



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

BIM in Environmental Engineering II

### Course

Field of study

Environmental Engineering Second-cycle Studies

Area of study (specialization)

Water Supply, Water and Soil Protection

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

30

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Filip Pawlak

Responsible for the course/lecturer:

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Faculty of Environmental Engineering and Energy

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### Prerequisites

1.Knowledge:

Knowledge of basic issues related do BIM (BIM process, model as a source of information about the building, integrated design).

Knowledge of selected issues from technical drawing (graphical presentation of sanitary installations in design projects).

Knowledge of selected issues related to the design of sanitary installations (basic principles of designing sanitary and HVAC installations).

2.Skills



Basic knowledge of BIM tools.

Ability to interpret the technical drawings of building and sanitary installations (plan, section, axonometric and detailed views).

Ability to apply the principles of designing sanitary installations and ability to interpret the results of calculations carried out with computer software.

3.Social competencies:

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

### Course objective

Gaining basic knowledge in carrying out a building procedure in the BIM process. Acquiring the ability to use building BIM model as the source of information about building. Gaining skills in participating integrated design process and multi-discipline cooperation.

### Course-related learning outcomes

Knowledge

1. Student has knowledge of the basic features of BIM process and required competences and responsibilities of its individual participants.
2. Student has knowledge of the basic standardization documents in BIM process.
3. Student knows possibilities and limitations related to the implementation of BIM in building process.

Skills

1. Student is able to create and edit an inter-branch information model of a building that meets the established BIM requirements (standards).
2. Student is able to get information from the model of building and use the model to exchange information with other participants in building process.
3. Student is able to carry out simple quantitative and qualitative analyzes based on the BIM model.

Social competences

1. Student understands the need of teamwork in solving theoretical and practical problems, in particular in complex design and execution processes in building.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Design exercises

The project is carried out in teams of several people. During the semester, progress of the project will be monitored (presentation, discussion). The final grade will be a weighted average from:



- project (drawings, descriptive part, statements, calculation results),
- written report about the BIM implementation
- activity in classes during whole semester.

### Programme content

Design exercises subject:

interbranch design of a building with particular emphasis on sanitary and HVAC installations, meeting given functional requirements and compliant with given BIM information requirements.

### Teaching methods

Design exercises: presentation of solutions for design issues, case studies, consultations of design team's work progress and identified problems, discussion.

### Bibliography

Basic

Polish Chamber of Civil Engineers, "Strategy of the Polish Chamber of Civil Engineers in the field of BIM implementation, the place and role of the Chamber in this process and indication of ways to implement this strategy", December 2019 - IN POLISH

Kaszniak D., "BIM in practice. Standards. Implementations. Case Study", Wydawnictwo Naukowe PWN, Warszawa 2017 - IN POLISH

Tomana, A., „BIM. Innovative technology in construction. Fundamentals”, 2015 - IN POLISH

Werner, W.A., Kacprzyk, Z. „Investment and construction procedures. Fundamentals of BIM”, Oficyna Wydawnicza POLCEN, Warszawa 2019 - IN POLISH.

Additional

Anger, A., Łaguna, P., Zamara, B., „BIM for managers”, Wydawnictwo Naukowe PWN SA, Warszawa 2021 - IN POLISH

Kacprzyk, Z., „Design in the BIM process”, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2020 - IN POLISH

Hardin, B., McCool, D., „BIM and Construction Management”, John Wiley&Sons Inc, 2000 - IN ENGLISH



### 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, project development in groups, preparation for the presentation of results, preparation of a BIM implementation report). <sup>1</sup>	20	1,0

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