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: presentationsLaboratory 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