

COURSE SYLLABUS

Polish name of a module	Komputerowe wspomaganie projektowania (CAD)
English name of a module	Computer Aided Design (CAD)
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>3 ECTS</i>
Examination:	<i>A - assignment</i>
Available in semester:	<i>S – spring only</i>

Total number of hours per semester:

Lecture	Tutorial	Laboratory	Seminar	Project	Other
0	0	30	0	0	0

COURSE DESCRIPTION

COURSE OBJECTIVE

- O1. Students gain knowledge of the possibilities of computer-aided design using modern software tools.
- O2. Students gain practical skills in modeling machine elements and their assemblies in Inventor
- O3. Students gain skills in simulating the interaction of Inventor assembly elements

PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of design notation

2. Knowledge of design principles in the field of machine design basics, knowledge of the system of machine element standards.
3. Computer skills.
4. Ability to use various sources of information, including online knowledge bases.
5. Ability to work independently and in a group.
6. Ability to correctly interpret and present one's own activities

LEARNING OUTCOMES

LO 1 – knows the possibilities of modeling machine elements and assemblies in 3D space in CAD programs using the example of Inventor EU 2 – is able to independently create a 3D model of a machine element and assembly with a complex structure in Inventor,

LO 2 – is able to independently create a 3D model of a machine element and assembly with a complex structure in Inventor

COURSE CONTENT

Course type – LABORATORY	Number of hours
Lab1 – Inventor interface and environment.	2
Lab2 – Sketches: basic creation.	2
Lab3 – Sketches: construction lines, constraints, parameterization, editing operations.	2
Lab4 – Part shaping – extrusion, rotation	2
Lab5 – Part shaping – basic part editing commands.	2
Lab6 – Part shaping – compound extrusion,	2
Lab7 – Part shaping – sweeping, holes, coils	2
Lab8 – Part shaping – advanced editing methods.	2
Lab9 – Part shaping – pattern, fillets, 3D sketches.	2
Lab10 – Simple assemblies	2

Lab11 – Complex assemblies – constraints in assemblies.	2
Lab12 – Using standard part libraries.	2
Lab13 – Bolted connections.	2
Lab14 – Editing assemblies, copying elements, pattern, mirror.	2
Lab15 – Editing assemblies, pattern, mirror.	2
SUM	30

TEACHING TOOLS

1. – introduction to the program – computer presentation
2. – Inventor program – educational license available in the laboratory
3. – exercise demonstration – computer presentation
4. – manual available on the IMiPKM website
5. – models of machine elements and assemblies
6. – computer stations

METHODS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

F1. – Laboratory exercise execution
F2. – Oral response
F3. – Laboratory exercise report
F4. – Participation in discussion (activity in classes)
P1. – Colloquium / test*

*) a prerequisite for receiving credit is to receive positive grades on all of the above listed items.

STUDENT WORKLOAD

Ref	Form of activity	Average number of hours to complete the
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No.		activity
1. Contact hours		
1.1	Lectures	0
1.2	Tutorials	0
1.3	Laboratories	30
1.4	Seminars	0
1.5	Project	0
1.6	Office hours	0
1.7	Exam	0
Total contact hours:		30
2. Self-study hours		
2.1	Preparation for tutorials and the final test	0
2.2	Laboratory preparation, laboratory report preparation	35
2.3	Project preparation	0
2.4	Preparation for the final lecture test	0
2.5	Exam preparation	0
2.6	Literature review	10
Total self-study hours:		45
Total student workload:		75
TOTAL NUMBER OF ECTS POINTS FOR THE COURSE		3
Number of ECTS points which a student obtains in classes requiring direct teacher participation:		1.2
Number of ECTS points that a student obtains in practical classes, including laboratory and project classes:		2.6

PRIMARY AND SUPPLEMENTARY RESOURCES

1. Stasiak F.: Zbiór ćwiczeń Autodesk Inventor 11. Wydawnictwo ExpertBooks, Łódź 2007.
2. Cekus D., Kania L.: Modelowanie elementów i zespołów maszyn w programach grafiki inżynierskiej. Częstochowa 2009.
3. Kania L.: Podstawy programu AutoCAD – modelowanie 3D. Wydawnictwo Politechniki Częstochowskiej, Częstochowa 2007.
4. Noga B., Kosma Z., Parczewski J.: Inventor. Pierwsze Kroki. Helion., Gliwice 2009
5. Tomski L., Podgórska – Brzdękiewicz I., Szmidla J., Uzny S.: Drgania i stateczność układów dyskretnych. Wydawnictwo Politechniki Częstochowskiej, Częstochowa 2006

COURSE COORDINATOR (NAME, SURNAME, DEPARTMENT, E-MAIL)

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MATRIX OF LEARNING OUTCOMES

Learning outcome	Reference of the given outcome to outcomes defined for the entire program (CLO)	Course objectives	Course content	Teaching tools	Method of assessment
LO 1	K_W09, K_U05, K_U08, K_K01	O1-O3	Lab1-Lab15	1-6	F1-F4, P1

LO 2	K_W09, K_U05, K_U08, K_K01	O1-O3	Lab1-Lab15	1-6	F1-F4, P1
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FORMS OF ASSESSMENT– DETAILS*

Learning outcomes	Grade 2.0	Grade 3.0	Grade 4.0	Grade 5.0
LO 1	The student has not mastered the basic knowledge of 3D modeling and computer-aided engineering work	The student has partially mastered knowledge of 3D modeling and computer-aided engineering work	The student has mastered knowledge of 3D modeling and computer-aided engineering work, is able to indicate the appropriate program tools	The student has very well mastered knowledge of the material covered by the curriculum, independently acquires and expands knowledge using various sources
LO 2	The student is unable to draw a model of a given solid, even with the help of the instructor	The student is unable to independently select the appropriate modeling tools, needs the instructor's help	The student correctly uses knowledge and independently solves problems arising during the implementation of exercises	The student is able to make a model in many ways available in the program, looks for non-standard solutions, gaining

				knowledge from various sources
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* A half grade of 3.5 is given if the student has achieved the learning outcomes for a grade of 3.0 but has not fully completed the learning outcomes for a grade of 4.0 .A half grade of 4.5 is given if the student has achieved the learning outcomes for a grade of 4.0, but the student has not fully completed the learning outcomes for a grade of 5.0.

OTHER USEFUL COURSE INFORMATION

1. Course topics, resources and literature are provided in classes, in the teacher's office, and in the USOS system.
2. Information on office hours is provided to students during the first class of a given course, and is also placed on website - www.wim.pcz.pl