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| FACULTY: | **Faculty of Mechanical and Energy Engineering**  Department of Biomedical Engineering |
| FIELD OF STUDY: | **Biomedical Engineering** |
| ERASMUS COORDINATOR OF THE FACULTY: | Igor Maciejewski, DSc, PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | igor.maciejewski@tu.koszalin.pl |
| COURSE TITLE: | **Biomaterials** |
| LECTURER’S NAME: | Katarzyna Mitura, PhD |
| E-MAIL ADDRESS OF THE LECTURER: | katarzyna.mitura@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 4 |
| ACADEMIC YEAR: | 2024/2025 |
| SEMESTER: (W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 45 |
| LEVEL OF THE COURSE:  (1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:  (lecture, laboratory, group tutorials, seminar, other-what type?) | Lectures and Classes (30h + 15h) |
| LANGUAGE OF INSTRUCTION: | * **English full time scheme for classes with 5 and more International Erasmus+ students enrolled/accepted;** * **English 50% individually with the teacher + Polish 50% with Polish students or individual project work- scheme for classes with less than 5 International Erasmus+ students enrolled/ accepted;** |
| ASSESSMENT METOD:  (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test |
| COURSE CONTENT: | 1. Definitions and classification of biomaterials and studies on implant degradation in biological environment.  2. Biocompatibility studies of biomaterials in contact with surrounding tissues body fluids.  3. Studies on implant degradation in biological environment.  4. In vitro studies on biomaterials - test methods. Standards and legal regulations for animal testing. Clinical tests. Biomaterial certification.  5. Organization and monitoring of clinical tests.  6. Physical, mechanical and biological effects of biomaterials on human organism.  7. Division of biomaterials depending on mechanical, material and biological properties.  8. Division of biomaterials by Hench. Carbon based nanomaterials in medicine (cardiac surgery, trauma and orthopedic surgery, maxilla-facial surgery and invasive cardiology).  9. Risks associated with the use of biomaterials.  10. Selected methods of biomaterial testing - (SEM, XRD); fluorescence microscopy and opitical microscopy (post-mortem examinations of histopathological preparations).  11. The corrosion tests of biomaterials in simulation fluids. |
| ADDITIONAL INFORMATION: | Basic chemistry, physics, mathematics courses completed. Knowledge of basic issues in physics, chemistry and mathematics describing the state of matter. Basic information on materials science.  Code: 0911>1000-Biom |