



SZKOŁA GŁÓWNA  
GOSPODARSTWA  
WIEJSKIEGO

## Basics of BIM (Building information Modeling)

### Educational subject description sheet

#### Basic information

<b>Field of study</b> Course Offer for exchange students - second cycle studies, including uniform master studies (MA programmes) <b>Speciality</b> - <b>Organizational unit</b> Course Offer for exchange students <b>Study level</b> second cycle studies, including uniform master studies (MA programmes) <b>Study form</b> full-time studies <b>Education profile</b> General academic		<b>Didactic cycle</b> 2024/25 <b>Subject code</b> PWMPWM2S_D.B100000P.06438.24 <b>Lecture languages</b> english <b>Mandatory</b> Elective subjects <b>Block</b> Basic subjects <b>Disciplines</b>
<b>Coordinator</b>	Wiesław Ptach	
<b>Teacher</b>	Wiesław Ptach	
<b>Period</b> Winter semester	<b>Examination</b> Pass with grade  <b>Activities and hours</b> Lecture: 30	<b>Number of ECTS points</b> 4

#### Goals

Code	Goal
C1	To familiarize students with modern techniques of computer modeling of building information.

## Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
<b>Knowledge - Student knows and understands:</b>			
W1	development trends in the processes of designing building structures in environmental engineering; knows BIM terminology		Test (written or computer based)
W2	issues in the field of BIM as a method of modeling building structures and modern methods of teamwork and communication		Test (written or computer based)
<b>Skills - Student can:</b>			
U1	assess the benefits of implementing the BIM method in the life cycle of a building.		Project
U2	use modern design support computer programs.		Project
<b>Social competences - Student is ready to:</b>			
K1	formulating opinions on technical and technological processes taken into account in design		Presentation
K2	teamwork and assessment of the impact of proper data exchange, communication and cooperation between the parties to the construction project on the effectiveness of the project		Project, Presentation

## Study content

No.	Course content	Subject's learning outcomes	Activities
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1.	<p>Information and communication management in the life cycle of a construction project (Project Lifecycle Management – PLM). Modern methods of teamwork. The concept of Integrated Project Delivery (IPD), the importance of inter-industry cooperation and coordination in a construction project. Electronic documentation in the life cycle of a building. Introduction to the Building Information Modeling (BIM) method, origins - from CAD to BIM, basic terminology, parametric and direct modeling techniques. BIM as an object model and as a process in the context of PLM. 3D – 10D BIM models. BIM in the world and in Poland. BIM standards in selected countries. BIM in public procurement. BIM model development procedure. Objects, families of objects, classification of objects, constraints, relations, parameters. Modification of object features. LOD levels. The issue of interoperability, data exchange in the BIM model, software interoperability. OmniClass building element classification systems. Open standards, data exchange formats. An overview of software tools and functionalities used in BIM projects. Planning a construction project and managing the course of works according to the BIM method - scheduling. The economic context of BIM, the cost dimension of the BIM model, BIM class costing tools. BIM and augmented reality (VR) in the facility lifecycle. BIM and building operation management. The content of the exercises is an introduction and preparation of the student to use software supporting design in BIM technology in the process of modeling a building object. The project includes a coherent teaching concept of subjects using BIM technology (General Construction, Foundations, Sanitary installations).</p>	W1, W2, U1, U2, K1, K2	Lecture
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### Course advanced

Activities	Methods of conducting classes
Lecture	Lecture, Design method, Individual work

Activities	Examination method	Percentage
Lecture	Test (written or computer based)	25%
Lecture	Project	60%
Lecture	Presentation	15%

Activities	Credit conditions
Lecture	Passing the lecture material (25%), assessment of the completion of the design task (60%) assessment of the defense of solutions to the design task (15%)

## Literature

### Obligatory

1. Sacks R., Eastman Ch., Lee G., Teicholz P. "BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers". 2018. John Wiley&Sons inc.
2. Hardin B., McCoool D. "BIM and Construction Management". John Wiley&Sons inc.
3. Sacks R., Korb S., Barak R. "Building Lean, Building BIM". Taylor&Francis Ltd.

### Optional

1. Barnes P. "BIM for Project Managers: Digital Construction Management". Ice Publishing
2. Landscape Institute. "BIM for Landscape". Taylor&Francis Ltd.
3. Holzer D. "The BIM Manager's Handbook". John Wiley&Sons Inc.
4. Teicholz P. "BIM for Facility Managers". John Wiley&Sons Inc.
5. Eynon J. "Construction Manager's BIM Handbook". John Wiley&Sons Inc.

## Calculation of ECTS points

Activity form	Activity hours*
Lecture	30
Preparation for exercises	15
Preparing the project	60
Preparation for the exam	10
Preparation of a multimedia presentation	5
<b>Student workload</b>	<b>Hours</b> 120
<b>Number of ECTS points</b>	<b>ECTS</b> 4

\* hour means 45 minutes