# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of municipal engineering [S1BZ1E>PGK]

## Course

Field of study
Sustainable Building Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

## Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

## Number of credit points

1,00

## Coordinators

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## Lecturers

## Prerequisites

basic knowledge of mathematics, physics, chemistry, biology, fluid mechanics

## Course objective

Acquisition by the student of basic knowledge and skills in the field of municipal management (water treatment, sewage treatment, waste management)

## Course-related learning outcomes

Knowledge:
KSB_W01
have knowledge in the fields of mathematics, physics, chemistry, biology and other fields of sciencen suitable to formulate and solve problems concerning sustainable building engineering (civil engineering, environmental engineering and architecture). P6S_WG (O)
KSB_W19 have structured and theoretically based knowledge of key problems of heat technique,

technical thermodynamics, heat and mass exchange, fluid mechanics (including fluid-flow machines), environmental biology and environmental chemistry. P6S_WG (I)
KSB_W20 know basic methods, techniques, tools and materials applied to solve simple engineering tasks in the field of environmental engineering. P6S_WG (I)

Skills:
KSB_U01 are able to obtain information from literature, databases and other properly selected information sources; can integrate the obtained information, interpret and evaluate it, as well as draw conclusions, formulate, discuss and justify opinions. P6S_UW (O/I)
P6S_UK (O)
KSB_U02 are able to use advanced information and communication technologies (ICT) appropriate to perform typical engineering tasks. P6S_UW (O/I)
P6S_UK (O)
KSB_U05 can classify building facilities and elements of technical fitting of buildings. P6S_UW (O/I)
P6S_UK (O)
KSB_U07 are able to correctly utilise numerical, analytical, simulation, and experimental methods, to identify and solve problems in sustainable building engineering; to obtain and verify the results. P6S_UW (O/I)
P6S_UK (O)
KSB_U12 using appropriate methods, techniques and to tools, are able to design installations and devices typical for environmental engineering. P6S_UW (I)
P6S_UK (O)
KSB_U18 are able to critically analyse and evaluate the way of performance of a given technical solution in the field of environmental engineering. P6S_UW (I)
P6S_UK (O)
KSB_U19 can communicate in a foreign language (also other than English), including technical terminology in the field of sustainable building engineering. P6S_UK (O)
KSB_U23 can identify and specify simple practical engineering tasks, typical for environmental engineering. P6S_UW (I)
P6S_UK (O)
KSB_U26 are able to plan and organise work; both individual and team;
can cooperate with other people, are prepared to team work, also in interdisciplinary design teams (professionals of different sectors). P6S_UO (O/I)
P6S_UK (O)

Social competences:
KSB_K01 are able to adapt to new and changing circumstances, can define priorities for performing tasks defined by themselves and other people, acting in the public interest and with regard to the purposes of sustainable development. P6S_KK (O)
P6S_KO (O)
P6S_KR (O)
KSB_K02 take responsibility for the accuracy and reliability of working results and their interpretation. P6S_KK (O)
KSB_K03 are ready to autonomously complete and broaden knowledge in the field of modern processes and technologies of building engineering. P6S_KR (O)
KSB_K04 understand the need of team work, are responsible for the safety of their own work and team’s work. P6S_KO (O)
P6S_KR (O)
KSB_K05 can realise that it is necessary to improve professional and personal competence, understand the need and opportunities of continuous learning (Master and PhD studies, post-diploma studies, trainings). P6S_KR (O)
KSB_K06
are communicative in multimedia presentations. P6S_KO (O)
P6S_KR (O)
KSB_K07 understand the need to transfer to the society the knowledge about sustainable building engineering, transfers the knowledge in a clear and easily comprehensible manner. P6S_KO (O)
P6S_KR (O)
KSB_K08 are able to critically evaluate the results of their own work. P6S_KK (O)
KSB_K09 understand that it is necessary to protect the intellectual property and are ready to obey

the principles of professional ethics.P6S_KR (O)
KSB_K10 can realise how important is to take care of personal health and physical fitness. P7S_KR (O)

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lectures: written test (open and closed questions), report, presentation,
Lab; written reports on technical visits, presentation and activity in the classroom.

## Programme content

Lecture 1
Basic terminology, types and quality of water intake. Goals of water treatment, requirements for drinking water: WHO recommendations, EU Directives, national regulations 2h
Lecture 2
Processes and systems of treating ground and surface waters. The concept of using rainwater in sustainable construction. 2h
Lecture 3
Rainwater: treatment purposes, intake, technological processes in rainwater treatment. 2h
Lecture 4
Characteristics of wastewater, division of wastewater, role of wastewater treatment plants, preliminary wastewater treatment,
Lecture 5
Biological wastewater treatment, reuse of gray wastewater - water and sewage management in a sustainable building 2h
Lecture 6
Management of sewage sludge, modern treatment plant as a sewage treatment plant and recovery of water, energy, raw materials and bioproducts 2h
Lecture 7
Basics of waste management, types of waste, classification, basic methods of neutralization, recycling 3h
Laboratory 1
Technical visit to the Water Treatment Plant (WTP), 4h
Laboratory 2
Technical visit to the Waste Water Treatment Plant (WWTP), 4h
Laboratory 3
Technical visit at the Waste Processing Station (WPS), 4h
Laboratory 4
Summary of the visit to WTP. Discussion, student presentation, 1h
Laboratory 5
Summary of the visit to the WWTP. Discussion, student presentation, 1h
Laboratory 6
Summary of the visit to the WPS. Discussion, student presentation, 1h

## Course topics

none

## Teaching methods

Informative lecture (conventional)
Working with a book
Case study method
Demonstration method

## Bibliography

Basic
MWH, Water Treatment Principles and Design (Secondo Editio, Revised by J. C. Crittenden, R. R. Trussell, D. W. Hanol, K. J. Howe and G. Tchobanoglous), John Wiley & Sons, Inc., Hoboken, NY, 2005.

Metcalf and Eddy, Wastewater Engineering: Treatment and Reuse 4th Edition, McGraw Hill, 2003
Additional
Water treatment plant design, McGraw Hill, AWWA, 1990
AWWA, Technical Editor F. W. Pontius, Water Quality and Treatment, McGraw Hill, Inc, New York. 1990

## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 50 | 1,00 |
| Classes requiring direct contact with the teacher | 32 | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 18 | 0,00 |