



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technological objects and devices in environmental engineering [S1IŚrod2>OiUT]

### Course

Field of study

Environmental Engineering

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

0

Laboratory classes

0

Other

0

Tutorials

30

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

1. Knowledge: water technology, wastewater technology, water supply, sewerage system, water management, waste management 2. Skills: acquired in the following subjects: water technology, wastewater technology, water supply, sewerage system, water management, waste management 3. Social competencies: awareness of constant updating and supplementing knowledge and skills, willingness to work in a group

### Course objective

The aim of the course is to broaden the knowledge and skills acquired on subjects: water and wastewater treatment technologies, water supply, sewerage system, water management, waste management, and to use in practice the knowledge and skills for the evaluation of technological solutions applied on visited objects. The performance of laboratory exercises along with the preparation of the presentation and report is also intended to help in the preparation of engineering work by paying attention to the elements of scientific research and their components, including literature review, data analysis, description of variants, presentation of results and drawing conclusions. Visits to various environmental engineering objects will allow students to familiarize themselves with the practical technical solutions and real operational problems.

### Course-related learning outcomes

#### Knowledge:

1. The student has basic knowledge of development trends in environmental engineering, including: water and wastewater treatment, water pipe networks and sewage systems, systems of waste management.
2. The student has basic knowledge of life cycle of devices, buildings and technical systems in environmental engineering, including: water and wastewater treatment, water pipe networks and sewage systems, systems of waste management.
3. The student knows basic methods, techniques, tools and materials applied to solve simple engineering tasks in environmental engineering.

#### Skills:

1. The student is able to perform preliminary economic and ecological analysis of technological solutions for the objects related to environmental engineering.
2. The student is able to critically analyse existing technical solutions in the field of environmental engineering, in particular devices, objects, systems, processes, services related to: water treatment and wastewater treatment, water supply and sewage systems, waste utilization and management.
3. The student can prepare a report and present it orally (multimedia presentation).
4. The student can draw conclusions.

#### Social competences:

1. The student is able to work in a group and sees individual responsibility in teamwork.
2. The student is aware of tracking trends and achievements in environmental engineering.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

In order TO COMPLETE THE COURSE, the student is obliged to:

- participate in classes, in particular in the field,
- prepare a written report of field activities with particular emphasis on the assigned task (task problem, to solve which the use of students knowledge, the literature and the information gained from field work is necessary),
- prepare and present oral presentation for all participants,
- pass the final test (minimum 50% of points).

The REPORT is made from each trip by the whole group, by indicating which persons are responsible for the implementation of specific tasks (details will be given during organizational classes). The report should contain a description of the technology and devices used in the visited object, contain technological analysis, indicate the advantages and disadvantages of the adopted solution and, if possible, tips to improve the functioning of the object. It should have a compact form and be written in the correct technical language. The report should include observations and conclusions as well as references to literature.

MULTIMEDIA PRESENTATION - it is prepared by the whole group and applies to each discussed trip. Each participant should appear at least once during the course in front of the group (with part of the selected presentation). Will be assessed: the form of presentation, used vocabulary, discussion of literature review, presentation of the object (technology, devices), conclusions.

TEST - at the end of the course there will be a selection test, which will contain questions about visited objects and technologies used on them (individual work)

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THE FINAL ASSESSMENT consists of:

40% - test (individual assessment)

30% - reports (joint assessments for the group)

30% - presentations (joint assessments for the group)

Final test grade:

up to 50% - insufficient

51-60% - sufficient

61-70% - a sufficient plus

71-80% - good

81-90% - a good plus

91-100% - very good

### Programme content

As part of the course, students will take a minimum of two study tours. The type of visited object will depend on the availability within the time of laboratory classes. Students are expected to familiarize themselves with the objects of environmental engineering, including:

- water intake and water treatment plants,
- sewage treatment plants,
- sewage pumping stations,
- sludge and / or waste utilization and management facilities,
- trenchless technologies
- etc.....

## Course topics

Class schedule:

1. Organizational classes including the presentation of proposals for visited objects, determining the requirements for passing the subject and discussing health and safety rules when visiting technical objects (2 hours)
2. Discussion of the technology used in the first visited object. Division into groups and assignment of tasks to be solved (3.5 hours)
3. Technical trip - facility 1 (8 hours)
4. Discussion of the technology used in the second object visited. Division into groups and assignment of tasks to be solved (3.5 hours)
5. Technical trip - facility 2 (8 hours)
6. Multimedia presentation of reports presenting the study of technological solutions used in visited facilities, discussion (4 hours)
7. Completion of the course - test of selection and submission of written reports (1 hour)

## Teaching methods

Course implemented in the form of a module. The number of trips may change, meetings with experts are also possible.

Multimedia presentations, case study, data analysis, variants analysis, discussion.

## Bibliography

Basic:

1. Literature from subjects: water technology, wastewater technology, water supply, sewerage system, water management, waste management
2. Detailed literature will be given before the beginning of the semester and adapted to the current state of knowledge

Additional:

1. Literature from subjects: water technology, wastewater technology, water supply, sewerage system, water management, waste management
2. Detailed literature will be given before the beginning of the semester and adapted to the current state of knowledge

## Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00