



MODULE DESCRIPTION

Module code	full-time studies:	Z-ZIP1-E-602
	part-time studies:	Z-ZIPN1-E-602
Module name	Computer Aided Engineering	
Module name in Polish	Komputerowe wspomaganie prac inżynierskich	
Valid from academic year	2019/2020	

MODULE PLACEMENT IN THE SYLLABUS

Field of study	MANAGEMENT AND PRODUCTION ENGINEERING
Level of education	1st degree
Studies profile	General
Form and method of conducting classes	Full-time and Part-time
Specialisation	All
Unit conducting the module	Department of Production Engineering
Module co-ordinator	Wacław Gierulski, PhD, DSc
Approved by:	Dariusz Bojczuk, PhD, DSc

MODULE OVERVIEW

Type of subject / group of subjects	Major
Module status	Compulsory
Language of conducting classes	English
Module placement in the syllabus - semester	Semester VI
Initial requirements	Engineering Graphics Grafika inżynierska – SolidWorks Engineering Design
Examination (YES/NO)	NO
Number of ECTS credit points	2

Method of conducting classes		Lecture	Classes	Laboratory	Project	Other
Per semester	full-time studies:	15		15		
	part-time studies:	9		9		

TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Knowledge	W01	The student has knowledge of the general principles of engineering design, creation and analysis of technical documentation using graphic programs and the possibility of visualization in 3D printing technology.	ZIP_W06
	W02	He has knowledge of the product life cycle in connection with the environmental burden and knows the engineering possibilities ensuring sustainable development while preserving resources for future generations.	ZIP_W15
	W03	The student has knowledge of introducing new products with elements of innovation, taking into account the principles of the market economy	ZIP_W16
Skills	U01	The student is able to act taking into account intellectual property rights, examine property rights on the basis of the databases of the PPO. He appreciates the value of new innovative solutions and the need for continuous development.	ZIP_U11
	U02	He can see the relationship between the activities and engineering decisions and the non-technical area, including environmental, business and economic aspects.	ZIP_U15
Social competences	K01	The student is aware of the environmental impact of the designed devices and responsibility for their functioning.	ZIP_K02
	K02	Is aware of the responsibility in the implementation of teamwork, compliance with common rules and the need to bear joint responsibility for the implementation process and final effects.	ZIP_K04

TEACHING CONTENTS

Method of conducting classes	Teaching contents
Lecture	<p>Engineering works - design, construction, development of production technology, organization of the production system. Examples.</p> <p>The design process - design assumptions: functions performed, group of recipients, materials used, material consumption, costs.</p> <p>Ergonomics at the design stage.</p> <p>Full life cycle analysis at the design stage - environmental impact.</p> <p>Computer aided design process using SolidWorks software.</p> <p>Prototyping with the use of 3D printing in the design process. Processing of documentation into control files in 3D printers.</p> <p>The concept of a new solution, modification and improvement of products (product development), the issue of innovation.</p> <p>Examples of product development (secondary data) - case study.</p> <p>The process of development of a utility product (not a part of the machine) - subsequent stages. Example.</p>
Laboratory	<p>Implementation of the development process of an exemplary product selected by students. Design assumptions, simplified graphic documentation, necessary calculations, selection of materials, analysis of ergonomic features. Variants of solutions.</p> <p>They should be consumer products and the design is mainly about the shape and materials used. Design considerations can be ignored.</p> <p>Projects carried out in teams with the size specified by the teacher. Designs made with the use of SolidWorks software.</p>

METHODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes (select X)					
	Oral exam	Written exam	Test	Project	Statement	Other
W01			X			
W02			X			
W03						
U01				X		
U02				X		
K01				X		X
K02				X		X

FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Lecture	Credit with grade	Obtaining at least 50% of the points in the colloquium in the form of a test carried out in the last lecture classes.
Laboratory	Credit with grade	Obtaining a total of at least 50% of the points from the projects carried out in laboratory classes, analyzed during discussions with the teacher.

STUDENT WORKLOAD

Balance of ECTS points												
No.	Type of student's activity	Student's workload										Unit
		full-time					part-time					
1.	Participation in the activities	Lc	C	Lb	P	O	Lc	C	Lb	P	O	h
		15		15			9		9			
2.	Other (consultation, exam)	2		2			2		2			h
3.	Number of hours of a student's as- sisted work	34					22					h
4.	Number of ECTS credit points which are allocated for assisted work	1,4					0,9					ECTS
5.	Number of hours of a student's un- assisted work	16					28					h
6.	Number of ECTS credit points which a student receives for unassisted work	0,6					1,1					ECTS
7.	Work input connected with practical classes	25					25					h
8.	Number of ECTS credit points which a student receives for practical classes	1,0					1,0					ECTS
9.	Total number of hours of a stu- dent's work	50					50					h
10.	Punkty ECTS za modul <i>1 ECTS=25 hours</i>	2										ECTS

LITERATURE

1. Golenko A. (2010), *Fundamentals of Machine Design. A Coursebook for Polish and Foreign Students*, Politechnika Wrocławska, Wrocław (https://www.dbc.wroc.pl/Content/7154/Golenko_Fundamentals%20of%20Machine%20Design.pdf)
2. Lombard M. (2010), *SolidWorks 2010 bible*, Indianapolis, IN: Wiley Pub.
3. Simmons C.H., Phelps N., Maguire D.E (2012), *Manual of Engineering Drawing*, Elsevier Ltd.
4. Zeid I. (2015), *Mastering SolidWorks. The Design Approach*, Pearson Education, New Jersey (http://repo.darmajaya.ac.id/4194/1/Mastering%20SolidWorks_%20The%20Design%20Approach%20%28%20PDFDrive%20%29.pdf)
5. <https://www.solidworks.com/>