Kielce University of Technology

FACULTY OF MECHATRONICS AND MECHANICAL ENGINEERING

Annex 9
to the Rector's Ordinance No. 35/19
of 12 June 2019

COURSE SPECIFICATION

Course code	**M#1-S1-MiBM-KWW-608**
Course title in Polish	**Technologie zaawansowane**
Course title in English	**Advanced Technology**
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	**Prof. dr hab. inż. Czesław Kundera**
Approved by	

COURSE OVERVIEW

Course type	**programme-specific**
Course status	**compulsory**
Language of instruction	English
Semester of delivery	**semester 6**
Pre-requisites	**Machine Building Technology, Basics of Exquisite Machining, Computer Record of Structures, Metal Science**
Examination required (YES/NO)	YES
ECTS value	**2**

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

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Has a detailed and in-depth knowledge of the techniques of manufacturing machine parts, including subtractive and non-waste techniques, methods of bonding materi-als, taking into account additive and laser technologies, rapid prototyping and reverse engineering, also has a structured and in-depth knowledge of the subject of building various types of serving 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.	MiBM 1_W15
Skills	U01	He is able to develop documentation concerning the im-plementation of an engineering task in the field of me-chanics and machine construction, prepare a text con-taining an overview of the results of this task.	MiBM 1_U04
	U02	He can design a simple technological process in the field of mechanics and machine construction and select ap-propriate machines and devices for this purpose.	MiBM 1_U08
Competence	K01	Is aware of the responsibility for their own work, under-stands the need to submit to the rules of working in a team and be responsible for jointly performed tasks.	MiBM 1_K04

COURSE CONTENT

Type of instruction*	Topics covered
lecture	1. Introduction to computer-aided manufacturing systems. Techniques of geometric modeling. 2. Designing machining processes in CAM. 3. Principles of designing technological processes for machining parts of the class lever, body. Framework processes. 4. Tooth technologies. Principles of designing technological processes of gear class parts. 5. Unconventional methods of production. Processing with a concentrated stream of energy. 6. High speed dry and hard machining at high speed. Machining of long holes and machining of micro-holes. 7. Development tendencies in the technology of machine parts. Introduction to addi-tive technologies. 8. Completion of the course (exam).

project	1. Conducting the analysis of input data to the technology design of a given body or lever class part. Establishing the process structure. Selection of machine tools, tools and machining equipment. 2. Calculation of machining allowances, determination of the shape and dimensions of the semi-finished product, selection of the semi-finished product. 3. Development of the framework technological process of the given part, discuss the basic problems related to the fixing and mounting of the element in the machine tool working space for the CAM program. 4. Development of a 3D model of a given element in a CAD program, e.g. Solid-Works,. 5. Selection of cutting parameters for the CAM program, e.g. EdgeCam. 6. Development of a control program for a numerically controlled machine tool in the CAM program. 7. Preparation of documentation of the manufacturing plan, taking into account the technological equipment. 8. Completion of the course.

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

ASSESSMENT METHODS

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

Outcome code	Methods of assessment Project *(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 assess-ment**	Class attendance, minimum 2/3 attendance. Passing written exam
project	**examination assess-ment**	Class attendance, minimum 2/3 attendance. Passing the project.

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

OVERALL STUDENT WORKLOAD

ECTS weighting							
	Activity type	Student workload					Unit
1.		L	C	Lab	P	S	h

	Scheduled contact hours	15			15		
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**	**14**					h
6.	**Number of ECTS credits for independent study hours**	**0.6**					ECTS
7.	**Number of practical hours**	**25**					h
8.	**Number of ECTS credits for practical hours**	**1**					ECTS
9.	**Total study time**	**50**					h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**2**					ECTS

READING LIST

1) Feld M.: Podstawy projektowania procesów technologicznych typowych części maszyn. WNT Warszawa 2000.
2) Ruszaj A.: Niekonwencjonalne metody wytwarzania elementów maszyn i narzędzi. Instytut Obróbki Skrawaniem, Kraków, 1999.
3) Przybylski W., Deja M.: Komputerowe wspomaganie wytwarzania maszyn. Podstawy i zastosowanie. WNT, Warszawa, 2007.
4) Przybylski L.: Strategia doboru warunków obróbki współczesnymi narzędziami. Toczenie – wiercenie – frezowanie. Politechnika Krakowska, Kraków, 2000.
5) Chlebus E.: Innowacyjne technologie rapid prototyping – rapid tooling w rozwoju produktu. Oficyna Wydawnicza Politechniki Wrocławskiej, 2003.
6) Chlebus E.: Techniki komputerowe CAx w inżynierii produkcji. WNT, Warszawa 2000.
7) Augustyn K.: EdgeCAM. Komputerowe wspomaganie wytwarzania. Helion, Gliwice 2006.
8) Augustyn K.: „EdgeCAM. Komputerowe wspomaganie obróbki skrawaniem", Wydawnictwo HELION, 2002.
9) Babiuch M.: „SolidWorks 2009 PL. Ćwiczenia", Wydawnictwo HELION, 2009.
10) Dokumentacja EdgeCam ze strony www.nicom.p