U15, IS\_U13, IS\_U12, IS\_U11, IS\_U03

**Powiązane charakterystyki obszarowe:**

### Profil ogólnoakademicki - kompetencje społeczne

**Charakterystyka K01:**

Ma świadomość wagi pozatechnicznych aspektów i skutków działalności inżynierskiej, w tym jej wpływu na środowisko i związanej z tym odpowiedzialności za podejmowane decyzje. Ma świadomość odpowiedzialności za wspólnie realizowane zadania związane z pracą zespołową. Rozumie potrzebę przekazywania społeczeństwu, m.in. poprzez środki masowego przekazu, informacji o osiągnięciach techniki i innych aspektach działalności inżynierskiej oraz potrafi przekazać takie informacje w sposób powszechnie zrozumiały

Weryfikacja:

projekt, egzamin

**Powiązane charakterystyki kierunkowe:** IS\_K06, IS\_K04, IS\_K03, IS\_K02, IS\_K01

**Powiązane charakterystyki obszarowe:**