



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction project management

### Course

Field of study

Year/Semester

Civil Engineering

1/1

Area of study (specialization)

Profile of study

Construction Engineering and Management

general academic

Level of study

Course offered in

Second-cycle studies

Polish

Form of study

Requirements

full-time

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

0

0

Tutorials

Projects/seminars

0

30

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

dr inż. Tomasz Wiatr

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### Prerequisites

**KNOWLEDGE:** Knowledge of the key subjects included in the standard of education of a civil engineer at first-cycle studies within the chosen specialization of studies.

**SKILLS:** Designing of simpler building structures as part of the specialization of the profession of civil engineer, taking into account the needs of operation and maintenance.

**SOCIAL COMPETENCES:** Openness to cooperation and team respect for the effects of creative design work of engineers in a construction investment project.



## Course objective

Co-creation of professional qualifications of general construction civil engineers as main designers and managers. Familiarization with the international guidelines of competence in project management as a form of integration of engineering knowledge in a managerial context. The integration of knowledge about designing and constructing, also in the context of Open BIM, and planning a construction project, as the basis for organizing, motivating and monitoring, especially with the use of computer-aided schedules, is of particular importance.

## Course-related learning outcomes

### Knowledge

1. Getting to know the project management knowledge areas according to ISO, PMI and IPMA and their connection with other construction knowledge in the field of construction investment projects.
2. Knowledge of the basic formal and legal procedures of the construction investment process, including the public procurement law and the content of the construction tender documentation.
3. Knowledge of project management software (PMS), including BIM class software (3D PMS) in the field of key analytical methods in terms of construction needs.

### Skills

1. Typology of undertakings in various procurement, delivery and financing systems and identification of key problems and risk factors in the relationship between the parties to the construction contract.
2. Ability to develop a project plan, including the material and financial schedule and derivative analyzes (histogram/cyclogram/esogram) as part of the investment task.
3. Team work with the Open BIM context, including collaboration and data exchange in terms of international open standards and national management standards.

### Social competences

1. Teamwork competences - a sense of a common goal, the role of communication and motivation.
2. A holistic view of the project from the recipient's point of view - user/ordering party/investor.
3. Understanding design as a conceptual preparation of activities and a key form of planning.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The basis for passing the lecture is a written test with up to 10 issues (short tasks such as describe or calculate) with more than half of the correct answers, and the basis for passing the exercises is to solve a medium complex problem in the field of organization of a construction project using design methods.

## Programme content

With a key division into lecture (knowledge review, methods, programs and examples) and auditorium exercises (team project work, project planning and schedule analysis). Review of project management knowledge areas according to IPMA ICB/PMI PMBOK, taking into account the specificity of the construction investment process and the standards ISO series. Review of procurement, delivery, financing and payment systems for investment projects in construction. Formal and legal procedures, construction design documentation, tender and execution documentation (design as project planning)



in terms of Polish law, including public procurement law. Construction project management in terms of PMS and 3D PMS class software. As part of the exercise, project planning using network schedule and critical path method in PMS system and teamwork design with aid of BIM models data in CDE cloud.

### Teaching methods

1. Lecture: presentations with the use of slides, oral explanations and sketches on the blackboard.
2. Tutorials: planning a project using computer-aided design methods.

### Bibliography

#### Basic

1. Kacprzyk Z., Projektowanie w procesie BIM. Oficyna Wydawnicza PW, Warszawa 2020.
2. Kosecki A., Kontraktowanie realizacji przedsięwzięć budowlanych. AGH, Warszawa 2015.
3. Pawlak M., Zarządzanie projektami. PWN, Warszawa 2006.
4. Praca zbiorowa. Podręcznik dla inwestorów przedsięwzięć infrastrukturalnych. MRR, Warszawa 2010.
5. Stockes E., Akram S., Zarządzanie przedsięwzięciami budowlanymi. Biblioteka menedżerów budowlanych. Poltext, Warszawa 2010.
6. Strzelecka E., Glinkowska B., Maciejewska M., Wiażel-Sasin B., Zarządzanie przedsięwzięciami budowlanymi w gospodarce polskiej: podstawy, procedury, przykłady. Wydawnictwo PŁ, Łódź 2014.
7. Wiatr, T. Zarządzanie przedsięwzięciami – wchłanianie wiedzy i doświadczeń. Konferencja Project Management, Profesjonalizm. Stowarzyszenie Project Management Polska, Jelenia Góra 2000.

#### Additional

1. Baldwin M., The BIM-Manager: A Practical Guide for BIM Project Management. Beuth, 2019.
2. Buttelwerth J., Phoenix - Real World Scheduling. John Wyatt Publishing & [www.phoenixcpm.com](http://www.phoenixcpm.com)
3. Halphin W. H., Construction Management. Wiley, 2006.
4. Hendrickson C., Project Management for Construction. Fundamentals Concepts for Owners, Engineers, Architects and Builders. Carnegie Mellon University, Pittsburgh 2008.
5. O'Brien J., Plotnick F., CPM in Construction Management. 6th Edition. McGraw-Hill, 2006.
6. Winch G. M., Managing Construction Projects. Blackwell Publishing, 2002.



### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,0
Classes requiring direct contact with the teacher	60	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate