



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design thinking and action - Design Thinking

Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

Polish

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:

dr hab. inż. Jarosław Selech, prof. PP

e-mail: jaroslaw.selech@put.poznan.pl

Instytut Maszyn Roboczych i Pojazdów
Samochodowych

705 BM

Tel. 61 665 2227

Responsible for the course/lecturer:

dr inż. Dariusz Ulbrich

e-mail: dariusz.ulbrich@put.poznan.pl

Instytut Maszyn Roboczych i Pojazdów
Samochodowych

715 BM

Tel. 61 665 2248

Prerequisites



The student has basic knowledge of physics and mathematics and the ability to work in a team, also interdisciplinary. He is interested in learning innovative, engineering methods of problem solving. He is open to new experiences and willing to face his own weaknesses.

Course objective

The main goal is for students to acquire the ability to construct and implement project tasks in accordance with the Design Thinking methodology, and in particular to creatively solve problems with targeting people's needs. An additional goal is to improve the ability to work effectively in a team, in the context of the interpretation and presentation of the measurements and analyzes carried out - to acquire social competences, as well as the ability to use selected tools to solve engineering problems.

Course-related learning outcomes

Knowledge

Is aware of the latest trends in machine construction, i.e. automation and mechatronization, automation of machine design and construction processes, increased safety and comfort of operation, the use of modern construction materials.

Has extended basic knowledge necessary to understand specialist subjects and specialist knowledge about the construction, construction methods, manufacturing and operation of a selected group of working, transport, thermal and flow machines covered by the diploma path.

Has elementary knowledge of the impact of technology changes on the organization of social life as well as the health and psyche of individuals in human-machine contact.

Skills

Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.

Can organize and substantively manage the process of designing and operating a simple machine from a group of machines from the group covered by the selected diploma path.

Can interact with other people as part of teamwork (also of an interdisciplinary nature).

Social competences

Is ready to critically assess his knowledge and received content

Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own.

Is willing to think and act in an entrepreneurial manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The lecture part will include a written exam in the form of open questions or a test with the use of modern communication tools and platforms for distance learning (eCourses). The grade for the practical



part will be issued on the basis of the completed task (project and its presentation) and the student's work on individual classes.

Programme content

1. Basics of the "design thinking" methodology.
2. Defining target groups for research and research problems: empathy map, stakeholder map.
3. Techniques of extracting information and arranging questions as well as good and bad practices - case studies.
4. Solving engineering problems using the "design thinking" methodology.
5. Analysis of market trends.
6. Techniques of creative idea generation.
7. Prototyping - various tools and techniques were used.
8. Testing the prototype.
9. Methods of presenting the results as an important element of popularizing scientific research.

Teaching methods

Cognitive and communication method - with the use of various media and varied forms of work, for example: "brainstorming", SWOT analysis technique, decision tree technique, "snowball" method, constructing "mind maps", working in a group.

Bibliography

Basic

1. Liedtka Jeanne, Ogilvie Tim, Designing for Growth. A Design Thinking Tool Kit for Managers, Columbia University Press, 2011.
2. Liedtka Jeanne, Ogilvie Tim, Designing for Growth. Field Book, University Press Group Ltd, 2014.
3. Kelley T., The Art Of Innovation, PROFILE BOOKS, 2016.
4. Brown T., Zmiana przez design: jak design thinking zmienia organizacje i pobudza innowacyjność, Wrocław 2013.
5. Materiały przekazane przez prowadzących na zajęciach.

Additional

1. Cross N., Design Thinking: Understanding How Designers Think and Work, 2011.
2. Lockwood T., Design Thinking: Integrating Innovation, Customer Experience, and Brand Value, 2010.



3. Hanington Bruce, Bella Martin: Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions, 2012: Rockport Publishers.

4. Helman Joanna, Rosienkiewicz Maria, Design Thinking jako metoda pobudzania innowacji, w: Innowacje w Zarządzaniu i Inżynierii Produkcji, red. R. Knosal, 2017: Oficyna Wydawnicza.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for lectures /classes (tutorials), preparation for tests/test/final test/, project/presentation preparation, writing essay, case-study analysis, activity during meetings, watching movies) ¹	20	1,0

¹ delete or add other activities as appropriate