COURSE DESCRIPTION CARD – SPECIMEN

<table>
<tr><td colspan="10">Faculty of Mechanical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6">Mechatronics</td><td colspan="2">Degree level and programme type</td><td>Bachelor</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6">general</td><td colspan="2">Study profile</td><td></td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Mobile robots</td><td colspan="2">Course code</td><td>IS-FME-00253S</td></tr>
<tr><td colspan="2">Course type</td><td>obligatory</td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>summer</td></tr>
<tr><td>30</td><td></td><td>15</td><td>15</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>5</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Introduction to robotics, Engineering Mechanics</td></tr>
<tr><td>Course objectives</td><td colspan="9">The purpose of the subject is to get to know by the student the main elements of the mobile robot, the rules of their selection, advantages and disadvantages. Gain knowledge of solutions used in robot mobility, control algorithms, description of kinematics and dynamics of mobile robots. Acquisition of skills in building concepts, motion planning and programming of robots with different types of mobility.</td></tr>
<tr><td>Course content</td><td colspan="9">Introduction: Historical features, concepts, and definitions. Classification due to mobility, application, advantages and disadvantages. Mobile wheeled robots, various configurations. Walking machines, division, structures, gait patterns. Drives and sensors used in mobile robots. Laboratory: motion planning and control of mobile robots. Project: mobile robot concept design</td></tr>
<tr><td>Teaching methods</td><td colspan="9">power-point presentations, discussion, other documents given by the teacher, programming of various types of industrial robots,</td></tr>
<tr><td>Assessment method</td><td colspan="9">lecture – written exam; laboratory classes – laboratory reports, project – project report</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Learning outcomes</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="7">replaces and describes the main components of the mobile robot</td><td colspan="2"></td></tr>
<tr><td>LO2</td><td colspan="7">classifies robots by type of mobility and develops control algorithms</td><td colspan="2"></td></tr>
<tr><td>LO3</td><td colspan="7">designs the concept of a mobile robot and tests its systems</td><td colspan="2"></td></tr>
<tr><td>LO4</td><td colspan="7">can work individually and as a team</td><td colspan="2"></td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Methods of assessing the learning outcomes</td><td colspan="2">Type of tuition during which the outcome is assessed</td></tr>
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LO1	**written exam, activity during classes**	
LO2	**written exam, activity during classes**	
LO3	**project report, student activity on laboratory classes**	
LO4	**laboratory reports, student activity on laboratory classes**	
Student workload (in hours)		**No. of hours**
Calculation	**lecture attendance**	**30**
	participation in lecture, laboratory and project classes	**30**
	working on projects, reports, etc.	**30**
	participation in student-teacher sessions related to the classes /project	**15**
	implementation of project tasks and preparation for and participation in exams/tests	**30**
	TOTAL:	**135**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**75**	**2,5**
Student workload – practical activities	**120**	**4**

Basic references	**1. Stadler W.: Analytical robotics and mechatronics. McGraw-Hill, Inc., New York, 1995.** **2. Schraft R.D., Schmierer G.: Service robots: products, scenarios, visions. A K Peters, Natick, 2000.**	
Supplementary references	**1. Chevallereau C. [et al.]: Bipedal robots : modeling, design and walking synthesis. ISTE,London; John Wiley a. Sons,Hoboken, 2009.** **2. Lantos B., MártonL.:Nonlinear control of vehicles and robots. Springer-Verlag, London, 2011.**	
Organisational unit conducting the course	**Department of Applied Mechanics and Computer Science**	**Date of issuing the programme**
Author of the programme	**Justyna Tołstoj-Sienkiewicz, PhD**	**20.03.2021**

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.