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

**COURSE DESCRIPTION CARD – SPECIMEN**

|  |  |  |  |  |  |  |  |  |  |  |
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| **Faculty of Electrical Engineering** | | | | | | | | | | |
| **Field of study** | **Electrical and Electronic Engineering** | | | | | | | **Degree level and programme type** | **Bachelor's degree** | |
| **Specialization/ diploma path** | **-** | | | | | | | **Study profile** | **-** | |
| **Course name** | **Microprocessor Technique  and Microcontrollers** | | | | | | | **Course code** | **IS-FEE-10009W** | |
| **Course type** | **elective** | |
| **Forms and number of hours of tuition** | **L** | **C** | **LC** | **P** | **SW** | **FW** | **S** | **Semester** | **winter** | |
| **30** |  | **30** |  |  |  |  | **No. of ECTS credits** | **6** | |
| **Entry requirements** | **-** | | | | | | | | | |
| **Course objectives** | Knowledge about the basic problems of the microprocessor technique and microcontrollers.  Skills on programming of microprocessor systems in low-level and high-level languages. | | | | | | | | | |
| **Course content** | 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. | | | | | | | | | |
| **Teaching methods** | Lecture: presentations  Laboratory classes: set of exercises | | | | | | | | | |
| **Assessment method** | Written exam and reports | | | | | | | | | |
| **Symbol of learning outcome** | **Learning outcomes** | | | | | | | | **Reference to the learning outcomes for the field of study** | |
| **LO1** | describes the activity of microprocessor, microcontrollers and whole microprocessor system | | | | | | | |  | |
| **LO2** | distinguishes: types of processors, interrupt systems, semiconductor memories, peripheral device service techniques | | | | | | | |  | |
| **LO3** | uses suitable programming tools | | | | | | | |  | |
| **LO4** | writes software servicing the microcontroller I/O devices | | | | | | | |  | |
| **LO5** | writes software implementation of designed algorithm | | | | | | | |  | |
| **LO6** |  | | | | | | | |  | |
| **Symbol of learning outcome** | **Methods of assessing the learning outcomes** | | | | | | | | **Type of tuition during which the outcome is assessed** | |
| **LO1** | written exam test on lecture content | | | | | | | | L | |
| **LO2** | written exam test on lecture content | | | | | | | | L | |
| **LO3** | evaluating the student's reports | | | | | | | | LC | |
| **LO4** | evaluating the student's reports and written tests | | | | | | | | LC | |
| **LO5** | evaluating the student's reports and written tests | | | | | | | | LC | |
| **LO6** |  | | | | | | | |  | |
| **Student workload (in hours)** | | | | | | | | | **No. of hours** | |
| **Calculation** | lecture attendance | | | | | | | | 30 | |
| individual work on lecture topics | | | | | | | | 15 | |
| preparation for exam | | | | | | | | 10 | |
| participation in laboratory classes | | | | | | | | 30 | |
| preparation for laboratory classes and drawing up reports | | | | | | | | 40 | |
| participation in student-teacher sessions related to the classes | | | | | | | | 10 | |
| preparation for laboratory classes tests | | | | | | | | 10 | |
| exam and lab-classes tests attendance | | | | | | | | 5 | |
| **TOTAL:** | | | | | | | | **150** | |
| **Quantitative indicators** | | | | | | | | | **HOURS** | **No. of ECTS credits** |
| **Student workload – activities that require direct teacher participation** | | | | | | | | | **75** | **3** |
| **Student workload – practical activities** | | | | | | | | | **82** | **3** |
| **Basic references** | *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.* | | | | | | | | | |
| **Supplementary references** | *1. Lech Grodzki: Presentations for lecture. Updated each semester.*  *2. Lech Grodzki: Manuals for laboratory classes. Updated each semester.* | | | | | | | | | |
| **Organisational unit conducting the course** | **Department of Control Engineering and Robotics** | | | | | | | | **Date of issuing the programme** | |
| **Author of the programme** | Lech Grodzki, PhD Eng | | | | | | | | 15.02.2021 | |

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

S – seminar