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| FACULTY: | **Faculty of Mechanical 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: | **Electronic medical equipment** |
| LECTURER’S NAME: | Przemysław Ceynowa. Ph. D. Eng. |
| E-MAIL ADDRESS OF THE LECTURER: | przemyslaw.ceynowa@gmail.com |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2021/2022 |
| 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 |
| ASSESSMENT METOD:  (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | exam (written or oral) |
| COURSE CONTENT: | 1. Division and characteristics of therapeutic and diagnostic medical apparatus. 2. Human as a source of biological signals. Methods of receiving biological signals from a human. Characteristics and methods of receiving selected bioelectric signals. 3. Biological object system model - bioelectric signal amplifier. 4. The heart as a source of electrical signal in a volumetric conductor. Electrocardiograph, principle of construction and operation. 5. Electromyography, EMG signal characteristics, electrodes and microelectrodes for recording EMG signals, examples of solutions. 6. The use of spectral methods to calculate the degree of blood oxygenation. Detectors and radiation sources for pulse sensors, construction of pulse meter and pulse oximeter. 7. The use of ultrasound for imaging of internal structures. 8. The use of ultrasound to detect and visualize flows. Description and application of the Doppler phenomenon. 9. The use of x-rays in medical imaging. Computed tomography systems. 10. The phenomenon of atomic magnetic resonance imaging, components of the MRI system. 11. External defibrillators. 12. Low and high frequency current therapy. 13. Digital ECG signal processing. |
| ADDITIONAL INFORMATION: | Knowledge of physics, mathematics and biology in the basic scope of upper secondary school. |