Załącznik nr 2 do Zarządzenia Nr 915 z 2019 r. Rektora PB

COURSE DESCRIPTION CARD – SPECIMEN

<table>
<tr><th colspan="10">Faculty of Electrical Engineering</th></tr>
<tr><td>Field of study</td><td colspan="7">Electrical and Electronic Engineering</td><td>Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="7">-</td><td>Study profile</td><td>-</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="7" rowspan="2">Microprocessor Technique and Microcontrollers</td><td>Course code</td><td>IS-FEE-10009S</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>summer</td></tr>
<tr><td>30</td><td>-</td><td>30</td><td>-</td><td>-</td><td>-</td><td>-</td><td>No. of ECTS credits</td><td>6</td></tr>
<tr><td>Entry requirements</td><td colspan="9">-</td></tr>
<tr><td>Course objectives</td><td colspan="9">Knowledge about the basic problems of the microprocessor technique and microcontrollers.
Skills on programming of microprocessor systems in low-level and high-level languages.</td></tr>
<tr><td>Course content</td><td colspan="9">Lecture:
Binary arithmetic. Basic topics of the microprocessor engineering. Microprocessor system structures and main components: processors, memories, basic peripheral devices, standard buses, additional circuits. Interrupt systems. Methods of input/output device service. Input/output binary and analogue devices. Exemplary microcontroller family: standard structure, instruction list, peripherals, interrupts, extensions.
Laboratory classes:
Practical exercises in programming of basic algorithms and I/O device service in machine- and high-level language.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Lecture: presentations
Laboratory classes: set of exercises</td></tr>
<tr><td>Assessment method</td><td colspan="9">Written exam and reports</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">describes the activity of microprocessor, microcontrollers and whole microprocessor system</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">distinguishes: types of processors, interrupt systems, semiconductor memories, peripheral device service techniques</td><td></td></tr>
<tr><td>LO3</td><td colspan="8">uses suitable programming tools</td><td></td></tr>
<tr><td>LO4</td><td colspan="8">writes software servicing the microcontroller I/O devices</td><td></td></tr>
<tr><td>LO5</td><td colspan="8">writes software implementation of designed algorithm</td><td></td></tr>
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<tr><th>Symbol of learning outcome</th><th colspan="2">Methods of assessing the learning outcomes</th><th colspan="2">Type of tuition during which the outcome is assessed</th></tr>
<tr><td>LO1</td><td colspan="2">written exam test on lecture content</td><td colspan="2">L</td></tr>
<tr><td>LO2</td><td colspan="2">written exam test on lecture content</td><td colspan="2">L</td></tr>
<tr><td>LO3</td><td colspan="2">evaluating the student's reports</td><td colspan="2">LC</td></tr>
<tr><td>LO4</td><td colspan="2">evaluating the student's reports and written tests</td><td colspan="2">LC</td></tr>
<tr><td>LO5</td><td colspan="2">evaluating the student's reports and written tests</td><td colspan="2">LC</td></tr>
<tr><td colspan="3">Student workload (in hours)</td><td colspan="2">No. of hours</td></tr>
<tr><td rowspan="9">Calculation</td><td colspan="2">lecture attendance</td><td colspan="2">30</td></tr>
<tr><td colspan="2">individual work on lecture topics</td><td colspan="2">15</td></tr>
<tr><td colspan="2">preparation for exam</td><td colspan="2">10</td></tr>
<tr><td colspan="2">participation in laboratory classes</td><td colspan="2">30</td></tr>
<tr><td colspan="2">preparation for laboratory classes and drawing up reports</td><td colspan="2">40</td></tr>
<tr><td colspan="2">participation in student-teacher sessions related to the classes</td><td colspan="2">10</td></tr>
<tr><td colspan="2">preparation for laboratory classes tests</td><td colspan="2">10</td></tr>
<tr><td colspan="2">exam and lab-classes tests attendance</td><td colspan="2">5</td></tr>
<tr><td colspan="2">TOTAL:</td><td colspan="2">150</td></tr>
<tr><td colspan="3">Quantitative indicators</td><td>HOURS</td><td>No. of ECTS credits</td></tr>
<tr><td colspan="3">Student workload – activities that require direct teacher participation</td><td>75</td><td>3</td></tr>
<tr><td colspan="3">Student workload – practical activities</td><td>82</td><td>3</td></tr>
<tr><td>Basic references</td><td colspan="4">1. William Stallings: Computer Organization and Architecture, ISBN: 9780135160930; 896 p, 2019, Pearson.
2. Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi: The AVR Microcontroller and Embedded Systems, ISBN: 0138003319; 781 p, 2011, Pearson/Prentice Hall.
3. Stuart Ball: Embedded Microprocessor Systems, ISBN: 0750675349; 432 p, 2002, Elsevier Newnes.</td></tr>
<tr><td>Supplementary references</td><td colspan="4">1. Lech Grodzki: Presentations for lecture. Updated each semester.
2. Lech Grodzki: Manuals for laboratory classes. Updated each semester.</td></tr>
<tr><td>Organisational unit conducting the course</td><td colspan="2">Department of Control Engineering and Robotics</td><td colspan="2">Date of issuing the programme</td></tr>
<tr><td>Author of the programme</td><td colspan="2">Lech Grodzki, PhD Eng</td><td colspan="2">15.02.2021</td></tr>
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar