



Subject card

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| Subject name and code | Artificial organs for Medical and Mechanical Engineering, PG_00024948 | | | | | | |
| Field of study | Medical and Mechanical Engineering, Medical and Mechanical Engineering | | | | | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | | | | 2022/2023 | |
| Education level | first-cycle studies | Subject group | | | | Optional subject group Subject group related to scientific research in the field of study | |
| Mode of study | Full-time studies | Mode of delivery | | | | at the university | |
| Year of study | 3 | Language of instruction | | | | Polish | |
| Semester of study | 6 | ECTS credits | | | | 3.0 | |
| Learning profile | general academic profile | Assessment form | | | | exam | |
| Conducting unit | Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | Jerzy Lasek | | | | |
| | Teachers | | Jerzy Lasek | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 15.0 | 0.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 30 | | 5.0 | | 40.0 | 75 |
| Subject objectives | The aim of the course is to provide students basic information about the indications and applications of artificial organs in modern medicine, as well as possibilities for solutions in this area in the future. Attention is drawn to biomaterials that are used for artificial organs to replace ailing or even insufficient natural organs. The student should acquire knowledge about the natural elements of artificial organs using omnipotent stem cells. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | |
| | K6_W13 | | The student uses the medical knowledge of the main areas of medicine for the needs of medical engineering. | | | [SW1] Assessment of factual knowledge | |
| | K6_U10 | | Assesses the structure and functioning the human body. | | | [SU1] Assessment of task fulfilment | |
| | K6_K02 | | The student is aware of the importance of the procedure and complies with the rules of ethics. | | | [SK2] Assessment of progress of work | |

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| Subject contents | <p>1. Characteristics of diseases demanding possible application of endoprotheses</p> <p>2. Characteristics of implants applied in the treatment of locomotor system diseases (screws, plates, tension wire band, nails, rods, wires, external stabilizers)</p> <p>3. Endoprotheses of the hip joint, knee, joint, scapulo-humeral joint and elbow joint - presentation of surgical procedures recorded on DVD</p> <p>4. Implants applied in diseases of various systems and organs (vascular stents, heart pacemakers, brain pacemakers, vascular prostheses, biliary tract prostheses and other) - examples of clinical application</p> <p>5. Artificial organs - heart, skin, liver, pancreas, eye, larynx and other</p> <p>6. "Artificial blood" - non-hemoglobin carriers of oxygen</p> <p>7. Perspectives of artificial organs application in future</p> | | |
| Prerequisites and co-requisites | credit of "Selected knowledge in surgery" , "Selected knowledge on orthopaedics". | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| Recommended reading | <p>Written exam</p> <p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p> | <p>50.0%</p> <p>1. W. Noszczyk: Chirurgia, PZWL Warszawa 2005.</p> <p>2. J. Szmidt: Podstawy chirurgii, Medycyna Praktyczna Kraków, 2009</p> <p>3. T. Tylman: Traumatologia narządu ruchu, PZWL Warszawa, 1985.</p> <p>4. P. Ruedi et al: AO principles of Trauma Management, AO Publishing, Thieme, Davos, 2008.</p> <p>5. W.C. de Vries: The artificial heart. Clinical Symposia, vol. 35,6, 1983</p> <p>6. G. Woo: Artificial organs produce genuine benefits. Med.Dev.Diagn.Industry Mag., 1-6, 1998.</p> <p>L. Brongel, J.Lasek, K. Słowiński: Podstawy chirurgii urazowej, Wyd. Med. Kraków, 2008.</p> | <p>100.0%</p> |
| Example issues/ example questions/ tasks being completed | | | |
| Work placement | Not applicable | | |