



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Project management [S2Eltech1E>POE-ZP]

### Course

Field of study

Electrical Engineering

Year/Semester

2/3

Area of study (specialization)

Electrical Systems in Industry and Vehicles

Profile of study

general academic

Level of study

second-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

The student has basic knowledge of management. The student has the ability to analyze and synthesize information, communicate effectively and express his/her own opinions and has the ability to work in a group.

### Course objective

To impart knowledge of the rationale for implementing pro-development changes and project management skills and competencies. Preparation for the role of a project manager.

### Course-related learning outcomes

Knowledge:

1. The student has the basic knowledge necessary to understand the social, economic, legal and other non-technical conditions of engineering activities, including the principles of sustainable development within the framework of the conducted subject, especially in relation to management science.
2. The student has basic knowledge of management, including quality management and business in the field of environmental engineering within the scope of the course.
3. The student knows the general principles of creation and development of forms of individual

entrepreneurship, using the knowledge of environmental engineering within the framework of the conducted subject, especially in relation to the problem of project management.

#### Skills:

1. The student is able to acquire information from the literature, databases and other sources, including in English or another foreign language recognized as the language of international communication in the field of electrical engineering; he/she is able to integrate information obtained, interpret it, as well as draw conclusions and formulate and justify opinions.
2. The student is able to interact and work in a group, assuming different roles in it, and is able to appropriately determine the priorities for the implementation of a task defined by him/herself or others; especially in relation to project management issues.
3. The student has the ability of self-education; understands the need for lifelong learning.

#### Social competences:

- 1 The student is aware of the responsibility for making decisions on the problems of the subject being taught.
2. The Student is prepared to think and act in an entrepreneurial manner.
3. The student is aware of the social role of a graduate of a technical university, is prepared to formulate and communicate, information and opinions on the achievements of technology and other aspects of engineering activity in a commonly understood manner.
4. The student is aware of the need to maintain ethical standards arising from the social role of a graduate of a technical university.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Conditions for passing this course are as follows:

- 1) preparation of final essay concerning project management- 50 points are possible to obtain.
- 2) test consisting of closed and open questions - 50 points are possible to obtain.

The passing threshold: obtaining at least 50 points including the final essay and the test.

### Programme content

The essence of project management. Methods of project planning. Typology of projects. Analysis of the project environment. Management in a project. Methods of project management. Profitability analysis of projects. Obtaining sources of financing for projects. Elements of strategic analysis for a project. Elements of marketing analysis for a project. Methods of estimating the duration and cost of project tasks. Network methods in project management. Calculation of costs for a project. Scheduling of the project. Project execution and control. Risk management in a project. Personnel aspects in project management. Motivation in the project.

### Course topics

Definition of Project and Project Management.

Key elements of project management: scope, time, cost, quality.

The importance of project management in organizations.

#### Typology of Projects

Classification of projects: by industry, scale, complexity, duration.

Examples of different types of projects: investment, research and development, IT.

#### Project Environment Analysis

Identification and analysis of stakeholders.

SWOT and PESTEL analysis in the context of projects.

The significance of environment analysis for project success.

#### Leadership in Projects

Roles and responsibilities of the project manager.  
Competencies and skills needed for effective project leadership.  
The importance of leadership in project management.

## Project Management Methods

Traditional project management methods: Waterfall, PRINCE2.  
Modern project management methods: Agile, Scrum, Kanban.  
Comparison and application of different methods in practice.

## Project Feasibility Analysis

Methods of assessing feasibility: cost-benefit analysis, ROI (Return on Investment).  
Using financial tools to evaluate projects.  
Practical examples of feasibility analysis.

## Securing Funding Sources for Projects

Funding sources: internal, external, mixed.  
Methods of obtaining funds: loans, grants, investors, crowdfunding.  
Practical aspects of securing financing.

## Strategic Analysis Elements for Projects

Analysis of the project mission and vision.  
Application of strategic tools: Balanced Scorecard, SWOT analysis.  
The significance of strategic analysis for project planning and execution.

## Marketing Analysis Elements for Projects

Market and competition analysis.  
Marketing strategies and their application in projects.  
Examples of marketing activities in the context of projects.

## Methods for Estimating Project Task Duration and Costs

Time estimation techniques: expert judgment, historical analysis, PERT and CPM techniques.  
Cost estimation methods: analogous, parametric, bottom-up analysis.  
Practical aspects of time and cost estimation.

## Network Methods in Project Management

Network techniques: Gantt charts, PERT (Program Evaluation and Review Technique), CPM (Critical Path Method).  
Application of network methods in project planning and control.  
Examples of the application of network methods.

## Cost Calculation for Projects

Cost calculation process: cost identification, resource allocation, budgeting.  
Tools and techniques used in project cost calculation.  
Practical aspects of budget management in projects.

## Project Scheduling

Stages of creating a project schedule: task identification, determining dependencies, setting deadlines.  
Scheduling tools: Microsoft Project, Primavera.  
Practical aspects of creating and managing a schedule.

## Project Execution and Control

Project execution process: implementation, monitoring, reporting.  
Project control tools and techniques: KPIs, dashboards, reports.  
Practical examples of project execution and control.

### Risk Management in Projects

Risk identification and analysis: techniques, tools.  
Risk management methods: avoidance, transfer, mitigation, acceptance.  
Examples of risk management in projects.

### Human Resource Aspects in Project Management

Role of the project team: selection, competencies, motivation.  
Methods of managing a project team: leadership styles, communication, conflict resolution.  
Practical aspects of human resource management in projects.

### Motivation in Projects

Theories of motivation: Maslow, Herzberg, Vroom.  
Motivational techniques: rewards, recognition, professional development.  
The importance of motivation for project success.

## Teaching methods

Lecture: informative lecture - multimedia presentation illustrated with examples given on the board.

## Bibliography

Basic:

1. Wysocki R., Efektywne zarządzanie projektami. Tradycyjne, zwinne, ekstremalne, Wyd. Helion, Gliwice 2013
2. Robert K. Wysocki, 2014, Effective Project Management: Traditional, Adaptive, Extreme, Seventh Edition, Wiley, Indianapolis; <http://index-of.co.uk/Project%20Management/Effective%20Project%20Management%20Traditional,%20Agile,%20Extreme%20by%20Robert%20K.%20Wysocki%207th%20Edition.pdf>
3. PMBOK® Guide – Sixth Edition, Pennsylvania, 2017
4. Wyrwicka M., Zarządzanie projektami, Wyd. Politechniki Poznańskiej, Poznań 2011.

Additional:

1. Głodzieński E., Efektywność w zarządzaniu projektami. Wymiary, koncepcje, zależności, PWE Warszawa 2017
2. Koszlajda A., Zarządzanie projektami IT. Przewodnik po metodykach, Wyd. Helion 2010
3. Kozarkiewicz A., Zarządzanie portfelami projektów, PWN, Warszawa 2012
4. Nowak, M.; Ziomek, J.; Intuitive and Rational Cognition in the Theory and Practice of Management Sciences, Problemy Zarządzania, 2/2019 (82), 142-154, 2019

## Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)	25	1,00