SYLLABUS

Name: ***BIM Basics (BudAB>SI8BIMBAS19)***
Name in Polish: **Podstawy BIM**
Name in English: ***BIM Basics***

Information on course:

Course offered by department: Faculty of Civil Engineering
Course for department: Faculty of Civil Engineering

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://teams.microsoft.com/l/team/19%3aXmXHaFMG5NIRpIyAy5qxChcSwf0w6H0PQCvdz39MO5o1%40thread.tacv2/conversations?groupId=4f1b75ed-7aa4-454c-9974-d4939b5c780f&tenantId=ab840be7-206b-432c-bd22-4c20fdc1b261

Short description:

Introduction to BIM methodology, familiarization with the basic concepts and technologies of BIM. Showing the fundamental differences between traditional CAD technology and BIM technology. Discuss the impact of BIM on engineering practice, build-it-twice principle. Provide basic knowledge of computer science to understand BIM basics. BIM as a modern business process based on the concept of the Lean / Agile process and as an Integrated Project Delivery. BIM for the investor, designer, contractor, manager, producer, official.

Description:

LECTURE: 15 hours
Limitations of traditional construction. Industry digitization and the role of BIM. Construction 4.0. The CAD-BIM evolution. Basic definitions. Introduction. Maturity levels. World and Poland. CAD-BIM comparison. Benefits of BIM. Creating an object-oriented BIM model. 3D mapping. Information carrier. Multidimensionality. LOD / LOI. Data standards and formats. Interoperability. Open BIM. Standardization. IFC. IDM. IFD. BCF. COBie. Classifications. Information and management processes. Contract documents. Roles of people. EIR. BEP. CDE. Related issues. Lean. IPD. Life cycles. Asset Management. Facility Management. Related technologies. VR +. VDC. Graphic programming. Generative design. Artificial intelligence. Digital twins. SHM monitoring. GIS. 3D reconstruction. UAV. Automation and robotization. 3D printing. BIM in the facility's lifecycle. Projects. Building. Maintenance. BIM for stakeholders. Investor. Designer. The Contractor. Supervision. Manager. Manufacturer. Official. Implementation strategies. The digitization of the procurement market. Copyright. Initiatives. Expectations. Education. Pilotages.

LABORATORIUM: 15 hours
Modeling simple objects in 3D space, model line and detail line. Modeling of elements of a single-family residential building. Basic model elements: beams, columns, ceilings, walls, foundations and roofs. Additional elements of the model: stairs, doors and windows, handrails, finishing elements and terrain. Extract of data from a single-family residential building model: drawing sheets, dimension lines, bill of materials. Model for numerical analyzes, IFC model. Selected aspects of creating families: the idea of families in the Revit environment, definition of a parameterized beam model. Advanced problems of creating families: nested families, inherited parameters, ties. Basics of Dynamo graphical programming: basic mathematical rules and geometry support from the level of graphical code. Team work on BIM models. Central model, local models, data synchronization, information exchange and collisions. Extensions and plugins in the Revit environment, API. C # text programming: functional programming, object-oriented programming.

Bibliography:

[1] Kasznia D., Magiera M., BIM w praktyce. Standardy Wdrożenie Case Study, PWN, 2021
[2] Salamak M., BIM w cyklu życia mostów, PWN, 2018
[3] Tomana A., BIM. Innowacyjna technologia w budownictwie, Builder, 2016
[4] Eastman C., Teicholz P., Sacks R., Liston K., BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors, John Wiley & Sons, 2018
[5] Jackson P., Construction Manager's BIM Handbook, Wiley Online Library, 2018

Learning outcomes:

KNOLEDGE
(1) Knows and understand: basics of architectural design, basics of descriptive geometry and technical drawing regarding writing and reading of architectural, construction and geodetic drawings, as well as their preparation using CAD and BIM technology - [learning outcome K1A_W02].
(2) Knows and understand theoretical models of materials and principles of modelling and analysis of bar structures in the field of statics, dynamics and stability, and knows selected software supporting design, also with the use of BIM technology - [learning outcome K1A_W04].

SKILLS
(3) Can: read architectural, construction and geodetic drawings and prepare graphic documentation in the environment of selected CAD and BIM software - [learning outcome K1A_U07].

Assessment methods and assessment criteria:

PREREQUISITES: No requirements

CONDITIONS FOR PASSING THE SUBJECT
1) Attendance at classes (may be monitored).
2) Test of knowledge acquired during lectures (weight 40%)
3) Completion and presentation of the project during the laboratory (weight 60%).

FINAL RATING 100%

To have partial grades transferred, students should contact the instructor within the first two weeks of the semester.

The syllabus is effective from the summer semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Element of course groups in various terms:

Course group description	First term	Last term
missing group description in English (BudAB-S1-2019-sem8)	2022/2023-L	

Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	1	2022/2023-L	