

Course name: Physical bases of instrumental diagnostics and physiotherapy (USOS Code: B-BM.080Eng)

ECTS: 2

No. of hours: 30 (20 lectures + 10 classes)

Course coordinator: Prof. dr hab. Kazimierz Trębacz

Prerequisites: Knowledge of basic principles of physics and human physiology

Course description: Electrocardiography, ECC - physical phenomena in a human heart, principle of measurement, application, data analysis, bases of diagnostics of a circular system, Electrical phenomena in a nervous system. Electroencephalography, EEG, - physical principles, application, data analysis. Ultrasounds - emission, detection, ultrasonography, lithotripsy. Computer tomography, CT - X-radiation, principle of functioning and application of CT. Positron emission tomography, PET - physical bases, principles of design, application in medical diagnosis and behavioural tests. NMR spectroscopy and NMR tomography - physical bases, application, resolution. Scintigraphy - radioactive isotopes, types of radiation, impact of radiation on the human organism, application of scintigraphy. LASER - principle of operation, application in ophthalmology, dermatology, and dentistry. An impact of light on a human body, application of different light sources in therapy and rehabilitation. An influence of temperature on a human organism. Thermography - physical bases, application. An influence of pressure changes on an organism, hyperbaric chambers. Application of light microscopy in diagnostics.

Recommended literature: Hall J.E. 2011. Guyton and Hall Textbook of Medical Physiology Saunders Elsevier; Wilson J.D., Buffa A.J., Lou B. College Physics (7th Edition) Pearson.