



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction engineering and management [N2Bud1-BDMiK>IPB]

Course

Field of study

Civil Engineering

Year/Semester

2/3

Area of study (specialization)

Road, Bridge and Railway Engineering

Profile of study

general academic

Level of study

second-cycle

Course offered in

polish

Form of study

part-time

Requirements

elective

Number of hours

Lecture

10

Laboratory classes

0

Other (e.g. online)

0

Tutorials

10

Projects/seminars

0

Number of credit points

2,00

Coordinators

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Lecturers

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

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 execution, including preinvestment analysis and studies. Planning of construction project, as the basis for organizing, motivating and monitoring, especially with the use of computer-aided schedules.

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 software and key analytical methods in terms of linear type projects in communication construction.
4. Knowledge in detail the rules of developing the procedures of construction project quality management; have knowledge of the effectiveness, costs and timing of construction projects under risk and uncertainty conditions.
5. Detailed knowledge on business activity in construction industry and the ways of developing different forms of individual entrepreneurship; understand the principles of enterprise financial economy.

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 project and estimate documentation and analyzes of the feasibility and effectiveness of investments in the context of national 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.
4. Student are ready to think and act in a business-like way.

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. Review of procurement, delivery, financing and payment systems for investment projects in construction. Formal and legal procedures, design documentation, tender and as-built documentation (design as project planning) in terms of Polish law, including public procurement law. Project management in terms of PMS and 3D PMS computer systems. Project management in terms of PMS class software systems, taking into account the specificity of linear facilities. Planning the project by the method of schedules and cyclograms with the use of a computer software.

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. Chyliński P., Planista Plus. Program do planowania prac liniowych i kubaturowych. Wrocław 2008.
2. Kosecki A., Kontraktowanie realizacji przedsięwzięć budowlanych. AGH, Warszawa 2009.
3. Pawlak M., Zarządzanie projektami. PWN, Warszawa 2006.
4. Praca zbiorowa. Podręcznik dla inwestorów przedsięwzięć infrastrukturalnych. MRR, Warszawa 2010.
5. Praca zbiorowa. Drogi i mosty – poradnik praktyka, projektowanie, finansowanie, przetargi, zarządzanie. Verlag Dasfhofer, Warszawa 2013.
6. Strzelecka E., Glinkowska B., Maciejewska M., Wiażel-Sasin B., Zarządzanie przedsięwzięciami budowlanymi w gospodarce polskiej: podstawy, procedury, przykłady. WPL, Łódź 2014.

Additional

1. Baldwin M., The BIM-Manager: A Practical Guide for BIM Project Management. Beuth, 2019.
2. Eastman C., Teicholz P., Sacks R., Liston K., BIM Handbook. A Guide to Building Information Modelling for Owners, Managers, Designers, Engineers and Contractors. Wiley, 2011.
3. Halpin 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	50	2,00
Classes requiring direct contact with the teacher	20	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00