**COURSE DESCRIPTION CARD – SPECIMEN**

<table>
<tr><td colspan="10">Faculty of Electrical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6">Automatics and Robotics</td><td>Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6">-</td><td>Study profile</td><td>-</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Computer-Based Measurement Systems</td><td>Course code</td><td>IS-FEE-10058W</td></tr>
<tr><td>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>15</td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>3</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Mathematics I, II, Signals Theory or equivalent</td></tr>
<tr><td>Course objectives</td><td colspan="9">To familiarize students with the methods and ways of measurements of physical quantities using the computer-based measurement system. Presentation of the methods of measurement signals processing, their acquisition and graphical representation.</td></tr>
<tr><td>Course content</td><td colspan="9">Lecture:<br>Fundamental measurement signals and sensors used in automation. Characteristics of measurement signals. Filtration methods and analysis of measurement errors. The rules of a program implementation in the LabView environment. The basic blocks of the LabView package. Control of measuring devices by a computer. Acquisition of measurement data. Analysis and presentation of data. Graphical user interface.<br>Project:<br>Measurement, acquisition and representation of real digital and analogue signals. Selection of measurement methodology and of construction of filters applied to measurement signals. Creating dedicated applications for acquisition, processing and representation of measurement signals.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Power-Point presentations, LabView software, instructions</td></tr>
<tr><td>Assessment method</td><td colspan="9">lecture – written test; project – project implementation, presentation and discussion</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Lists, classifies and characterizes measurement signals and elements of a computer measuring system</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">Selects a proper method for measurement of elementary physical parameters.</td><td></td></tr>
<tr><td>LO3</td><td colspan="8">Presents properly measurement results.</td><td></td></tr>
</table>

| | | |
|---|---|---|
| LO4 | Is able to implement designed algorithms for acquisition and processing of measurement signals. | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | Type of tuition during which the outcome is assessed |
| LO1 | L: written test | L |
| LO2 | L: written test, P: project evaluation, activity on classes | L, P |
| LO3 | L: written test, P: project evaluation, activity on classes | L, P |
| LO4 | P: project evaluation, activity on classes | P |
| Student workload (in hours) | | No. of hours |
| Calculation | Participation in lectures | 15 |
| | Participation in project classes | 30 |
| | Preparation for exams/tests | 10 |
| | Working on projects, reports, etc. | 25 |
| | Participation in consultations | 3 |
| | TOTAL: | 80 |

| Quantitative indicators | HOURS | No. of ECTS credits |
|---|---|---|
| Student workload – activities that require direct teacher participation | 48 | 1,5 |
| Student workload – practical activities | 55 | 2 |

| | |
|---|---|
| Basic references | 1. Training materials of National Instruments (online).<br>2. Pedro Ponce-Cruz, Fernando D. Ramírez-Figueroa. : Intelligent control systems with LabVIEW, London : Springer-Verlag, 2010.<br>3. Clark Cory L. LabView digital signal processing and digital communication, MoGraw-Hill, New York, 2005.<br>4. Janusz Walczak, Dariusz Grabowski, Marcin Maciążek: Introduction to digital signal processing, Gliwice : Wydaw. Politechniki Śląskiej, 2013. |
| Supplementary references | 1. LabView Core 1 and 2, course manual and exercises. National Instruments Corporation, 2009. |

| | | |
|---|---|---|
| Organisational unit conducting the course | Department of Automatic Control and Robotics | Date of issuing the programme |
| Author of the programme | Michał Ostaszewski, PhD | 17.02.2020 |

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