



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Protection of Environment

### Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Machines

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

KNOWLEDGE: the student has basic knowledge about the construction of the surrounding world and the laws that govern it

SKILLS: the student is able to integrate the obtained information, interpret it, draw conclusions, formulate and justify opinions

SOCIAL COMPETENCES: the student is aware of the social and economic importance of environmental protection

### Course objective

To acquaint students with the basic concepts of environmental protection and threats environment



related to the operation of working machines, ways to minimize the negative environmental impact and methods of land reclamation in a situation where harmful substances are present get into the environment. Shaping pro-ecological attitudes among students.

### Course-related learning outcomes

#### Knowledge

Has knowledge of the principles of safety and ergonomics in the design and operation of machines and the threats that machines pose to the natural environment.

Has general knowledge of standardization, EU recommendations and directives, national, industry and international standards systems, and industrial standards.

Has extended knowledge of the standards for working machines in the field of methods of calculating and testing machines, safety, including road safety, environmental protection as well as mechanical and electrical interface.

#### Skills

He can estimate the potential threats to the environment and people from the designed working machine and vehicle from a selected group.

Can communicate on specialist topics with a diverse audience.

Can conduct a debate.

#### Social competences

He is ready to critically assess his knowledge and received content.

It is ready to fulfill social obligations, inspire and organize activities for the benefit of the social environment.

It is ready to initiate actions for the public interest.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The student is assessed for discussion and activity during lectures and exercises. Written passing the lectures. Mandatory individual exercise reports. Final credit exercise.

### Programme content

Environment and its protection - terminology, resources, state of emergency and institutions. Economic aspects environmental protection. The impact of industry on the atmosphere, water, soil and ways to reduce it this impact. Use of used machine parts. The impact of the sector maintenance and repair work for water and soil. The impact of agricultural mechanization on the environment.

### Teaching methods

1. Lectures with multimedia presentation.



2. Materials sent by the teacher in the form of pdf, video, presentation.
3. Development of the issues given by the Lecturer during the exercises and their presentation before group.
4. Calculation of pollution minimization tasks.

### Bibliography

#### Basic

1. Kłos Z., Feder S. (1994). Ochrona Środowiska w budowie maszyn roboczych i transporcie. Wydawnictwo Politechniki Poznańskiej.

#### Additional

1. Osuch, A., Rybacki, P., Osuch, E., Adamski, M., Buchwald, T., & Staszak, Ż. (2016). Ocena stanu jakości wód jeziora Łomno. Inżynieria Ekologiczna.
2. Osuch, A., Rybacki, P., Osuch, E., Buchwald, T., & Staszak, Z. (2015). Analiza porównawcza metod zagospodarowania zużytych opon rolniczych. Technika Rolnicza Ogrodnicza Leśna, (5).
3. Buchwald, T., Rzeźnik, C., Staszak, Ż., & Osuch, A. (2015). Sposoby zagospodarowania zużytych olejów eksploatacyjnych w zakładach serwisowych ciągników rolniczych. Nauka Przyroda Technologie, 9(4), 53.

### Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 50    | 2,0  |
| Classes requiring direct contact with the teacher  | 30    | 1,0  |
| Student's own work (literature studies, preparation for exercises, preparation of a report on the developed issues, preparation for written completion of exercises and lectures) <sup>1</sup> | 20    | 1,0  |

<sup>1</sup> delete or add other activities as appropriate