



Subject card

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|---|---|--|--|-------------------------------------|--|------------|-----|
| Subject name and code | Tooling of Manufacturing Systems, PG_00050175 | | | | | | |
| Field of study | Mechanical Engineering, 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 | Part-time studies | | Mode of delivery | | at the university | | |
| Year of study | 3 | | Language of instruction | | Polish | | |
| Semester of study | 6 | | ECTS credits | | 4.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Zaklad Technologii Maszyn i Automatyzacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Piotr Sender | | | | |
| | Teachers | | dr inż. Piotr Sender | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 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 | | 8.0 | | 62.0 | 100 |
| Subject objectives | The role of instrumentation in manufacturing systems. Principles of instrumentation design. Machining, tool and assembly holders. Equipment for transport, manipulators and robots. Principles of computer-aided design and management of workshop aids. Principles of using universal and modular handles. Tooling costs. | | | | | | |
| 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 | | Principles of using modular handles and designing special handles. The role of tooling and instrumentation in transport systems. | | [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions | | Principles of use and design of universal handles. | | [SU5] Assessment of ability to present the results of task | | |
| Subject contents | LECTURE: The role of tooling in the machine parts manufacturing system. Errors affecting the accuracy of execution in the fixtures. Arrangement the workpieces in the fixtures. Fixing the workpieces in the fixtures. Fixing and mounting the fixturing equipment in the machine tool. Rules for designing of fixtures: lathe fixtures, drill fixtures, milling fixtures, modular fixtures. Tool holders. Fixing accessories. Equipment for transport, manipulators and robots. Principles of computer design and management of workshop aids. principles of using universal fixtures. Tooling costs. Calculation of clamping forces. LABORATORY (computer): Acquisition of the ability to apply the principles of basing and fixing workpieces in fixtures in practice and designing a machining fixtures for the indicated operation. | | | | | | |
| Prerequisites and co-requisites | Knowledge in the field of preparing of construction and machine technology's drawings. | | | | | | |

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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Written test | 60.0% | 50.0% |
| | Design of fixture | 60.0% | 50.0% |
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| Recommended reading | Basic literature | Feld M.: Machining fixtures. WNT, Warssaw, 2002.Dobrzański T.: Machining fixtures. Constructor's guide., WNT,Warszawa, 1987.Standards | |
| | Supplementary literature | Engineer's handbook. Machining. Volume I-III, WNT, Warsaw 1993. Manufacturers Catalogs. Studying studies (books, presentations, lectures) from Polish and foreign technical universities. | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
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| Example issues/ example questions/ tasks being completed | Describe fixture used on lathes and milling machines. Describe ways to calculate fixturing forces. List the principles of construction of turning and milling machining equipment. | | |
| Work placement | Not applicable | | |