

Course code:

Plan position:

A. INFORMATION ABOUT THE COURSE

B. Basic information

Name of course	Design Thinking in Science and Engineering
Field of studies	Mechanical Engineering
Level of studies	First degree
Profile of studies	Academic
Form of studies	Full-time
Specialty	Research and Development Production Maintenance
Unit responsible for the field of studies	Faculty of Mechanical Engineering
Name and academic degree of teacher(s)	Piotr Szewczykowski, PhD
Introductory courses	Materials Science and Engineering
Introductory requirements	Knowledge of MS Office package, ability to use databases of scientific publications

C. Semester/week schedule of classes

Semester	Lectures (W)	Auditorium classes (Ć)	Laboratory classes (L)	Project classes (P)	Seminar (S)	Field classes (T)	Number of ECTS points
Winter/Summer	15			15			4

2. LEARNING OUTCOME

No.	Learning outcomes description	The reference to the learning outcomes of specific field of study	The reference to the learning outcomes for the area
KNOWLEDGE			
K1	A student has management knowledge, including quality management, project management, and others	K_W10	P7S_WK
SKILLS			
S1	A student is able to communicate using various techniques in a professional environment and other environments, including in the form of a debate and scientific publication	K_U09	P7S_UK
S2	A student is able to cooperate in teamwork with other people and can manage the work of a team	K_U11	P7S_UO
SOCIAL COMPETENCES			
SC1	A student can think and act in a creative and entrepreneurial way	K_K03	P7S_KO

3. TEACHING METHODS

A. Traditional methods used ***

multimedia lecture, laboratory, and other methods, e.g., CES Edupack software, videos, books, catalogs, diagrams, blackboard, online techniques, exercise workbook classes

B. Distance learning methods used ***

Synchronous method (classes conducted in a way that ensures direct interaction between the student and the teacher in real time, enabling immediate flow of information, the method can be used only if it is provided for in the study plan for a given cycle of education):
e.g. remote lecture in the form of videoconference, remote discussion, etc.

Asynchronous method used as an auxiliary (a method that does not ensure direct interaction between the student and the teacher in real time, used only as an auxiliary / complementary method):
e.g. online educational videos, online multimedia presentations, etc.

4. METHODS OF EXAMINATION

Written test/colloquium, reports from project work

5. SCOPE

Lectures	Introduction to design thinking methodology, the importance of communication skills, brainstorming theory and practice, prototyping, teamwork principles, how to incorporate design thinking methodology in science or engineering projects and enterprises, the power of empathy and observations, map of empathy, building a persona, the rules of preparing an interview with customers and data collection
Project	Case studies of applying a design thinking methodology in practice, doing small projects and exercises for each stage: empathy, define, ideate, prototype, and test. Involving learned techniques in a more extensive project realized in a team.

6. METHODS OF VERIFICATION OF LEARNING OUTCOMES

LEARNING OUTCOME	Form of assessment					
	Oral examination	Written exam	Colloquium	Project	Reports	Class attendance
K1			x	x		x
S1-S2			x	x		x
SC1			x	x		x

7. LITERATURE

Basic literature	- Brown T, 2019, Change by Design, Harper Business, New York
Supplementary literature	- Vianna M et al., 2011, Design Thinking, MJV Press, Rio de Janeiro

8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	30
	Supervision hours	10
	Preparation for classes	10

Student's own work	Reading assignments	20
	Other (preparation for exams, tests, carrying out a project etc)	40
Total student workload		110
Number of ECTS points		4