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| FACULTY: | **Faculty of Mechanical Engineering** |
| FIELD OF STUDY: | **Biomedical Engineering** |
| ERASMUS COORDINATOR OF THE FACULTY: | Igor Maciejewski |
| E-MAIL ADDRESS OF THE COORDINATOR: | [igor.maciejewski@tu.koszalin.pl](mailto:igor.maciejewski@tu.koszalin.pl) |
| COURSE TITLE: | **Mechanics and strength of materials** |
| LECTURER’S NAME: | Łukasz Szparaga, Ph.D |
| E-MAIL ADDRESS OF THE LECTURER: | [lukasz.szparaga@tu.koszalin.pl](mailto:lukasz.szparaga@tu.koszalin.pl) |
| ECTS POINTS FOR THE COURSE:  COURSE CODE (USOS): | 5 0911>1000-LIM |
| ACADEMIC YEAR: | 2022/2023 |
| SEMESTER:  (W – winter, S – summer) | S |
| 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?) | Lectures (30h), Classes (30h) |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:  (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | written exam/project work |
| COURSE CONTENT: | The program content includes: introductory concepts and principles of technical mechanics, general concepts and principles of kinematics, methods of describing the motion of a point, speed and acceleration of a point, complex motion of a point and a solid. General concepts and principles of dynamics, the dynamics of a free and bounded material point. Lagrange's formalism. Dissipative forces, friction. Basic concepts and determination of the strength of materials. Types of loads. External and internal forces and stresses. The concept of deformation. Elements of the theory of elasticity, features of material elasticity, material strength features. Hooke's law for simple stretching. Experimental basis of material strength. The de Saint-Venant principle. Analysis of tangentially determinate and indeterminate bars. Analysis of one-dimensional state of deformation. Bending of straight beams. Bending moment, shear force and continuous load. Moments of inertia and deviation. Steiner formulas. Introduction to energy methods. Castiglian and Menabrea theorem. Differential equations of the beam deflection line. Elastic energy in straight and curved beams. Strength analysis of plates and coatings. Calculation of circularly symmetrical plates and thin-walled shells. |
| ADDITIONAL INFORMATION: | Students should have basic knowledge about mathemathics and physics from previous courses. |