**COURSE DESCRIPTION CARD**

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| **Faculty of Electrical Engineering** |
| **Field of study** | **Electrical and Electronics Engineering** | **Degree level and programme type** | **bachelor’s degree,****full time programme** |
| **Specialization/ diploma path** | **-** | **Study profile** | **-** |
| **Course name** | **Electronics 2** | **Course code** | **IS-FEE-10030S** |
| **Course type** | **elective** |
| **Forms and number of hours of tuition**  | **L** | **C** | **LC** | **P** | **SW** | **FW** | **S** | **Semester** | **summer** |
| **15** | **15** | **30** |  |  |  |  | **No. of ECTS credits** | **6** |
| **Entry requirements** | Electronics 1 |
| **Course objectives** | The objective of this course is to provide students with deep understanding of advanced analogue circuits. The laboratory component of the course provides students with an opportunity to design, simulate and test various circuits discussed in class. |
| **Course content** | Frequency response of single transistor amplifiers. Linear applications of operational amplifiers. Nonlinear applications of operational amplifiers. Voltage comparators. Current sources. Active filters. Output stages and power amplifiers. Voltage regulators. RC oscillators. Optoelectronic devices and circuits. Several lab and homework assignments in this class will require the use of PSpice software |
| **Teaching methods** | lecture, class, laboratory class, computer simulations |
| **Assessment method** | lecture: written exam; class: two tests; laboratory class: verification of preparation for classes, evaluation of reports |
| **Symbol of learning outcome**  | **Learning outcomes** | **Reference to the learning outcomes for the field of study** |
| **LO1** | describes the basic principles of operation of the electronic circuits; |  |
| **LO2** | applies knowledge of mathematics and engineering to analysis and design of analog circuits; |  |
| **LO3** | uses PSPICE to analysis and design of electronic circuits; |  |
| **LO4** | can prepare and conduct experiments using datasheets and application notes; |  |
| **LO5** | analyzes and interprets measurement data and prepares reports |  |
| **Symbol of learning outcome** | **Methods of assessing the learning outcomes** | **Type of tuition during which the outcome is assessed** |
| **LO1** | written exam, tests | L, LC |
| **LO2** | written exam, tests | L, C, LC |
| **LO3** | verification of preparation for classes, evaluation of reports | LC |
| **LO4** | tests, evaluation of class work, evaluation of reports | LC |
| **LO5** | evaluation of reports | LC |
| **Student workload (in hours)** | **No. of hours** |
| **Calculation** | lecture attendance | 15 |
| participation in classes | 15 |
| preparation for classes | 15 |
| participation in laboratory classes | 30 |
| preparation for laboratory classes | 20 |
| working on projects, reports | 25 |
| participation in student-teacher sessions related to the classes/laboratory classes | 5 |
| preparation for and participation in exams/tests | 25 |
| **TOTAL:** | 150 |
| **Quantitative indicators** | **HOURS** | **No. of ECTS credits** |
| **Student workload – activities that require direct teacher participation** | 65 | 2,6 |
| **Student workload – practical activities** | 110 | 4,4 |
| **Basic references** | 1. Sedra A.S., Smith K. C.: Microelectronic Circuits. Oxford University Press, 2004.
2. Sinclair I., Dunton J.: Practical Electronics Handbook, Elsevier Science & Technology, 2006 (Available from: ProQuest Ebook Central)
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| **Supplementary references** | 1. Boysen E., Kybett H.: Complete Electronics Self-Teaching Guide with Projects, John Wiley & Sons, Inc., 2012 (Available from: ProQuest Ebook Central)
2. Singh S.: Electronics Engineering, Alpha Science International, New Delhi, 2014 (Available from: ProQuest Ebook Central)
3. Westcott S., Westcott J.R.: Basic Electronics: Theory and Practice, Mercury Learning & Information, 2015 (Available from: ProQuest Ebook Central)
4. Saggio G.: Principless of analog electronic. CRC Press, 2014.
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| **Organisational unit conducting the course** | Department of Automatic Control and Robotics | **Date of issuing the programme** |
| **Author of the programme** | Andrzej Karpiuk, Ph.D. | 24.02.2021 |

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

**S – seminar**