STUDY MODULE DESCRIPTION FORM

Name of the module/subject **BIM Technology**		Code **1010112131010117823**

Field of study **Civil Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 3**

Elective path/specialty **-**	Subject offered in: **English**	Course (compulsory, elective) **obligatory**

Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**

No. of hours Lecture: **30** Classes: **15** Laboratory: **-** Project/seminars: **-**	No. of credits **4**

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art **technical sciences** **Technical sciences**	ECTS distribution (number and %**)** **4 100%** **4 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	knows principles of design, construction and operation of construction structures
2	**Skills**	can formulate and analyze elements of constructional investment use tools and solve problems on design and construction in civil engineering
3	**Social competencies**	is aware of the necessity to advance professional and personal competencies

Assumptions and objectives of the course:

Introduction to technology of digitalization of data flow in construction industry
and its application in multidisciplinary collaboration within construction investment project.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. has knowledge about advances in effectiveness, costs and time of construction projects realization - [[K_W10]]

2. has knowledge on data flow for management in the full life cycle of buildings - [[K_W19]]

3. knows standards for building information modeling - [[K_W14]]

Skills:

1. makes use of dedicated tools to find useful information communicate and offer computer aided design and management - [[K_U05]]

2. can select analytical or numerical tools to solve technical problems - [[K_U13]]

3. can define a computer model and carry out analysis of buildings - [[K_U06]]

Social competencies:

1. recognizes individual and team work of a problem and team management - [[K_K01]]

2. complements knowledge of modern technologies in civil engineering - [[K_K03]]

Assessment methods of study outcomes

Results of excercises for creation of building information model, application of viewers for model and its data information operations. elaboration of model in open standard IFC

Course description
Introduction to Building Information Technology, history, definition. For whom BIM ? Owner, Owner Representative, Operator and Facility Manager, Facility End-User, Designer, Construction Contractor, Subcontractors, Specialist suppliers, Manufactures of construction materials and products. BIM in life-cycle stages of building. Data flow. Interoperability. openBIM. BuildingSmart. Open data model requirements. BIM implementation in the world. BIM levels 0-3. LOD Level of Detail. Level of Development. BIM standards. Industry Foundation Classes. Legal regulations in Poland. ISO, EN, PN. BIM case study for good practices. Formulation of BIM requirements. BIM Execution Plan. Roles and specializations in BIM.. BIM Manager and his responsibilities. Skills and experience in BIM. Competence criteria. Roles and specializations in BIM. Professional qualifications certification. BIM software. BIM model viewers. BIM software certification by BuildingSmart organisation. Examples of certificates and performance tests for import and export of IFC data. Visualization, laser scanning. BIM efficiency factors . Change of costs distribution for BIM workflow. BIM implementation in design company.

Basic bibliography:

1. Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors 2nd Edition, Wiley, 2011 ISBN: 978-0-470-54137-1, (648 pages)

2. Karen Kensek, Douglas Noble Building Information Modeling: BIM in Current and Future Practice Wiley, 2014 ISBN: 978-1-118-76630-9, (432 pages)

3. Andrzeja Tomana BIM. Innowacyjna technologia w budownictwie. Podstawy technologii BIM, standardy i narzędzia oraz przykłady zastosowań w polskich firmach. BIMklaster, Kraków, 2015 ISBN: 978-83-943060-0-7, (294 str.)

Additional bibliography:

1. http://buildingsmart.org

Result of average student's workload	
Activity	**Time (working hours)**
Student's workload	

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	50	2
Practical activities	50	2