

## COURSE SYLLABUS

Course name in Polish	Rysunek techniczny
Course name in English	Technical drawing
Course type	Directional
ISCED code	0715
Field of study	Computer Modelling in Mechanics
Language of instruction	English
Level of qualification	First cycle
Form of study	Full-time studies
ECTS points	5
Semester	1

### Total number of hours per semester:

Lecture	Tutorial	Laboratory	Seminar	Project	Other
15	0	30	0	15	0

## **COURSE DESCRIPTION**

### **COURSE OBJECTIVE**

- O1. Mastering the method of reading and recording (dimensioning) the geometric shape and structure of spatial elements, parts and assemblies of mechanical devices.
- O2. Learning the principles of drawing machine parts and assemblies in accordance with the standards for technical drawing and the use of drawing simplifications.
- O3. Acquiring practical skills in drawing machine elements and their assemblies in AutoCAD program.

## **PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Knowledge of graphical notation of construction.
2. Ability to use drawing and measuring instruments.
3. Computer skills.
4. Ability to use various sources of information, including: norms and 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 – The student knows the principles of engineering graphics that enable solving technical problems in the field of mechanics and machine construction.

LO 2 – The student is able to prepare technical documentation in accordance with the principles of machine drawing and standardization principles.

LO 3 – The student has the ability to use the AutoCAD program.

## **COURSE CONTENT**

<b>Course type – LECTURE</b>	<b>Number of hours</b>
<b>L 1-3</b> – Theoretical foundations of the first angle orthogonal projection method. Elements of space. Practical use of the orthogonal projection method.	<b>3</b>
<b>L 4</b> – Axonometric representation (isometry, dimetry) used in the graphical notation of construction. Perspective.	<b>1</b>
<b>L 5-6</b> – Basics of technical drawing, standardization, sheets and their frames, writing, plates, types and applications of lines, scales.	<b>2</b>

<b>L 7</b> – Theoretical foundations of creating views and sections of flat-walled solids and solids of revolution.	<b>1</b>
<b>L 8-10</b> – Determination of outlines, sections and layouts of parts and their designation. Principles of dimensioning of machine elements. Tolerance of dimensions, roughness, fits, deviations of shape and position.	<b>3</b>
<b>L 11-13</b> – Principles of simplification and drawing of shape joints, welded, soldered and glued joints, gears, bearings and other elements.	<b>3</b>
<b>L 14-15</b> – Constructions in descriptive geometry.	<b>2</b>
<b>Σ</b>	<b>15</b>
<b>Course type – LABORATORY</b>	<b>Number of hours</b>
<b>Lab 1-2</b> – AutoCAD interface and environment: basic drawing elements.	<b>4</b>
<b>Lab 3</b> – AutoCAD: editing commands, drawing optimization methods, prototype drawings.	<b>2</b>
<b>Lab 4-5</b> – AutoCAD: manufacturing drawings of parts.	<b>4</b>
<b>Lab 6</b> – Making projections of the element using the first angle orthographic projection method (European method).	<b>2</b>
<b>Lab 7</b> – Drawing of a flat wall element with holes. Application of a stepped cross-section, dimensioning.	<b>2</b>
<b>Lab 8-11</b> – Creating drawings of machine parts using AutoCAD.	<b>8</b>
<b>Lab 12-13</b> – AutoCAD: basic and advanced modeling tools.	<b>4</b>
<b>Lab 14-15</b> – Preparation of assembly drawings of parts, preparation of drawings of non-standard parts.	<b>4</b>
<b>Σ</b>	<b>30</b>

<b>Course type – PROJECT</b>	<b>Number of hours</b>
<b>P 1-2</b> – Introduction to making sketches of machine and device components.	<b>2</b>
<b>P 3-4</b> – The use of basic drawing tools.	<b>2</b>
<b>P 5-6</b> – Preparation of drawings of solids.	<b>2</b>
<b>P 7-9</b> – Constructions in descriptive geometry.	<b>3</b>
<b>P 10-15</b> – Preparation of drawings of machine parts.	<b>6</b>
<b>Σ</b>	<b>15</b>

### **TEACHING TOOLS**

<b>1.</b> Models of solids, elements and assemblies of machines, technical documentation.
<b>2.</b> Drawing tables, drawing instruments and measuring devices.
<b>3.</b> Blackboard and computer presentation.
<b>4.</b> Introduction to using the program – computer presentation.
<b>5.</b> AutoCAD program – educational license available in the laboratory.
<b>6.</b> Lecturer's original materials.
<b>7.</b> Computer workstations.
<b>8.</b> E-learning platform of the Częstochowa University of Technology

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

<b>F01</b> Test
<b>F02</b> Oral response.

