



COURSE SPECIFICATION

Course code	M#1-S1-MiBM-403
Course title in Polish	Podstawy Obróbki Ubytkowej
Course title in English	Fundamentals of Machining
Valid from (academic year)	2019/2020

GENERAL INFORMATION

Programme of study	MECHANICAL ENGINEERING
Level of qualification	first-cycle
Type of education	academic
Mode of study	full-time
Specialism	all
Department responsible	Department of Manufacturing Engineering and Metrology
Course leader	Prof. dr hab. inż. Czesław Kundera
Approved by	

COURSE OVERVIEW

Course type	basic
Course status	compulsory
Language of instruction	English
Semester of delivery	semester 4
Pre-requisites	Machine Technical Drawing, Physics, Metallurgy
Examination required (YES/NO)	YES
ECTS value	5

Mode of instruction	lecture	class	laboratory	project	seminar
No. of hours per semester	30		30		

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Has detailed and in-depth knowledge of machine parts manufacturing techniques, including subtractive and non-waste techniques, methods of bonding materials, taking into account additive and laser technologies, rapid prototyping and reverse engineering, also has a structured and in-depth knowledge of the subject of construction of various types of systems for processing and shaping materials.	MiBM_W10
	W02	Has detailed knowledge related to selected issues in the field of machine construction, production technology of basic elements of machines and devices, their operation, evaluation of operational properties and wear, diagnosis of the technical condition, technology for right and safe use.	MiBM1_W15
Skills	U01	Is able to develop documentation regarding the implementation of an engineering task in the field of mechanics and machine construction, prepare a text containing a discussion of the results of this task	MiBM1_U04
	U02	He can design a simple technological process in the field of mechanics and machine construction and select appropriate machines and devices for this purpose.	MiBM1_U08
Competence	K01	Is aware of the responsibility for their own work, understands the need to submit to the rules of working in a team and be responsible for jointly performed tasks.	MiBM1_K04

COURSE CONTENT

Type of instruction*	Topics covered
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lecture	<ol style="list-style-type: none"> 1. General characteristics of technological machines. Functional and structural system of machines for subtractive processing. 2. Mechanisms and elements of machine tools. 3. Drives and controls used in machine tools. 4. Review of sections and groups of machine tools. Construction, technological possibilities and the use of lathes and milling machines. 5. Construction, technological possibilities and application of planers, slotters and broaching machines. 6. Construction, technological possibilities and application of grinders and superfinishers. 7. Construction, technological possibilities and application of machine tools for processing windings and gears 8. Construction, technological possibilities and application of erosion machine tools. 9. Construction, technological possibilities, application and programming of CNC machine tools. Computer-aided manufacturing. 10. The importance and role of subtractive processing in production processes. The essence of machining and abrasive machining, erosive and hybrid machining, methods of material machining. Development directions of subtractive machining. 11. Basic technological, geometric and kinematic concepts and quantities characterizing the machining and abrasive machining process. The relationship between machining and technological quality of products. 12. Modern cutting tools for processing materials. Modern cutting edge materials and development trends in tool design. 13. Methods and application of machining in the production of machine parts and devices: turning, milling, drilling and reaming, broaching. High-speed machining 14. Methods and application of abrasive machining in the production of machine parts and devices: grinding, honing, oscillating superfinishing and lapping. 15. Production and technological process. The structure of the technological process. Input data for the design of the technological process. Designing the technological process of parts such as shaft, sleeve and gear.
laboratory	<ol style="list-style-type: none"> 1. Familiarizing students with the organization of work in the laboratory and the principles of health and safety. Presentation of the conditions and method of passing the laboratory. 2. Construction of conventional and CNC lathes. Methods of shaping parts using turning. Machining of external surfaces - metrological measurements 3. Methods of machining internal surfaces on lathes - metrological measurements. 4. Construction of conventional and CNC milling machines. Methods of shaping parts using milling. Milling flat surfaces. 5. Milling the contours - measurements of the geometrical features of the model. 6. Milling of slots and grooves for inlets with the use of a dividing head. 7. Making holes by drilling. 8. Boring and reaming holes. 9. Construction of grinders. Surface grinding - surface layer measurements. 10. Construction of grinders. Grinding of shafts and holes. 11. Sharpening turning tools. 12. Sharpening rotary tools. 13. Tool clamping systems. 14. Completion of the course

*) Please delete rows in the table above that are not applicable.

ASSESSMENT METHODS

Outcome code	Methods of assessment Lecture <i>(Mark with an X where applicable)</i>					
	Oral examination	Written examination	Test	Project	Report	Other
W01		X				
W02		X				

U01		X				
U02		X				
K01						X

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

ASSESSMENT TYPE AND CRITERIA

Mode of instruction*	Assessment type	Assessment criteria
lecture	examination assessment	Class attendance, minimum 2/3 attendance. Passing written exam.
laboratory	examination assessment	Class attendance, minimum 2/3 attendance. Obtaining a minimum of 50% of two final tests and submission and completion of all practical reports

*) Please delete rows in the table above that are not applicable.

OVERALL STUDENT WORKLOAD

ECTS weighting							
	Activity type	Student workload					Unit
		L	C	Lab	P	S	
1.	Scheduled contact hours	30		30			h
2.	Other contact hours (office hours, examination)	4		2			h
3.	Total number of contact hours	36					h
4.	Number of ECTS credits for contact hours	1,4					ECTS
5.	Number of independent study hours	89					h
6.	Number of ECTS credits for independent study hours	3,6					ECTS
7.	Number of practical hours	63					h
8.	Number of ECTS credits for practical hours	2,5					ECTS
9.	Total study time	125					h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	5					ECTS

READING LIST

1. Dmochowski J., Podstawy obróbki skrawaniem. PWN, Warszawa 1983.
2. Feld M., Technologia budowy maszyn. PWN, Warszawa 1995.

3. Feld M., Podstawy projektowania procesów technologicznych typowych części maszyn WNT Warszawa 2000.
4. Karpiński T., Inżynieria produkcji, WNT, Warszawa 2004.