# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

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| Subject name and code | Fundamentals of Machine Design I, PG_00038858 |
| Field of study | Medical and Mechanical Engineering, Mechanical and Medical Engineering |

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| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2021/2022 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study |
| | | | 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 | 2 | Language of instruction | Polish |
| Semester of study | 4 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |

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| Conducting unit | Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology |

| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Rafał Gawarkiewicz |
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| | Teachers | dr inż. Rafał Gawarkiewicz |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 15.0 | 15.0 | 0.0 | 0.0 | 45 |
| | E-learning hours included: 0.0 | | | | | | |
| | Adresy na platformie eNauczanie: Podstawy konstrukcji maszyn I - L, IMM, I st., sem. V, zima 2021-22 (M:31639W0) - Moodle ID: 22604 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22604 | | | | | | |

| 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 | 45 | 3.0 | 52.0 | 100 |

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| Subject objectives | Presenting principles of designing basic elements used in the mechanical systems. Acquainting with computational models of typical joints utilised in the machine designing. |

| Learning outcomes | | Course outcome | Subject outcome | Method of verification |
|---|---|---|---|---|
| | | K6_W07 | Student draws engineering drawings with the help of the CAD software. | [SW2] Assessment of knowledge contained in presentation |
| | | K6_U07 | Student identifies phenomena in elements of machines. Student analyses and selects suitable computational models of separable and inseparable joints. | [SU1] Assessment of task fulfilment |
| | | K6_W09 | Student draws engineering drawings with the help of the CAD software. | [SW2] Assessment of knowledge contained in presentation |
| | | K6_U05 | Student identifies phenomena in elements of machines. Student creates computational models used in machine design. Student analyses and selects suitable computational models of separable and inseparable joints. Student identifies loadings and stress states at critical places of analysed machine elements and estimates their safety. | [SU1] Assessment of task fulfilment |
| | | K6_U08 | Student identifies phenomena in elements of machines. Student creates computational models used in machine design. Student analyses and selects suitable computational models of separable and inseparable joints. Student identifies loadings and stress states at critical places of analysed machine elements and estimates their safety. | [SU1] Assessment of task fulfilment |

| Subject contents | Lecture and tutorials: elements of machine science and the theory of the design. Shaping machine elements using strength criteria - engineering methods. Safety coefficient and evaluation of permissible stress. Joints (welded, bolted) and hub-journal assembly. Laboratory: introduction to computer graphic. Familiarisation with CAD software in the range of creating 2D and 3D drawings. |
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| Prerequisites and co-requisites | Mathematics, Physics, Engineering graphics, Mechanics, Strength of materials, Materials science, Technology of the mechanical engineering, Metrology, Machine science |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
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| | CAD laboratory | 50.0% | 10.0% |
| | Tests of the qualifying: classes and lecture | 50.0% | 90.0% |

| Recommended reading | Basic literature | 1. Siwek B.: Połączenia spawane, zgrzewane, lutowane i klejone - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.<br><br>2. Maciakowski R.: Połączenia śrubowe - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.<br><br>3. Maciakowski R., Majewski W.: Połączenia wału z piastą - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.<br><br>4. Kochanowski M.: Podstawy konstrukcji maszyn z rysunkiem technicznym. Wyd. Politechniki Gdańskiej, Gdańsk 1998. |
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| | Supplementary literature | 1. Podstawy Konstrukcji Maszyn. The serie of monographs issued by PWN.<br><br>2. Any studies dedicated to computer aided systems: AutoCAD, Inventor i SolidWorks for any software version. |
| | eResources addresses | Podstawy konstrukcji maszyn I - L, IMM, I st., sem. V, zima 2021-22 (M:31639W0) - Moodle ID: 22604<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22604 |

| Example issues/ example questions/ tasks being completed | To check/assess the safety of the element/set of elements or/and connections used in it/them... |
| --- | --- |
| | To determine/estimate dimensions or max loading of the element/set of elements, or used joint/-s in it/them... |
| | Welded joints - to describe computational models for butt and fillet weld indicating differences between them. |
| | Motionless bolted joints - to describe computational models with indicating differences between them. |
| | Hub-journal couplings - to discuss characteristic features and the range of their applications. To describe computational models for three chosen couplings indicating differences between them. |
| Work placement | Not applicable |