

## SYLLABUS OF A MODULE

Polish name of a module	<b>Komputerowe wspomaganie projektowania</b>
English name of a module	<b>CAD</b>
ISCED classification - Code	0715
ISCED classification - Field of study	<i>Mechanics and metal trades</i>
Languages of instruction	<i>English</i>
Level of qualification:	<i>1 – BSc (EQF 6)</i>
Number of ECTS credit points	<i>6</i>
Examination:	<i>A - assignment</i>
Available in semester:	<i>A – autumn only</i>

### Number of hours per semester:

Lecture	Tutorials	Laboratory	Seminar	E-learning	Project
15	0	45	0	0	0

## **MODULE DESCRIPTION**

### **MODULE OBJECTIVES**

01. Students obtain knowledge of the construction of any machine parts and mechanisms using CAD applications on the example of the SolidWorks program.
02. Acquisition of practical skills by students and preparation for independent geometrical and structural modeling of machine elements and their assemblies in CAD programs on the example of the SolidWorks system.

### **PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Basic knowledge of engineering graphics and technical drawing.
2. Ability to use various sources of information.
3. Ability to work independently and in a group.
4. Ability to interpretation and presentation of obtained results.

### **LEARNING OUTCOMES**

- LO 1 – Student identifies the possibilities of modeling elements, machine sets and mechanisms in 3D space in CAD programs on the example of the SolidWorks program.
- LO 2 – Student is able to create geometrical and structural models along with their parameterization in relation to CAD applications on the example of the SolidWorks program.
- LO 3 – Student is able to make a 3D model of a machine element, mechanism and assembly with a complex structure in a CAD program on the example of the SolidWorks system.

## MODULE CONTENT

Type of classes – lecture	Number of hours
Lec 1 - Characteristics of basic issues related to geometrical and structural modeling.	1
Lec 2 - Introduction to SolidWorks. Basics of operation and program infrastructure.	1
Lec 3,4 - Creating, editing and operations on 2D profiles.	2
Lec 5 - Defining geometrical and dimensional constraints in sketches.	1
Lec 6÷9 - Solid modeling. Tools, methods and functions used to create solid models.	4
Lec 10 - Diagnosis of problems, analysis and repair of parts.	1
Lec 11 - Global variables and equations.	1
Lec 12,13- 2D design documentation.	2
Lec 14,15 - Modeling and using assemblies.	2
<b>Sum</b>	<b>15</b>
Type of classes– laboratory.	Number of hours
Lab 1 - Getting to know the basic functions of the SolidWorks program, its interface, model history, and navigating the model space.	3
Lab 2 - Creating, editing and operations on 2D profiles.	3
Lab 3 - Completing the task illustrating the creation of profiles using drawing tools and editing tools.	3
Lab 4 - Application of geometric and dimensional constraints and parameterization of profiles.	3
Lab 5 - Completing the task illustrating the creation of parameterized profiles with defined geometric and dimensional constraints.	3
Lab 6 - Connecting profiles with 3D geometry.	3
Lab 7 - The use of reference elements and the use of basic solid modeling commands.	3
Lab 8 - Editing, modification and transformation of solids.	3
Lab 9 - Construction of a parameterized solid model.	3
Lab 10,11 - Creating 2D documentation for the solid model.	6
Lab 12÷14 - Positioning and transforming components. Creating a set of elements. Assembly analysis.	9
Lab 15 - Diagnosis of problems, analysis and repair of parts and assemblies.	3
<b>Sum</b>	<b>45</b>

## TEACHING TOOLS

1. - Power Point presentations, lecture notes, sample problems.
2. - Laboratory tutorials.
3. - Computer workstations equipped with the SolidWorks program -educational license.
4. - Models of machine elements and machine assemblies.

## WAYS OF ASSESSMENT ( F – FORMATIVE, S – SUMMATIVE

<b>F1.</b> - assessment of preparation for laboratory exercises
<b>F2.</b> - assessment of the ability to apply the acquired knowledge while doing the exercises
<b>F3.</b> - evaluation of reports on the implementation of exercises covered by the curriculum
<b>F4.</b> - assessment of activity during classes
<b>S1.</b> - assessment of the ability to solve the problems posed and the manner of presentation obtained results - pass mark *
<b>S2.</b> - assessment of mastery of the teaching material being the subject of the lecture - test

\*) in order to receive a credit for the module, the student is obliged to attain a passing grade in all laboratory classes as well as in achievement tests.

## STUDENT'S WORKLOAD

No.	Forms of activity	Average number of hours required for realization of activity
<b>1. Contact hours with teacher</b>		
1.1	Lectures	15
1.2	Tutorials	0
1.3	Laboratory	45
1.4	Seminar	0
1.5	Project	0
1.6	Examination	0
Total number of contact hours with teacher:		60
<b>2. Student's individual work</b>		
2.1	Preparation for tutorials and tests	0
2.2	Preparation for laboratory exercises, writing reports on laboratories	60
2.3	Preparation of project	0
2.4	Preparation for final lecture assessment	20
2.5	Preparation for examination	0
2.6	Individual study of literature	10
Total number of hours of student's individual work:		90
Overall student's workload:		150
<b>Overall number of ECTS credits for the module</b>		<b>6 ECTS</b>
Number of ECTS points that student receives in classes requiring teacher's supervision:		2.4 ECTS
Number of ECTS credits acquired during practical classes including laboratory exercises and projects:		4.2 ECTS

## **BASIC AND SUPPLEMENTARY RESOURCE MATERIALS**

1. Dassault Systems SolidWorks Corporation: SOLIDWORKS 2015. Advanced Part Modelling, USA, 2015.
2. Dassault Systems SolidWorks Corporation: SOLIDWORKS Education Edition 2016-2017. Fundamentals of 3D Design and Simulation, USA, 2017.
3. Dassault Systems SolidWorks Corporation: SOLIDWORKS Web Help 2020.
4. Lombard M.: SolidWorks 2011 Parts Bible, John Wiley & Sons, 2011.
5. Lombard M.: SolidWorks Assemblies Bible, John Wiley & Sons, 2011.
6. Tran P.: Certified SolidWorks Professional Advanced Preparation Material, SDC Publications; 2017.
7. Willis J., Dogra S.: SolidWorks 2019: A Power Guide for Beginners and Intermediate User Paperback, CADArtifex, 2019.
8. Zeid I.: Mastering SolidWorks, Pearson Peachpit, 2014.

## **MODULE COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)**

Dr hab. inż. Dawid Cekus prof. PCz -cekus@imipkm.pcz.pl