COURSE DESCRIPTION CARD – SPECIMEN

<table>
<tr><td colspan="10">Faculty of Electrical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6">Engineering</td><td colspan="2">Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6">-</td><td colspan="2">Study profile</td><td>-</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Physics</td><td colspan="2">Course code</td><td>IS-FEE-10024W</td></tr>
<tr><td colspan="2">Course type</td><td>elective</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>winter</td></tr>
<tr><td>30</td><td>30</td><td></td><td></td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Mathematics - basic engineering level</td></tr>
<tr><td>Course objectives</td><td colspan="9">Knowledge and understanding of the basic laws of the classical physics and selected elements of the modern physics. Acquiring the skills to solve the physics problems.</td></tr>
<tr><td>Course content</td><td colspan="9">Lecture: 1. Basic laws of classical mechanics. Inertial and non-inertial frames. Galilean transformation. The law of universal gravitation. 2. Harmonic vibrations. Damped vibrations. Forced vibrations. 3. Mechanical waves, acoustic waves. Wave interference. Doppler effect. 4. Geometric and wave optics. 5. Electricity and magnetism. Maxwell's equations. Electromagnetic waves. 6. Basics of modern physics. Perfect black body, external photoelectric effect, Compton effect. Bohr Atomic Model. Classes: Solving problems in the field of classical mechanics, geometric and wave optics, wave and vibrating motion, electricity and magnetism.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Lecture and discussion, classes</td></tr>
<tr><td>Assessment method</td><td colspan="9">Lecture – exam;
Classes - evaluation of solutions of selected physics problems and presentation of these solutions</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes
After completing this course student</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Describes the meaning of the basic principles of physics</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">Assigns the relevant principles and rules for existing problems</td><td></td></tr>
<tr><td>LO3</td><td colspan="8">Uses the learned physical laws to solve
typical physics problems</td><td></td></tr>
<tr><td>LO4</td><td colspan="8">Analyzes and solves the engineering problems with the use of physical approach</td><td></td></tr>
</table>

LO5		
LO6		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	exam	L
LO2	partial evaluation of problems solutions	L, C
LO3	partial evaluation of problems solutions	L, C
LO4	partial evaluation of problems solutions	L, C
LO5		
LO6		

Student workload (in hours)		No. of hours
Calculation	lecture	30
	classes	30
	preparation for classes	15
	work on solutions of selected physics problems	25
	TOTAL:	100

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	60	2
Student workload – practical activities	70	2,5

Basic references	1. D. Halliday, R. Resnick, Physics 1 and Physics 2, Wiley; 3rd edition 2. Feynman R. P., Leighton R. B., Sands M, The Feynman Lectures on Physics, Basic Books; New Millennium ed. Edition 3. https://openstax.org/details/books/university-physics
Supplementary references	1. D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, John Wiley and Sons; 7th edition

Organisational unit conducting the course	Department of Automatic Control and Robotics	Date of issuing the programme
Author of the programme	Maciej Ciężkowski, Ph. D.	12.02.2021

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar