Subject card

| Subject name and code | Electric Circuit II, PG_00038390 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Field of study | Electrical Engineering |  |  |  |  |  |  |
| Date of commencement of studies | October 2020 |  | Academic year of realisation of subject |  |  | 2020/2021 |  |
| Education level | first-cycle studies |  | Subject group |  |  | Obligatory subject group in the field of study <br> Subject group related to scientific research in the field of study |  |
| Mode of study | Part-time studies |  | Mode of delivery |  |  | e-learning |  |
| Year of study | 1 |  | Language of instruction |  |  | Polish |  |
| Semester of study | 2 |  | ECTS credits |  |  | 5.0 |  |
| Learning profile | general academic profile |  | Assessment form |  |  | exam |  |
| Conducting unit | Faculty of Electrical and Control Engineering |  |  |  |  |  |  |
| Name and surname of lecturer (lecturers) | Subject supervisor |  | dr inż. Joanna Wołoszyn |  |  |  |  |
|  | Teachers |  | dr inż. Joanna Wołoszyn |  |  |  |  |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Proje | Seminar | SUM |
|  | Number of study hours | 20.0 | 20.0 | 0.0 | 0.0 | 0.0 | 40 |
|  | E-learning hours included: 40.0 |  |  |  |  |  |  |
|  | Adresy na platformie eNauczanie: |  |  |  |  |  |  |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan |  | Participation in consultation hours |  | Self-study | SUM |
|  | Number of study hours | 40 |  | 5.0 |  | 80.0 | 125 |
| Subject objectives | Modeling of electrical systems by electrical circuit. Consolidate knowledge about methods analyze a variety of electrical circuits. Understanding the phenomena in electrical systems on the basis of circuit models. |  |  |  |  |  |  |
| Learning outcomes | Course outcome |  | Subject outcome |  |  | Method of verification |  |
|  | K6_K05 |  | can react in emergency situations when using electrical devices |  |  | [SK5] Assessment of ability to solve problems that arise in practice |  |
|  | K6_W03 |  | knows methods of solving single and three-phase AC circuits. |  |  | [SW3] Assessment of knowledge contained in written work and projects |  |
|  | K6_U04 |  | can solve tasks from single and three-phase AC circuits. |  |  | [SU4] Assessment of ability to use methods and tools |  |
| Subject contents | Single-phase alternating current circuits in steady state: the complex numbers in the analysis of AC circuits, phasor diagrams of voltages and currents, the analysis of two-terminal elements (RLC serial connections, parallel and mixed). Active and reactive power, power factor, power triangle. Analysis of complex AC circuits, calculation of power balance. Resonance in electrical circuits. Magnetic coupling, mutual inductance. Ferromagnetic core transformer - principle of operation and the equivalent circuit. Passive filters - amplitude frequency characteristics. Three-phase AC circuits in steady state: three-phase circuits symmetrical and asymmetrical, three-phase load connected in star and delta. Power in three-phase circuits. |  |  |  |  |  |  |
| Prerequisites and co-requisites | Knowledge of the subject Mathematics and knowledge of the subject Electrical circuits I |  |  |  |  |  |  |
| Assessment methods and criteria | Subject passing criteria |  | Passing threshold |  |  | Percentage of the final grade |  |
|  | The written examination |  | 50.0\% |  |  | 60.0\% |  |
|  | Midterm colloquium |  | 50.0\% |  |  | 40.0\% |  |


| Recommended reading | Basic literature | 1. Kurdziel R.: Podstawy Elektrotechniki. WNT, Warszawa 1972 <br> 2. Bolkowski S.: Teoria obwodów elektrycznych. WNT Warszawa. <br> 3. Bolkowski S. . i in. : Zbiór zadań z elektrotechniki teoretycznej. WNT Warszawa. <br> 4. Horiszny J. i in. : Obwody elektryczne w stanie ustalonym. Zbiór zadań. Wydawnictwo PG. Gdańsk 2005 |
| :---: | :---: | :---: |
|  | Supplementary literature | 1. Mikołajuk K., Trzaska Z.: Elektrotechnika teoretyczna - analiza i synteza elektrycznych obwodów liniowych. PWN Warszawa. <br> 2. Cichocki A. i in. : Zbiór zadań z elektrotechniki teoretycznej. PWN Warszawa |
|  | eResources addresses |  |
| Example issues/ example questions/ tasks being completed | The calculation of the currents in the DC circuit. Calculation of currents in the AC circuit. Calculation of the power of circuit components. The adjustment of the circuit parameters to achieve a specific desired value of the given output parameter of the circuit. The calculation of currents and voltages in a circuit with the loads of the given nominal values. Determination of the resonant frequency of the circuit. Determination of the amplitude characteristics of the passive filter. The calculation of currents and voltages in a circuit with a transformer. Calculate the current in the symmetrical 3-phase circuit. |  |
| Work placement | Not applicable |  |

