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| FACULTY: | **Faculty of Mechanical and Energy Engineering** |
| FIELD OF STUDY: | **Biomedical Engineering** |
| ERASMUS COORDINATOR OF THE FACULTY: | Igor Maciejewski |
| E-MAIL ADDRESS OF THE COORDINATOR: | igor.maciejewski@tu.koszalin.pl |
| COURSE TITLE: | **Technical and dental materials science** |
| LECTURER’S NAME: | Witold Gulbiński, Prof, D.Sc. PhD. Mieczysław Pancielejko, D.Sc., PhD Eng. Karolina Kminikowska, PhD Eng |
| E-MAIL ADDRESS OF THE LECTURER: | witold.gulbinski@tu.koszalin.pl mieczyslaw.pancielejko@tu.koszalin.pl  karolina.kminikowska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 6 |

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| COURSE CODE (USOS): | 0911>1000- MTiD |

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| ACADEMIC YEAR: | 2025/2026 |
| SEMESTER:  (W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 60 |
| LEVEL OF THE COURSE:  (1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:  (lecture, laboratory, group tutorials, seminar, other-what type?) | Lecture (30h) Laboratory (30h) |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:  (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written reports/presentation |
| COURSE CONTENT: | The aim of the course is to familiarize students with issues related to engineering materials, in particular the relationship between the structure of metals and their alloys, and the properties and ways of shaping the structure. Issues related to the chemical, physical and mechanical properties of polymers and ceramics used in prosthetic applications and implantology. Students will learn about the properties and application of the main groups of engineering materials in medicine, biomedical and dental engineering.  Fundamentals of the structure of matter. Cold plastic deformation and recrystallization. Phase equilibrium systems. Metastable Fe-Fe3C phase equilibrium system. Foundry iron-carbon alloys - cast irons. Carbon steels. Heat treatment of steels - hardening and tempering. Alloyed steels. Titanium and its alloys. Aluminum and aluminum alloys. Metallic biomaterials. Ceramic materials. Polymers and composites. |
| ADDITIONAL INFORMATION: | Students should know the fundamentals of solid state physics and chemistry. Knowledge of atomic structure and types of chemical bonds is required. |