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

**COURSE DESCRIPTION CARD**

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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** | **Electrical Circuits 2** | **Course code** | **IS-FEE-10085S** |
| **Course type** | **elective** |
| **Forms and number of hours of tuition**  | **L** | **C** | **LC** | **P** | **SW** | **FW** | **S** | **Semester** | **summer** |
| **15** | **30** | **15** |  | **15** |  |  | **No. of ECTS credits** | **6** |
| **Entry requirements** | **Electrical Circuits 1 or relevant** |
| **Course objectives** | **To receive the abilities to perform an analysis of linear AC circuits with coupling elements, 3-phase systems and transient states. To provide experiments related to these topics and measure and calculate currents, voltages and powers. To use of good terminology in discussion on electrical problems. To use simulation for design and analysis of electrical circuits.** |
| **Course content** | **Self inductance and mutual inductance. Analysis of circuits with magnetic coupling. Air transformer. Calculations and measurement of power in 3-phase systems. Balanced and unbalanced 3-phase circuits, Analysis of transient states in linear RC and RL circuits.**  |
| **Teaching methods** | **problem-based-learning, consultations, self-work, laboratory and simulation experiments** |
| **Assessment method** | **Problems are presented for students at the beginning of semester. The evaluation is performing during personal discussion on several problems concerning all indicated topics.** |
| **Symbol of learning outcome**  | *Student who has passed this course :* | **Reference to the learning outcomes for the field of study** |
| **LO1** | **uses the proper concepts for analysis of relevant topics from the electrical circuits domain** |  |
| **LO2** | **classifies the 3-phase circuits and applies the proper methods for analysis** |  |
| **LO3** | **provides experiments concerning the electric circuits with the use of proper instrumentation and confirm the results with simulations** |  |
| **LO4** | **calculates the transient states in the circuits, makes the comments of expected results and presents them in graphical forms** |  |
| **LO5** | **uses the simulation software to analyse and design of an electrical circuit** |  |
| **Symbol of learning outcome** | **Methods of assessing the learning outcomes** | **Type of tuition during which the outcome is assessed** |
| **LO1** | **evaluating the student's solutions of presented problems, quizzes at lecture** | **L, C** |
| **LO2** | **quizzes at lectures and final evaluation** | **L** |
| **LO3** | **evaluating the student's solutions of presented problems, personal assessment on the base of partial evaluations** | **LC, SW** |
| **LO4** | **evaluating the student's solutions of presented problems, personal assessment on the base of partial evaluations** | **C** |
| **LO5** | **evaluation of the quality of report on designed project or analysed circuit with the use of simulation software** | **SW** |
| **LO6** |  |  |
| **Student workload (in hours)** | **No. of hours** |
| **Calculation** | **lecture attendance** | **15** |
| **attending the class sessions** | **30** |
| **self-working on learning and preparing the problems solutions** | **39** |
| **preparation for and participation in exams/tests** | **25** |
| **attending the laboratory and workshop sessions** | **30** |
| **preparation for lab experiments and elaboration of reports** | **30** |
| **participation in student-teacher sessions related to the classes and lecture** | **10** |
| **TOTAL:** | **170** |
| **Quantitative indicators** | **HOURS** | **No. of ECTS credits** |
| **Student workload – activities that require direct teacher participation** | **75** | **3** |
| **Student workload – practical activities** | **130** | **5** |
| **Basic references** | 1. Thomas R.E., Rosa A. J., Toussaint G.J.: The Analysis & Design of Linear Circuits. 6th ed, Wiley Inc. 2009;2. Tung L.J., Kwan B.W.: Circuit Analysis. World Scientific 2001;3. Irvin J.D., Nelms R.M.: Basic Engineering Circuits Analysis. International Student Version. John Willey&Sons.Inc. 20084. https://www.khanacademy.org/science/electrical-engineering |
| **Supplementary references** | 1. Michael E. Auer: Three Phase Circuits (https://pl.scribd.com/document/248006055/1-Three-Phase-Circuits-pdf);2. <https://www.youtube.com/watch?v=9wrAoE1fXCo>; 3. https://www.google.com/search?client=firefox-b&q=micro+cap+manual 4. https://www.google.com/search?client=firefox-b&q=pspice+manual+9.1; |
| **Organisational unit conducting the course** | Department of Electrotechnics, Power Electronics and Power Engineering | **Date of issuing the programme** |
| **Author of the programme** | **Jaroslaw Makal, Ph.D. Eng.** | **03.01.2023** |

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

**S – seminar**