GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Material Removal Processes, PG_00039869 | | |
| Field of study | Mechanical Engineering, Mechanical Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2020/2021 |
| Education level | first-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 | 2 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | exam |
| Conducting unit | Department of Manufacturing and Production Engineering -> Faculty of Mechanical Engineering and Ship Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Wojciech Blacharski | |
| | Teachers | dr inż. Wojciech Blacharski<br>dr hab. inż. Daniel Chuchała<br>dr inż. Aleksandra Suchta | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 30.0 | 0.0 | 15.0 | 0.0 | 0.0 | 45 |

E-learning hours included: 0.0

Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10122
Adresy na platformie eNauczanie:
Obróbka Skrawaniem: W/L; MiBM 1 stopień, 2 semestr (M:31534W0): Lato 2021 - Moodle ID: 10122
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10122

**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 | 6.0 | 49.0 | 100 |

**Subject objectives**

Giving basic knowledge concerning manufacturing technologies with special consideration to cutting processes and machine tools.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle | The student describes the basic methods of machining, their technological possibilities and applications. | [SW1] Assessment of factual knowledge |
| [K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials | The student describes the properties of materials for cutting tool blades and the principles of their selection for machining tasks. | [SW1] Assessment of factual knowledge |
| [K6_U04] is able to perform a critical analysis of the existing technical solutions, present the specification of the technology of manufacturing basic construction elements of machines and engineering assemblies | Student characterizes physical phenomena during cutting processes and their influence on the course of machining. | [SU3] Assessment of ability to use knowledge gained from the subject |

<table>
<tr><td>Subject contents</td><td>LECTURE Geometric and kinematic parameters of cutting. Movements of tools and workpieces during machining. Geometry of a cutting tool analysed in tool-in-hand system and in tool-in-use system. Geometry of cut. A phenomeon of chip formation and kinds of chips. Heat and temperature in cutting area. Coolant and lubricant agents. Wear of cutting tools. Quality of the surface after machining. Force and power during machining. Vibrations during cutting. Tool materials and rules of their selection. Basic ways of cutting: turning, milling, drilling, deepening, boring. Abrasive machining. Structure of abrasive tools: abrasive grains, bonds, principles of selecting grinding wheels. Wear processes and ways of dressing the grinding wheels. LABORATORY Parting-off materials and machine-tools for cutting-off. Machining on lathes. Machining on drilling machines. Machining on milling machines. Machining of toothed gear-wheels. Machining on grinding machines. Cutting on planning machines and vertical shapers.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of machinery and machine parts, materials and strength of materials.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Final test</td><td>50.0%</td><td>90.0%</td></tr>
<tr><td>Laboratory exercises</td><td>100.0%</td><td>10.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Olszak W. Obróbka skrawaniem. WNT Warszawa 2008. Grzesik W.: Podstawy skrawania materiałów metalowych. WNT warszawa 1998. Jemielniak K.: Obróbka skrawaniem. Ofic. Wyd. Polit. Warsz. Warszawa1998. Cichosz P.: Narzędzia skrawające. WNT, Warszawa 2006. Bartosiewicz J.: Obróbka skrawaniem i elementy obrabiarek. Wyd. Poilt. Gda. Gdańsk 1997.</td></tr>
<tr><td>Supplementary literature</td><td>Internet - selected web pages of manufacturers of cutting tools.</td></tr>
<tr><td>eResources addresses</td><td>Obróbka Skrawaniem: W/L; MiBM 1 stopień, 2 semestr (M:31534W0): Lato 2021 - Moodle ID: 10122<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10122</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Final test consists of many questions that are related to all subsubjects.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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