COURSE DESCRIPTION CARD - SYLLABUS

Course name
BIM Technology

Course

Field of study
Civil Engineering

Year/Semester
2/2

Area of study (specialization)
Structural Engineering

Profile of study
general academic

Level of study
Second-cycle studies

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

2

Lecturers

Responsible for the course/lecturer:
dr hab. inż. Adam Glema, prof. PP

adam.glema@put.poznan.pl

tel. 616652104

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 5 Poznań

Responsible for the course/lecturer:
dr inż. Monika Siewczyńska

monika.siewczynska@put.poznan.pl

tel. 616652864

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 5 Poznań

Prerequisites

A student starting this subject should have a basic knowledge of construction, in particular:

- know the principles of BIM modelling and IFC file export

- be able to formulate and analyse components of investment processes,

- take care of the necessity to improve professional and personal competences, use tools and with their help solve problems in designing, execution and maintenance of construction objects.

Course objective

Application of technology and digitisation of data flow in interdisciplinary cooperation during investment task processes.

Course-related learning outcomes

Knowledge

Students know

- digital measurement methods used in execution, inventory, diagnostic and control works applicable in the construction investment process

- processes occurring in the full life cycle of construction objects and the principles of their management, and also knows and understands the need for systematic assessment and maintenance of their technical condition

Skills

The student is able to:

- can prepare technical documentation in the environment of selected CAD software, including those using BIM technology

- can obtain information from databases and other properly selected sources; can integrate obtained information, evaluate it, draw conclusions, formulate and justify opinions and present them

Social competences

The student:

- is responsible for the reliability of the obtained results of his/her work and the work of the team subordinated to him/her

- complements his/her knowledge by applying modern technologies and digitalisation in the construction industry

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - written test.

Laboratory - assessment of inventory exercises and processing of point cloud and other BIM construction data. Evaluation of model presentation.

Programme content

Lectures:

- BIM Building Data Modelling for Civil Engineering and for Road, Rail, Bridge , Inland, Marine and Aviation Infrastructure.

- Cycle of BIM stages from concept, design, construction, operation, facility management.

Lectures:

- BIM Building Data Modelling for Civil Engineering and for Road, Rail, Bridge , Inland, Marine and Aviation Infrastructure.

- The cycle of BIM stages from conception, design, construction, operation, facility management.

- BIM stakeholders. Industry collaboration, collaboration with geoinformaticians, spatial information systems.

- Proceedings with the application of electronic-mobile functioning of architectural and construction administration.

Laboratories:

independently or in cooperation in 2-person teams (Revit, Recap, 3D Zephyr, Archicad,):

- preparation of design documentation of models made in sem. 1

- photogrammetry and modelling of a fragment of a building façade

- 3D scanning and modelling of a building fragment

- interoperability of data to be used in analysis, quotation, costing, production of elements, property management

- presentation of models

Teaching methods

Lectures - informative lecture with multimedia presentation.

Laboratories: multimedia presentation illustrated with examples and performance of tasks given by the instructor, solving individual or team tasks and elearning with instruction.

Bibliography

Basic

https://core.ac.uk/download/pdf/19730268.pdf

Klaus HANKE & Pierre GRUSSENMEYER , ARCHITECTURAL PHOTOGRAMMETRY: Basic theory, Procedures, Tools, https://www.isprs.org/commission5/tutorial02/gruss/tut_gruss.pdf

Fabrizio Banfi, Mattia Previtali, Human–Computer Interaction Based on Scan-to-BIM Models, Digital Photogrammetry, Visual Programming Language and eXtended Reality (XR), applsci-11-06109-v2.pdf

Additional

• Richard Garber (Editor) Closing the Gap: Information Models in Contemporary Design Practice Architectural Design, Wiley, (2009).

• Richard Garber, BIM Design: Realising the Creative Potential of Building Information Modelling Wiley, (2014).

• Karen Kensek, Building Information Modeling Series: Pocket Architecture, Routledge, (2014).

• Karen Kensek, Douglas Noble, Building Information Modeling: BIM in Current and Future Prac-tice, Wiley, (2014).

• Brad Hardin, Dave McCool, BIM and Construction Management: Proven Tools, Methods, and Workflows, 2nd Edition, Wiley, (2015).

• Andre Borrmann, Markus König, Christian Koch, Jakob Beetz, Building Information Modeling. Technologische Grundlagen und industrielle Praxis, VDI, Springer, Wiesbaden, (2015).

• Stefan Mordue, Paul Swaddle, David Philp, Building Information Modeling For Dummies, Wiley, (2015).

• Government Construction Strategy, Cabinet Office, London, (2011).

• Digital Built Britain, Level 3 Building Information Modeling - Strategic Plan, UK Government. (2015). https://doi.org/URN BIS/15/155.

• Centre for Digital Built Britain at University of Cambridge, (2019). https://www.cdbb.cam.ac.uk/

• NIBS, National BIM Guide for Owners, NIBS. (2017).

• EUBIM Task Group, Handbook for the introduction of Building Information Modelling by the European Public Sector, EUBIM Task Group. (2016).

• AIA, Integrated Project Delivery: A Guide, American Institute of Architects. (2007). https://doi.org/10.1016/j.autcon.2010.09.002. https://www.aiacontracts.org/resources/64146-integrated-project-delivery-a-guide

• ISO 16739:2013. Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries, (2013).

• IFC4 Document, (2016). http://www.buildingsmart-tech.org/ifc/IFC4/Add2/html/

• ISO 29481-1:2016 Building information models -- Information delivery manual Part 1: Methodology and format, (2016).

• BuildingSMART, (2019). https://www.buildingsmart.org/ .2

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Students' own work (literature studies, preparation for laboratory classes, preparation for the colloquium, performing laboratory exercises and presentations) [1]	30	1,0

[1] delete or add other activities as appropriate