COURSE DESCRIPTION CARD - SYLLABUS

Course name
BIM technology [S2Bud1E>TBIM2]

Course

Field of study
Civil Engineering

Year/Semester
1/2

Area of study (specialization)
Structural Engineering

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Student should have: – passed BIM Technology sem.1 course; – the ability to model basic objects in a BIM environment; – knowledge of the principles of preparing technical documentation; – language skills (English) at a minimum B2 level.

Course objective

Developing the ability to apply BIM in practice to projects of moderate complexity and to work in an interdisciplinary collaborative environment.

Course-related learning outcomes

Knowledge
Student:
– has in-depth knowledge of BIM technologies and their application in the investment process;
– knows the principles of design, implementation, and operation of facilities in the context of their life cycle;
– knows the standards and legal regulations related to design and technical documentation.

Skills

Student:
– is able to develop a building design and prepare technical documentation in a BIM environment;
– is able to use specialized IT tools supporting the design and organizational process;
– is able to collaborate in a design team and integrate information from various sources;
– is able to communicate the results of design work in a professional manner.

Social competences
Student:
– is responsible for the reliability of the developed model and design data;
– is willing to develop competencies in the field of modern technologies in construction;
– understands the need to comply with the principles of professional ethics and intellectual property protection.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture – written test, preparation of required documents. When assessing learning outcomes, the grading scale and the allocation of marks to percentage bands set out in the Study Regulations apply.

Laboratory – activity and progress in class, completion of a team/individual project – BIM model of a multi-family building. When assessing learning outcomes, the grading scale and the allocation of marks to percentage bands set out in the Study Regulations apply.

Programme content

BIM in the design and implementation process; BIM workflows; coordination of interdisciplinary models; responsibility for data and information quality; integration of BIM with administrative procedures; modelling of objects of medium complexity; generating technical documentation from the model; verifying the correctness of the model.

Course topics

– Lectures
• The role of BIM in the investment process
• BIM workflows at the design stage
• BIM in the investment implementation phase
• Interdisciplinary cooperation in the BIM environment
• Coordination of industry models
• Responsibility for data and information quality
• Integration of BIM with administrative procedures
• BIM and design decisions
• Change management in the model
• Examples of BIM implementations in residential construction
• Legal and organisational aspects of teamwork
• Common mistakes in modelling and coordination

– Laboratories
• BIM project organisation for multi-family buildings
• Multi-family building modelling
• Collision and incompatibility detection
• Material and surface specifications
• Technical drawing generation
• Update and change control
• Data accuracy verification
• Model preparation for presentation
• Project presentation

Teaching methods

• Problem-based lecture with multimedia presentation

• Demonstration of work in a BIM environment
• Design exercises in the laboratory
• Case studies
• Discussion and student presentations

Bibliography

Basic
1. Eastman, C. et al. (2018). BIM Handbook. Wiley.
2. Borrmann A., Koenig M., Koch C., Beetz J., 2018, Building Infor¬mation Modeling: Technology foundations and industry prac¬tice. Springer.
3. ISO 19650 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM).
4. EN 17412:2020, BIM – Level of Information Need

Additional
1. Hardin, B., McCool, D. (2015). BIM and Construction Management. Wiley.
2. Succar, B. (2015). BIM Framework and Maturity Models.
3. Smith, P. (2014). BIM Implementation – Global Strategies.
4. buildingSMART International. IFC Specification Documentation.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	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)	30	1,00