**SYLLABUS**

**regarding the qualification cycle FROM 2024TO 2025**

1. Basic Course/Module Information

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| --- | --- |
| Course/Module title | **Modern electrotechnologies** |
| Course/Module code \* |  |
| Faculty (name of the unit offering the field of study) | *College of Natural Sciences* |
| Name of the unit running the course | *Institute of Materials Engineering* |
| Field of study | **MECHATRONICS** |
| Qualification level  | FIRST-CYCLE STUDIES |
| Profile | *PRACTICAL* |
| Study mode | *FULL-TIME STUDIES* |
| Year and semester of studies | *YEAR 2, SEMESTER 4* |
| Course type | *LABORATORIES* |
| Language of instruction | ENGLISH |
| Coordinator | *ANNA KOZIOROWSKA, PhD, DSc., Eng.* |
| Course instructor | *ANNA KOZIOROWSKA, PhD, DSc., Eng.* |

\* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester(n0.) | Lectures | Classes | Colloquia | Lab classes | Seminars | Practical classes | Internships | others | **ECTS credits**  |
| 4 |  |  |  | 30 |  |  |  |  | 5 |

1.2. Course delivery methods

- conducted in a traditional way

- involving distance education methods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)

Pass

2. Prerequisites

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| BASIC KNOWLEDGE OF THE FUNDAMENTALS OF ELECTROMAGNETISM, CIRCUIT THEORY AND PHYSICS. |

3. Objectives, Learning Outcomes, Course Content, and Instructional Methods

3.1. Course/Module objectives

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| --- | --- |
| O1 | To introduce students to the issues of the use of electrotechnology, e.g. in medical therapy and diagnostics. |
| O2 | The use of phenomena from the field of laser techniques, electric and magnetic fields, ultrasounds and microwaves used in therapy and medical diagnostics. |
| O3 | Developing the skills of applying appropriate measuring methods to various electrical devices applicable in medical devices. |

3.2. Course/Module Learning Outcomes (to be completed by the coordinator)

|  |  |  |
| --- | --- | --- |
| Learning Outcome | The description of the learning outcome defined for the course/module | Relation to the degree programme outcomes |
| LO\_01 | KNOWLEDGE: Knows the classification of electrotechnological devices - knows what electrotechnological devices are used for.Understands physical phenomena used in the operation of electrotechnological devices. |  |
| LO\_02 | SKILLS: Selects the right measuring methods for the appropriate devices.Correctly verifies and interprets the obtained measurement test results. |  |
| LO\_03 | SOCIAL COMPETENCES: Define priorities for the implementation of tasks, can work in a group. |  |

**3.3. Course content (to be completed by the coordinator)**

1. Classes, tutorials/seminars, colloquia, laboratories, practical classes

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| Content outline  |
| Introduction, health and safety rulesEducational station for testing security systems for medical devicesMeasuring the electromagnetic field around selected devicesApplication of devices used in physiotherapyPass |

3.4. Methods of Instruction

LABORATORY - WORK IN GROUPS, CONNECTING CIRCUITS AND TAKING MEASUREMENTS, ANALYSIS OF EXAMPLES, DISCUSSION.

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

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| --- | --- | --- |
| Learning outcome | Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes) | Learning format (lectures, classes,…) |
| LO-01 | *OBSERVATION, DISCUSSION, PP PRESENTATION (WRITTEN EXAM)* | LABORATORY |
| LO-o2 | *OBSERVATION DURING LABORATORIES, REPORT (TEST)* | LABORATORY |
| LO-o3 | *OBSERVATION DURING LABORATORIES, RAPORT (TEST)* | LABORATORY |

4.2 Course assessment criteria

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| Laboratory: positive evaluation of tests and assessment of homework (raports) and activity during classes. |

5. Total student workload needed to achieve the intended learning outcomes

– number of hours and ECTS credits

*OBSERVATION DURING CLASSES*

|  |  |
| --- | --- |
| Activity | Number of hours |
| Scheduled course contact hours | 30 |
| Other contact hours involving the teacher (consultation hours, examinations) | 10 |
| Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.) | 85 |
| Total number of hours | 125 |
| Total number of ECTS credits | 5 |

\* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

|  |  |
| --- | --- |
| Number of hours |  |
| Internship regulations and procedures |  |

7. Instructional materials

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| Compulsory literature: * + - 1. [Theraja](https://www.amazon.com/B-L-Theraja/e/B00IY5H6AU/ref%3Ddp_byline_cont_book_1) B.L. Textbook of Electrical Technology, ISBN-13 978-8121924412, 2008
			2. Fundamentals of Electrical Engineering I, open texbooks, The Open University of Hong Kong (pdf available on the internet)
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| Complementary literature: Materials sent by the teacher during the classes. |

Approved by the Head of the Department or an authorised person