



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Theory of decision making [S2Bud1-IPB>TPD]

### 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

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

15

### Number of credit points

3,00

### Coordinators

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### Lecturers

### Prerequisites

Basic knowledge of the organization of construction production and construction economics Elementary knowledge of the theory of probability

### Course objective

Transfer of knowledge in the field of decision theory and the application of its selected elements in issues of the investment process. Acquisition of basic skills in the analysis of phenomena, factors affecting them, building formal and descriptive models and solving these models

### Course-related learning outcomes

Knowledge:

- has in-depth knowledge of the algorithms for the operation of selected computer programs supporting the analysis and design of building structures and useful for planning and managing construction projects, including BIM (Building Information Modeling) technology
- knows the principles of creating quality management procedures for construction projects in depth; has knowledge of the effectiveness, costs and time of implementation of construction projects under conditions of risk and uncertainty

- has an ordered and theoretically founded knowledge of the processes taking place in the full life cycle of building objects and the principles of their management, and knows and understands the need for systematic assessment and maintenance of their technical condition

#### Skills:

- uses advanced specialist tools to search for useful information, communication and obtaining software supporting the work of a designer and organizer of construction processes  
- is able to perform a preliminary economic analysis of the proposed solutions and undertaken engineering activities, is able to prepare the cost estimate and schedule of construction works, contract and business plan for a construction project, manage construction processes, set the duties and tasks of investor and construction supervision  
- using his knowledge, he is able to choose the right methods and tools (analytical, numerical, simulation, experimental) to solve technical problems

#### Social competences:

- is responsible for the reliability of the results of his work and the work of his team  
- understands the need to provide the society with knowledge about construction, passes this knowledge on in a commonly understandable way  
- is ready to think and act in an entrepreneurial manner

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lecture - written exam (open questions)

Grading scale (exam):

Grading scale defined% from:

90 very good (A)

85 good plus (B)

75 good (C)

65 sufficient plus (D)

55 sufficient (E)

below 54 insufficient (F)

Exercises - test

Projects - preparation and defense of three project exercises

### Programme content

The specificity of construction production. The issues of the theory of decision making according to the principles of rationality and according to the methods of making decisions. The principle of economy, the cycle of organized action. Decision theory classes, decision optimization factors. The structure of decision-making tasks and the structure of the characteristics of the decision maker. Management as a decision making process: management functions, decision situations, management techniques. Place and role of the decision maker in the management system. Decision making under conditions of risk and uncertainty. Risk identification methods. Use of operations research in the decision-making process. Time-cost methods in the decision making process. Information in the decision-making process: information gap, communication process, countermeasures to reduce or eliminate noise, information value, transformation. Databases, knowledge bases. Mathematical methods, elements of artificial intelligence, information technologies in decision support. Psychological aspects of decision making

### Course topics

Decision theory classes: rational decision theory and psychological decision theory, Data, information, knowledge in the decision-making process. Data acquisition and mining systems in decision-making. Communication process, noise and methods of their reduction. Decision trees, Artificial intelligence in decision-making support, Elements of reliability theory

### Teaching methods

Informative lecture supported by multimedia presentation / problem lecture;  
Exercise method / lobbying method;

## Bibliography

### Basic

1. Jaworski K. Metodologia projektowania realizacji budowy PWN Warszawa 1999
2. Kapliński O. (Ed.) Metody i modele badań w inżynierii przedsięwzięć budowlanych PAN, KILiW, IPPT, Seria Studia z Zakresu Inżynierii Nr 57. Warszawa 2007
3. Kapliński. O. Modelling of construction processes: A managerial approach KILiW PAN, Inst. Podstawowych Problemów Techniki, seria: Studia z Zakresu Inżynierii Nr 43 Warszawa 1997
4. Kukuła K., 2000. Decyzje menedżerskie w teorii i praktyce zarządzania, Wydawnictwa Naukowe Wydziału Zarządzania Uniwersytetu Warszawskiego

### Additional

1. Sadowski W. Teoria podejmowania decyzji. Wstęp do badań operacyjnych. PWN, Warszawa 1973
2. Szapiro T. Co decyduje o decyzji. PWN, Warszawa 1993

## Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,00
Classes requiring direct contact with the teacher	45	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,50