<b>F03</b> Evaluation of drawings from the implementation of exercises included in the curriculum.
<b>F04</b> Participation in discussion (activity in classes)
<b>P01</b> Project execution
<b>P02</b> Test

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

### STUDENT WORKLOAD

Ref No.	Form of activity	Average number of hours to complete the activity
<b>1. Contact hours</b>		
1.1	Lectures	15
1.2	Tutorials	0
1.3	Laboratories	30
1.4	Seminars	0
1.5	Project	15
1.6	Office hours	0
1.7	Exam	0
Total contact hours:		60
<b>2. Self-study hours</b>		
2.1	Preparation for tutorials and the final test	0
2.2	Laboratory preparation, laboratory report preparation	20
2.3	Project preparation	30

2.4	Preparation for the final lecture test	10
2.5	Exam preparation	
2.6	Literature review	5
Total self-study hours:		65
Total student workload:		125
<b>TOTAL NUMBER OF ECTS POINTS FOR THE COURSE</b>		3
Number of <b>ECTS</b> points which a student obtains in classes requiring direct teacher participation:		2.4
Number of <b>ECTS</b> points that a student obtains in practical classes, including laboratory and project classes:		3.8

#### **PRIMARY AND SUPPLEMENTARY RESOURCES**

1. ISO norms
2. Isanga E., Technical Drawing, Plane & Solid Geometry" at both ordinary and advanced levels. 2023
3. Moss E., Autodesk AutoCAD 2022 Fundamentals, SDC Publications, 2021
4. Ramirez A., Congdon-Fuller A., Smith D., Technical Drawing 101 with AutoCAD 2024, SDC Publications, 2023
5. Frederick E. Giesecke, Alva E. Mitchell, Henry C. Spencer at all. Technical Drawing. Pearson Education, 2009
6. Lockhart S., Johnson C., Goodman M. and Giesecke F., Technical Drawing with Engineering Graphics., Pearson Education (US), 2023

#### **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_W05	O1	L1-15	1-8	P2
LO 2	K_W05, K_U05	O2, O3	Lab1-30, P1-15	1-8	F01-04, P01
LO 3	K_W05, K_U05	O3	Lab1-30, P1-15	1-8	F01-04, P01

### FORMS OF ASSESSMENT- DETAILS\*

Learning outcomes	Grade 2.0	Grade 3.0	Grade 4.0	Grade 5.0
LO 1	The student knows the principles of engineering graphics that enable solving technical problems.	The student knows selected principles of engineering graphics that enable solving technical problems.	The student has mastered the principles of engineering graphics enabling the solving of technical problems.	The student has very good mastery of the principles of engineering graphics enabling the solving of

				technical problems.
<b>LO 2</b>	The student has not mastered basic knowledge of technical drawing. The student is unable to draw projections of indicated parts and draw a technical drawing even with the help of the instructor.	<p>The student has mastered knowledge of technical drawing to a small degree.</p> <p>The student draws projection drawings of indicated parts with errors and draws technical drawings without following all the rules of technical drawing and standardization.</p> <p>The student needs help from the instructor.</p>	<p>The student has mastered the knowledge of technical drawing and is able to apply it to more difficult graphic structures.</p> <p>The student correctly draws projections of indicated parts and draws technical drawings while maintaining some of the principles of technical drawing and standardization.</p> <p>The student correctly and independently solves problems arising during the implementation of exercises.</p>	The student has mastered the knowledge of the material covered by the curriculum very well, independently acquires and expands knowledge using various sources. The student correctly draws projection drawings of indicated solids and draws technical drawings in compliance with all the principles of technical drawing and standardization. The student is able to make models in many ways available in the program, and independently seeks non-

				standard solutions by acquiring knowledge from various sources.
<b>LO 3</b>	The student cannot use AutoCAD.	The student is able to make simple drawings in AutoCAD.	The student can make drawings in AutoCAD.	The student carefully and quickly creates drawings in AutoCAD.

\* 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](http://www.wim.pcz.pl)