

COURSE DESCRIPTION CARD – SPECIMEN

| Faculty of Mechanical Engineering | | | | | | | | | |
|--------------------------------------|--|---|----|---|----|----|---|--------------------------------|--------|
| Field of study | Mechatronics | | | | | | Degree level and programme type | Bachelor degree/ Master degree | |
| Specialization/ diploma path | | | | | | | Study profile | | |
| Course name | Theory of solving innovative problems | | | | | | Course code | IS-FME-00257W | |
| | | | | | | | Course type | elective | |
| Forms and number of hours of tuition | L | C | LC | P | SW | FW | S | Semester | winter |
| | 15 | | | | | | | No. of ECTS credits | 1 |
| Entry requirements | TRIZ methodical toolset. Acquiring the ability to create new innovative ideas and solve engineering problems. | | | | | | | | |
| Course objectives | Understanding the basic terminology in the area of creativity, creativity methods and new methods of creating innovation. Understanding the basic principles of creativity in future perspective. Teach students who to be more creative. | | | | | | | | |
| Course content | Overcoming barriers in creative problem solving, vector of inertia - how to overcome it?, Stimulating imagination and creativity, methods of identifying and visualizing problems, methods of generating new ideas, review of creative thinking techniques, history of TRIZ, technical systems and their functions, Subsystems and supersystems, system approach, laws of technical systems development, striving for perfection - the Ideal End result, analysis of technical and physical contradictions, analysis of means to overcome contradictions, basics of removing technical / physical contradictions, 40 inventive tricks, algorithm for solving inventive tasks TRIZ. | | | | | | | | |
| Teaching methods | Lecture | | | | | | | | |
| Assessment method | written exam | | | | | | | | |
| Symbol of learning outcome | Learning outcomes | | | | | | Reference to the learning outcomes for the field of study | | |
| LO1 | is ready to think and act in an entrepreneurial manner | | | | | | MK1_K05 | | |
| LO2 | is ready to identify problems and solve dilemmas that arise when generating new technological solutions | | | | | | MK1_K04 | | |
| LO3 | identifies and analyzes key issues related to sources of creativity, | | | | | | MK1_W01, MK1_W11 | | |

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| LO4 | knows and understands technical systems and their functions | MK1_U01 | |
| LO5 | defines and describes the basic issues related creative thinking, methods of creative problem solving | MK1_K05 | |
| LO6 | | | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | Type of tuition during which the outcome is assessed | |
| LO1 | written exam | L | |
| LO2 | written exam | L | |
| LO3 | written exam | L | |
| LO4 | written exam | L | |
| LO5 | written exam | L | |
| LO6 | | | |
| Student workload (in hours) | | No. of hours | |
| Calculation | Participation in lectures | 15 | |
| | Preparation for passing lecture | 9 | |
| | Participation in consultation | 1 | |
| | | | |
| | | | |
| | | TOTAL: | 25 |
| Quantitative indicators | | HOURS | No. of ECTS credits |
| Student workload – activities that require direct teacher participation | | 16 | 0,5 |
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| Basic references | 1. Ikovenko S. Współczesna Teoria Rozwiązywania Innowacyjnych Zadań, Novosimo Warszawa 2017r. 2. Cempel C., Inżynieria kreatywności w projektowaniu innowacji. Politechnika Poznańska 2013. 3. Proctor T., Twórcze rozwiązywanie problemów, Podręcznik dla menedżerów, GWP, Gdańsk 2002. | | |
| Supplementary references | 1. DeBono E., Myślenie równoległe, Wyd. Prima, Warszawa 1998. 2. Alder H., Inteligencja kreatywna, Wyd. Amber, Warszawa 2003. 3. Kelley T., Littman J., Sztuka innowacji, lekcja kreatywności z doświadczeń czołowej amerykańskiej firmy projektowej, MT Biznes, Warszawa 2009. 4. Michalewicz Z., Fogel D.B., Jak to rozwiązać czyli nowoczesna heurystyka, WNT, Warszawa 2006. 4. K. Robinson, Out of minds, learning to be Craetive, Wiley2017 | | |
| Organisational unit conducting the course | | Date of issuing the programme | |
| Author of the | Jerzy Sienkiewicz, PhD | 5.03.2020 | |

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| programme | translation by Izabela Senderacka, PhD | |
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,
S – seminar

Please notice!

Depending on number of students enrolled for the subject hours of tuition are as follows (for each 30 hours given in course description card):

1 – 2 students - 5 hours of tuition hours;

3 – 4 students - 8 hours of tuition;

5 – 6 students - 11 hours of tuition;

7 – 8 students - 15 hours of tuition;

9 and more students - hours of tuition given by a teacher as regular classes.