COURSE DESCRIPTION CARD - SYLLABUS

Course name
Flexibility in Engineering design

Course

Field of study
Civil Engineering

Year/Semester
1/1

Area of study (specialization)
Construction Engineering and Management

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
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

The student has basic knowledge of the basics of construction; The student is able to obtain information from the indicated sources and analyze engineering activities undertaken; The student is aware of the need to constantly update and supplement construction knowledge and take responsibility in professional work; The student is aware of the existence of information issues in construction and optimization problems of process planning

Course objective

Learning and expanding knowledge of the basic principles of flexible construction in the aspect of implementation of a construction project.

Increasing student awareness in the field of designing building objects in terms of optimization not only of production costs (building the building) but also the use of the building in later years and the possibilities of expansion, adaptation, change of purpose.

Course-related learning outcomes

Knowledge

Have extended and detailed knowledge of material strength, modelling and constructing;have knowledge of theoretical principles of the finite element method as well as general rules of non-linear calculations of engineering structures.

Have detailed knowledge in the field of operation algorithms of selected software supporting the analysis and design of building facilities, which are also useful to plan and manage construction projects, including Building Information Modelling (BIM).

Know 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.

Skills

Have structured and theoretically based knowledge of the processes in the full life cycle of building structures and their management rules. They also know and understand the need for systematic evaluation and maintenance of structure technical condition.

Ae able to prepare an introductory economic analysis of proposed solutions and undertaken engineering activities; can prepare a cost calculation and a work schedule, contract and business plan of a building project; are able to manage building processes, define duties and tasks in investment and building control.

Can estimate hazards of building projects and building operation, implement suitable safety rules and prepare work standards as well as quality management procedures. .

Social competences

Participate in cultural events of a town, city region and country and uphold the history and traditions of local communities.

Understand the need to transfer to the society the knowledge about building engineering, transfer the knowledge in a clear and easily comprehensible manner.

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:

As a form of measuring / assessing student work, a final test is carried out (during the last class)

Grade scale determined% from:

90 very good (A)

85 good plus (B)

75 good (C)

65 sufficient plus (D)

55 satisfactory (E)

below 54 insufficient (F)

Programme content

Lecture 1 - Introduction,

Lecture 2 - Introduction to flexibility in construction

Lecture 3 - Flexibility and practice in construction

Lecture 4 - Examples of flexibility

Lecture 5 - Credit

Exercises 1 - Introduction

Exercises 2 - A flexible approach to the construction process.

Exercises 3 - Examples of the use of flexibility in construction in the world.

Exercises 4 - NPV problem

Exercises 5 - Decision tree

Exercises 6 - Group decision making

Exercises 7 - Practical task

Exercises 8 - Credit

Teaching methods

Pyramid discussion; Panel discussion; The classic problem method; Teaching games; Exchange of ideas; Informative lecture; Problem lecture; Conversational lecture; Program text; Work with a book; Talk; Lecture reading; Demonstration method; Production exercise method; Method of experiments; Observation and measurement method; Project method; Leading text method; Workshop method; Show.

Bibliography

Basic

1. Flexibility in Engineering Design, Richard De Neufville, Stefan Scholtes

2. Applied Systems Analysis: Engineering Planning and Technology Management, Richard De Neufville

Additional

1. Systems Analysis for Engineers and Managers, Richard De Neufville

2. Engineering Design: A Systematic Approach, Gerhard Pahl,W. Beitz,Jörg Feldhusen,Karl-Heinrich Grote

3. Project Management Institute, A Guide to the Project Management Body of Knowledge (PMBOK Guide), Fifth Edition.

4. Airport Systems: Planning, Design, and Management, Richard De Neufville, Amedeo Odoni

Breakdown of average student's workload

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

[1] delete or add other activities as appropriate