



Dofinansowane przez Unię Europejską



COURSE SPECIFICATION

| Course code | full-time programme: M#2-S1-ME-KWW-412 | | | | | |
|----------------------------|--|--|--|--|--|--|
| | part-time programme: | | | | | |
| Course title in Polish | Obróbka skrawaniem | | | | | |
| Course title in English | Machining | | | | | |
| Valid from (academic year) | 2024/2025 | | | | | |

GENERAL INFORMATION

| Programme of study | MECHANICAL ENGINEERING |
|------------------------|---|
| Level of qualification | first-cycle |
| Type of education | academic |
| Mode of study | full-time programme |
| Specialism | Computer-Aided Manufacturing |
| Department responsible | Department of Machine Design and Machining |
| Course leader | dr inż. Michał Skrzyniarz |
| Approved by | dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering |

COURSE OVERVIEW

| Course type | | specialism-related | | | | |
|-------------------------------|---------------------|--------------------|--|--|--|--|
| Course status | | compulsory | | | | |
| Language of instruction | | English | | | | |
| Semester of | full-time programme | Semester IV | | | | |
| delivery | part-time programme | | | | | |
| Pre-requisites | | | | | | |
| Examination required (YES/NO) | | NO | | | | |
| ECTS value : | | 3 | | | | |

| Mode of instruction | | lecture | class | laboratory | project | seminar |
|---------------------|------------------------|---------|-------|------------|---------|---------|
| No. of hours | full-time programme | 15 | | 30 | | |
| per semester | part-time programme | | | | | |

LEARNING OUTCOMES







Fundusze Europejskie dla Rozwoju Społecznego



Rzeczpospolita Polska Dofinansowane przez Unię Europejską



| Category of outcome | Outcome code | Course learning outcomes | Corresponding programme outcome code | | | |
|---------------------|-----------------|---|--|--|--|--|
| Knowledge | W01 | The student has in-depth knowledge of tool materials and their manufacturing methods. They understand the basic issues related to manufacturing technology: cutting methods (kinematics, technological capabilities, and tools). | MiBM1_W06 MiBM1_W07 | | | |
| Knowledge | W02 | The student knows the methods of designing a technological process. The student has detailed knowledge related to of selected issues of manufacturing technology of basic machine elements. | MiBM1_W09 MiBM1_W11 | | | |
| Skills | U01 | The student will be able to apply their knowledge of material selection and fabrication. Select cutting methods, tools and tooling materials to produce a given part. Select appropriate manufacturing technologies to shape products, their structure and properties. | MiBM1_U02 MiBM1_U04 | | | |
| | U02 | The student will be able to obtain information from literature and design a simple technological process. The student will be able to use basic concepts and quantities in the field of machining that are found in books, journals, tool catalogues, materials from machine tool companies. | MiBM1_U03 MiBM1_U08 | | | |
| Competence | K01 | K01 The student is prepared to critically evaluate knowledge and the need to improve professional qualifications, including learning new trends in materials processing. He/she is able to actively participate in the solution of problems and to develop and extend competences independently. | | | | |

COURSE CONTENT

| Type of | |
|-------------|--|
| instruction | Topics covered |
| lecture | |
| lecture | Classification of machining operations. Use of machining in modern manufacturing processes. Geometrical and material properties of the cutting edge. Physical aspects of machining. Mechanics of the cutting process. Forces in the cutting process. Energy and power of cutting. Chip retraction and breakage. Vibrations in the cutting process. Heat in the cutting process. Methods of determining the temperature in the cutting zone. Role and functions of cutting fluids. Wear and blade life. Machinability of engineering materials. Machining techniques: turning, drilling, reaming and boring, cylindrical and face milling. Threading methods. Overview of cutting methods. Principles of abrasive machining. Characteristics and wear of abrasive materials and tools. Grinding, honing, tumbling, lapping and polishing. |
| laboratory | Influence of selected technological parameters of machining on selected parameters of geometric structure of the surface. Investigation of the following processes: drilling, reaming, boring, threading and internal threading and thermo-drilling. Measurement of temperatures during the cutting process. Insert positioning errors in a multi-tool body and their influence on the cutting process. Blade wear and life studies. Measurement of cutting forces. Vibrations in the cutting process. |



Projekt "Dostosowanie kształcenia w Politechnice Świętokrzyskiej do potrzeb współczesnej gospodarki" nr FERS.01.05-IP.08-0234/23







Dofinansowane przez Unię Europejską



ASSESSMENT METHODS

| Outcome code | Methods of assessment (Mark with an X where applicable) | | | | | | | | | |
|-----------------|---|---------------------|------|---------|--------|-------|--|--|--|--|
| | Oral examination | Written examination | Test | Project | Report | Other | | | | |
| W01 | | Х | Х | | Х | | | | | |
| W02 | | Х | Х | | Х | | | | | |
| U01 | | | | | Х | | | | | |
| U02 | | | | | Х | | | | | |
| K01 | | | | | Х | Х | | | | |

ASSESSMENT TYPE AND CRITERIA

| Mode of instruction | Assessment type | Assessment criteria |
|------------------------|-------------------------------|---|
| lecture | non-examination assessment | The pass mark is a minimum of 50% for the final in-class test. |
| laboratory | non-examination assessment | The overall mark for the course is the arithmetic mean of all component marks for the post-lab reports. |

OVERALL STUDENT WORKLOAD

| ECTS weighting | | | | | | | | | | | | |
|----------------|--|------------------------|------------------|----|---|------------------------|---|------|----|------|------|---|
| | | | Student workload | | | | | | | | | |
| No. | Activity type | full-time programme | | | | part-time programme | | | | | | |
| 4 | Schodulad contact hours | L | С | Lb | Ρ | S | L | С | Lb | Ρ | S | h |
| 1. | Scheduled contact hours | 15 | | 30 | | | | | | | | n |
| 2. | Other contact hours (office hours, examination) | 2 | 2 2 | | | | | | | | h | |
| 3. | Total number of contact hours | | 49 | | | | | | | | h | |
| 4. | Number of ECTS credits for contact hours | 2,0 | | | | | | | | | ECTS | |
| 5. | Number of independent study hours | | 26 | | | | | | | | | h |
| 6. | Number of ECTS credits for independent study hours | | 1,0 | | | | | | | | ECTS | |
| 7. | Number of practical hours | | 50 | | | | | | | | h | |
| 8. | Number of ECTS credits for practical hours | 2,0 | | | | | | | | ECTS | | |
| 9. | Total study time | | 75 | | | | | | | h | | |
| 10. | ECTS credits for the course 1 ECTS credit = 25-30 hours of study time | 3 | | | | | | ECTS | | | | |

READING LIST









Rzeczpospolita Polska Dofinansowane przez Unię Europejską



- 1. Olszak W.: Obróbka skrawaniem. WNT Warszawa 2008
- 2. Grzesik W.: Podstawy skrawania materiałów konstrukcyjnych. WNT Warszawa 2010
- 3. Cichosz P.: Narzędzia skrawające. WNT Warszawa 2006
- 4. Oczoś K., Porzycki J.: Szlifowanie. Podstawy i technika. WNT Warszawa 1986
- 5. Przybylski L.: Strategia doboru warunków obróbki współczesnymi narzędziami. Wyd. Politechniki Krakowskiej 2000
- 6. Filipowski R., Marciniak M.: Techniki obróbki mechanicznej i erozyjnej. Oficyna Wydawnicza Politechniki Warszawskiej 2000
- Erbla J, Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, t. II, Obróbka skrawaniem, montaż, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001
- Erbla J, Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, t. II, Obróbka skrawaniem, montaż, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001

