



COURSE SPECIFICATION

Course code	M#1-S1-ME-KWW-607
Course title in Polish	Narzędzia skrawające
Course title in English	Cutting Tools
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	Computer-Aided Manufacturing
Department responsible	Department of Manufacturing Engineering and Metrology
Course leader	Łukasz Nowakowski, BEng, PhD
Approved by	

COURSE OVERVIEW

Course type	specialism-related
Course status	compulsory
Language of instruction	English
Semester of delivery	semester 6
Pre-requisites	Engineering Drawing, Fundamentals of Machining, Fundamentals of CNC Programming, Metrology for Manufacturing
Examination required (YES/NO)	YES
ECTS value	5

Mode of instruction	lecture	class	laboratory	project	seminar
No. of hours per semester	15		15	30	

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	They will have a fundamental knowledge of creating and analyzing technical documentation with elements of engineering design with the use of graphic and computational programs.	MiBM1_W12
	W02	They will have knowledge of appropriate production planning, taking into account logistics issues, knows the basic principles of designing technological processes of machine parts.	MiBM1_W17
Skills	U01	They will be able to use CAD/CAM software to design and manufacture products	MiBM1_U02
	U02	They are able to develop documentation on 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
	U03	They will be able to design a simple technological process of mechanics and select appropriate machines and devices for this purpose.	MiBM1_U08
Competence	K01	On completion of this programme students will understand the need for and know the opportunities of gaining further professional qualifications (second cycle programmes, third cycle programmes, postgraduate non-degree courses, training courses) to enhance their professional, personal and social development.	MiBM1_K01
	K02	They will be aware of and understand the relationships between engineering and non-engineering activities, including their impact on the environment and the responsibility for decision-making.	MiBM1_K02

COURSE CONTENT

Type of instruction*	Topics covered
lecture	As part of the lectures, the following content will be provided, including: classification of cutting tools, characteristics of cutting tools, construction of cutting tools, geometry of cutting tools, materials used for cutting tools, design solutions used in the construction of cutting tools, construction of turning knives, boring bars, chisel knives, drills, countersinks, reamers, broaches, cutters, saws, threading tools.
laboratory	As part of the laboratory classes, 6 exercises will be carried out to implement the production technology of a monolithic cutting tool: <ul style="list-style-type: none"> • measurement of the geometry of the selected cutting tool and the hardness of the cutting edge, • equipping the machine tool with tools and machining holders (tool picking, tool measurement, loading tools into the machine tool), • blank preparation (cutting material, writing machining programs, roughing), • machining of a monolithic cutting tool on selected machine tools, • sharpening a monolithic cutting tool on a tool grinder, • quality control of the manufactured monolithic cutting tool.

project	<p>Development of the production process and design of a monolithic cutting tool based on the measurements of the reference tool. The scope of the project includes:</p> <ul style="list-style-type: none"> development of a 3D model and technical drawing of a monolithic cutting tool in a CAD program, selecting the material from which the monolithic cutting tool will be made, selecting the machine tool, holder, tools and technological parameters that will be used in the production process of the designed monolithic cutting tool, development of the technological process of a monolithic cutting tool.
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*) Please delete rows in the table above that are not applicable.

ASSESSMENT METHODS

Outcome code	Methods of assessment <i>(Mark with an X where applicable)</i>					
	Oral examination	Written examination	Test	Project	Report	Other
W01		X				
W02		X				
U01			X	X	X	
U02			X	X	X	
U03			X	X	X	
K01						X
K02						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction*	Assessment type	Assessment criteria
lecture	examination assessment	The pass mark is a minimum of 50 points out of a possible 100 for the final in-class test.
laboratory	non-examination assessment	Regular class attendance. The pass mark is a minimum of 50 points out of a possible 100 for each post-lab report and the final in-class test.
project	non-examination assessment	Regular class attendance. The pass mark is a minimum of 50 points out of a possible 100 for the project and the final in-class test.

*) 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	15		15	30		h
2.	Other contact hours (office hours, examination)	4		2	2		h
3.	Total number of contact hours	68					h
4.	Number of ECTS credits for contact hours	2,7					ECTS
5.	Number of independent study hours	57					h
6.	Number of ECTS credits for independent study hours	2,3					ECTS

7.	Number of practical hours	94	h
8.	Number of ECTS credits for practical hours	3,8	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. Cutting Tool Technology: Industrial Handbook by Graham T. Smith
2. Cutting Tools by Ronald Edwards
3. Gear Cutting Tools: Science and Engineering by Stephen P. Radzevich
4. Geometry of Single-point Turning Tools and Drills: by Viktor P. Astakhov