GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Diagnostic techniques in medicine, PG_00065009 | | |
| Field of study | Mechanical and Medical Engineering | | |
| Date of commencement of studies | February 2025 | Academic year of realisation of subject | 2024/2025 |
| Education level | second-cycle studies | Subject group | Obligatory subject group in the field of study<br>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 | 1 | Language of instruction | Polish |
| Semester of study | 1 | ECTS credits | 2.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | Michał Penkowski | |
| | Teachers | | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 15.0 | 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 | 6.0 | 14.0 | 50 |

**Subject objectives**

The aim of the course is to broaden students' knowledge of the main diagnostic techniques used in medicine.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_W02] has structured and well-founded knowledge covering fundamental issues in the field of medical sciences allowing to design medical devices, rehabilitation systems and to formulate research procedures | The student has in-depth knowledge of diagnostic techniques used in medicine. | [SW1] Assessment of factual knowledge |
| [K7_U14] integrates information obtained from literature and other properly selected sources, including those in a foreign language, creatively interpreting and critically evaluating them, and drawing conclusions | The student has the ability to prepare and deliver presentations in the field of diagnostic techniques. | [SU2] Assessment of ability to analyse information<br>[SU1] Assessment of task fulfilment |
| [K7_K13] is ready for responsible performance of proffesional roles, considering ever-changing need of the society, including self developement and supporting and fullfiling work ethics | The student understands the non-technical aspects of the activities of a mechanical engineer and the need to comply with the principles of professional ethics. | [SK3] Assessment of ability to organize work<br>[SK1] Assessment of group work skills |

**Subject contents**

Theory and technique of CT. Specific applications of CT. Types of blood tests. PET construction. PET scan. Magnetic resonance imaging and its application in diagnostics. The use of diagnostic ultrasonography. Types of transducers, types of presentation, Doppler effect. Electromyography and nerve conduction studies. Endoscopy, laparoscopy, uteroscopy, cystoscopy, gastroscopy, colonoscopy. Elementary analysis of the elements of the body. Intake analysis, calorimetry. Detection of toxins and chemical warfare agents. Identification of bacterial pathogens.

**Prerequisites and co-requisites**

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Presentation | 60.0% | 50.0% |
| Test | 60.0% | 50.0% |

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|---|---|---|
| Recommended reading | Basic literature | 1. J. Szabatin. Podstawy teorii sygnałów. WKŁ Warszawa 2003.<br>2. Problemy biocybernetyki i inżynierii biomedycznej pod red. M. Nałęcza. T.2. Biopomiary. WKiŁ Warszawa 1990.<br>3. Podstawy biofizyki pod red. A. Pilawskiego. PZWL Warszawa 1985. |
| | Supplementary literature | 1. S. W. Smith. Cyfrowe przetwarzanie sygnałów. Praktyczny poradnik dla inżynierów i naukowców. BTC, Warszawa, 2003.<br>2. A. Straburzyńska-Lupa, G. Straburzyński. Fizjoterapia. PZWL Warszawa 2003.<br>3. J. Ross Macdonald. Impedance spectroscopy. Wiley-Interscience 2005. |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | 1. Description and explanation of CT.<br>2. Types of blood testing<br>3. Types of transducers<br>4. Doppler effect<br>5. Uteroscopy | |
| Work placement | Not applicable | |

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