



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Water management

Course

Field of study

Environmental Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3 / 6

Profile of study

general academic

Course offered in

English

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

Tutorials

Projects/seminars

15

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

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Institute of Environmental Eng. and Building Installations

Faculty of Environmental Engineering and Energy

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Responsible for the course/lecturer:

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Prerequisites

1. Knowledge:

Fluid Mechanics, Water Supply, Sewerage, Water Technology and Wastewater Technology at basic level delivered earlier during First-cycle studies.

Environmental Chemistry and Environmental Biology: water chemistry, the processes of pollutants biodegradation at basic level delivered earlier during First-cycle studies.



2. Skills:

Application of knowledge of the above mentioned subjects. Acquiring knowledge from the literature, electronic resources and databases. The ability to self-education, the ability to conceptual thinking and reasoning.

3. Social competencies:

Awareness of the need to constantly update and supplement knowledge and skills.

Course objective

Acquisition of basic knowledge in the field of the sustainable and integrated water management and meteorology, with a particular focus on the balancing of water resources and demand for water, classification and methods for improving the water quality as well as the basics of the strategy in water management. Acquiring the ability to solve the complex problems related to the subject in an interdisciplinary perspective, with taking into account the existing organizational and legal conditions.

Course-related learning outcomes

Knowledge

1. The student has the basic knowledge in terms of water management, hydrology and meteorology suitable to formulate and solve simple problems of environmental engineering.
2. The student has the basic knowledge in terms of devices and technical systems in hydrology.
3. The student knows the basic methods techniques and tools applied to solve simple engineering tasks in water management, water protection, hydrology, meteorology.
4. The student has the basic knowledge necessary to understand social, economic, legal and other non-technical conditions of engineering activities, including the principles of sustainable development.

Skills

1. The student when formulating and solving engineering tasks in water management, can notice the systemic and non-technical aspects as well as the need to apply the principles of sustainable development.
2. The student is able to perform preliminary economic and ecological analysis of engineering activities concerning water management and hydrology (obtained at project).
3. The student is able to utilize appropriate methods, technologies and tools, can design and implement a simple system typical for water management and hydrology.
4. The student can cooperate and work in a team (obtained at the project classes)

Social competences

1. The student aware of non-technical aspects and effects of engineering activity, including its environmental impact, concerning water management and hydrology.



Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written examination (50% to pass the exam).

Written reports/exercices.

Project Preparation of the project (70%) and project defense - written and / or oral defense (30%).

Continuous assessment in the classroom.

Programme content

Circulation of water in nature. Hydrological cycle. Basic concepts, goals and tasks of water management. Ecological and social aspect of sustainable development of water management systems.

Hydrological systems. Conditions of water use in large catchments. Watercourses: stages of water and water discharges and probable flows, methods for determining the relationship: rainfall - runoff.

Resources of water. Water from rainfalls. Climatic deficit at precipitation. Spatial distribution of rainfalls and their regional deficit in Europe/Poland Structure of water consumption according to sources of resources and sectors of management.

Still water resources, natural and artificial retention of resources. Functions and tasks of retention.

Ground water resources - the disposal and exploitation resources. Quality evaluation criteria, classification of surface and ground water resources. Water needs. Classification of needs as a basis for dividing of water resources.

Water access indicators in Poland and other countries in Europe.

Flood and drought protection. Mitigation of water deficit consequences. Areas vulnerable to floods and water deficit.

Hydropower.

Development trends in the field of water management in industry (including energy), agriculture, and urban areas. Criteria for evaluation of water management systems. Renewal of water. BAT (Best Available Technologies) in the field of water management in large industrial plants.

Basic information in the field of meteorology: energy in the atmosphere, temperature, water in the atmosphere, meteorological observations, weather forecasting, the impact of human activities on the climate.

Teaching methods

Lectures: lectures with multimedia presentations and problem lectures.

Project: project method (practical project), case analysis.



Bibliography

Basic

Góra W., Mazurkiewicz K.: lectures notes as a printed Power Point presentation

The Water Framework Directive (WFD) 2000/60/EC

www.epa.gov

Additional

Ackerman S. A., Knox J. A. Meteorology, Understanding the atmosphere, wyd. Johns and Barlett Learning LLC, 2015

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	35	1,5
Student's own work (literature studies, preparation for exam, project preparation) ¹	115	4,5

¹ delete or add other activities as appropriate