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| 1. | Field of study | Materials Science and Engineering |
| 2. | Faculty | Faculty of Science and Technology |
| 3. | Academic year of entry | 2023/2024 (winter term), 2024/2025 (winter term) |
| 4. | Level of qualifications/degree | first-cycle studies (in engineering) |
| 5. | Degree profile | general academic |
| 6. | Mode of study | full-time |

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| 7. General information about the module | |
| Module name | Materials Testing Methods 2 |
| Module code | IM1A_MBM_2 |
| Number of the ECTS credits | 6 |
| Language of instruction | |
| Purpose and description of the content of education | The Materials Research Methods module 2 is intended to enable students to learn the phenomena, principles of operation and construction of test equipment used in measurement techniques and methods used to study the mechanical, electrical and magnetic properties of engineering materials. Thanks to this, students should master the operation of research equipment and acquire the skills to interpret measurement results. Understanding the phenomena and principles of operation is to lead to the skilful application of the appropriate research technique to assess selected properties of engineering materials. |
| List of modules that must be completed before starting this module (if necessary) | not applicable |

| 8. Learning outcomes of the module | | | |
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| Code | Description | Learning outcomes of the programme | Level of competenc (scale 1-5) |
| IM1A_MBM2_1 | Understanding the phenomena used in the methods of testing the mechanical, electrical and magnetic properties of engineering materials; learning about the construction and operation of specialized scientific and research equipment. | IM1A_W05 | 3 |
| IM1A_MBM2_2 | Acquisition of the ability to operate specialized scientific and research equipment; performing simple experiments; interpreting results and evaluating measurement errors. | IM1A_U08 | 3 |
| | | IM1A_W05 | 3 |
| IM1A_MBM2_3 | Ability to use the acquired knowledge to prepare the workplace, perform the assigned task and develop detailed documentation of its implementation. | IM1A_K02 | 3 |
| | | IM1A_U01 | 3 |
| | | IM1A_U03 | 3 |
| | | IM1A_U05 | 3 |
| | | IM1A_U08 | 3 |
| | | IM1A_U10 | 3 |

| 9. Methods of conducting classes | | |
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| Code | Category | Name (description) |
| a01 | Lecture methods / expository methods | Formal lecture/ course-related lecture <i>a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided</i> |
| a05 | Lecture methods / expository methods | Explanation/clarification <i>explication involving the derivation of a predetermined theorem from other, already known ones, in the number of steps specified by the person teaching the course</i> |
| b01 | Problem-solving methods | Problem-based lecture <i>an analysis of a selected scientific or practical problem accompanied by its assessment and an attempt to provide a solution to the issues presented in the lecture as well as the indication of the consequences of the proposed solution</i> |
| b04 | Problem-solving methods | Activating method – discussion / debate <i>an exchange of views supported by substantive arguments leading to a clash of different views, a compromise or the identification of common positions; it proceeds according to previously agreed-upon rules regarding the time, manner and turn-taking as well as the principles of civil discourse; a discussion is not a competition but aims at finding the best solutions or presenting different points of view; its varieties include brainstorming, Oxford-style debate, panel discussion, decision tree, conference discussion; a debate is an orderly dispute between supporters and opponents of a viewpoint, usually specialists in the field or pre-selected representatives of a group dealing with a common problem</i> |
| c06 | Demonstration methods | Demonstration-imitation <i>a presentation of a model way of performing specific activities accompanied by a commentary; it aims at triggering imitation activities in an individual or in a group of participants observing the activities of the person teaching the course until the right habit is formed through regular exercise; the demonstration-imitation method is combined with a physical practice of activities/behaviours</i> |
| c07 | Demonstration methods | Screen presentation <i>a presentation of synthetic image content using computer graphics, e.g., a series of slides or other multimedia forms, usually accompanied by a commentary; typical components of a screen presentation include text organized into bulleted points, charts, images and animations, sometimes sound effects or music; a multimedia illustration of course content presented in the form of a projected image</i> |
| d03 | Programmed learning methods | Working with another teaching tool <i>e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools</i> |
| e01 | Practical methods | Laboratory exercise / experiment <i>[also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment</i> |

| 10. Forms of teaching | | | | | |
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| Code | Name | Number of hours | Assessment of the learning outcomes of the module | Learning outcomes of the module | Methods of conducting classes |
| IM1A_MBM2_fs1 | lecture | 30 | exam | IM1A_MBM2_1 | a01, b01, b04, c07 |
| IM1A_MBM2_fs2 | laboratory classes | 45 | course work | IM1A_MBM2_2, IM1A_MBM2_3 | a05, b04, c06, d03, e01 |

| 11. The student's work, apart from participation in classes, includes in particular: | | | |
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| Code | Category | Name (description) | Is it part of the BUNA? |
| a01 | Preparation for classes | Search for materials and review activities necessary for class participation <i>reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes</i> | No |
| a02 | Preparation for classes | Literature reading / analysis of source materials <i>reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class</i> | No |
| a03 | Preparation for classes | Developing practical skills <i>activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)</i> | No |
| a05 | Preparation for classes | Production/preparation of tools, materials or documentation necessary for class participation <i>developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes</i> | No |
| b01 | Consulting the curriculum and the organization of classes | Getting acquainted with the syllabus content <i>reading through the syllabus and getting acquainted with its content</i> | Yes |
| c02 | Preparation for verification of learning outcomes | Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class</i> | No |
| d01 | Consulting the results of the verification of learning outcomes | Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes <i>reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes</i> | Yes |
| d02 | Consulting the results of the verification of learning outcomes | Development of a corrective action plan as well as supplementary/corrective tasks <i>reviewing and selecting tasks and activities enabling the elimination of errors indicated by the academic teacher, their verification or correction resulting in completing the task with at least the minimum passing grade</i> | Yes |

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: <https://usosweb.us.edu.pl>.