

Course description

1 General information

Course name	Technical drawing and AutoCAD
Course code	
Level of study (B.Sc, M.Sc., Ph.D.)	B.Sc., M.Sc.
ECTS	6
Course manager	Dr hab. inż. Marek Barski, prof. PK, Institute of Machine Design M-03
Course length	One (1) semester
Coordinator for international programs	erasmus@mech.pk.edu.pl

2 Prerequisites

- None

2 Program

Type	Lectures	Classes	Labs	Computer labs	Project	Seminar
Hours	15	0	15	15	15	0

3 Contents

Lectures		
No.		Hours
1	Standard sizes of paper. Line styles and types and their applications. Technical lettering. Scale. Orthographic and axonometric projection. Views and cross-sections. Types of drawing. Standardization.	3
2	Principles of dimensioning. Tolerances and fits. Dimensional deviations. Geometric dimensioning and tolerancing. Surface roughness and waviness.	2
3	Drawing principles of machines elements. Drawing of connections and standard parts.	2
4	Fundamentals of cad drawing. Overview of CAD software (2D and 3D). AutoCAD fundamentals.	3
5	Techniques for creating and modifying elements on the drawing using AutoCAD	3
6	Precision drawing tools. Layers and blocks. Dimensioning, dimension styles and cross-sections in AutoCAD. Objects properties. Viewports. Scale drawing and plotting.	2

Labs		
No.	Introduction and principles of technical drawing	Hours
1	Technical alphabet engineering font. Types and thicknesses of drawing lines. First - angle and third - angle projections. Axonometric views. Principles of dimensioning.	5
2	Cross - sections. Drawing principles of machines elements. Drawing of connections and standard parts and threads. Drawing of machine elements with thread.	5
3	Drawing of mechanical shaft. Tolerations, fits and symbols of surface roughness on technical drawings	5

Computer labs		
No.		Hours
1	AutoCAD fundamentals. Creation of new drawing. Operations on files. Zoom. Model and paper space. Grid, snap, ortho. Absolute, relative and polar coordinate system.	3
2	Drawing commands (line, pline, circle, arc, rectangle, polygon, ellipse etc.). Snapping tools (OSNAP). Modifying commands (erase, copy and move, rotate, scale, offset, mirror and array). Layers. Text and dimensions. Dimension styles. Object properties.	4
3	Model and Paper space. Creation a viewports with different scales. Students draw a pressure vessel in AutoCAD.	4
4	Hatch a closed entity to represent sections. Chamfers and fillets. Tolerances, fits and surface roughness. Students draw a gear (AutoCAD).	4

Project		
No.		Hours
1	Solid projections	3
2	Standard parts of machines (screw, spring, weld, cross-section of a rolled profile)	3
3	Simplified cylindrical gear with straight external teeth	4
4	Sketches and assembly drawing of valve	5

3 Learning Outcomes (skills and knowledge):

- Student possess the elementary knowledge about the principles of the engineering drawing.
- Student possess the elementary knowledge about projections, cross-sections and marking dimensions in the drawing.
- Student is able to create the simple sketches of the parts of machines.
- Student is able to create and modify geometrical elements in the drawing using AutoCAD.
- Student can use the AutoCAD software in order to create simple engineering drawing.

4 Assessment policy (examination):

- Test
- Prepared and positively evaluated all projects

5 Literature

1. Green P. The geometrical tolerancing desk reference, Creating and interpreting ISO Standard Technical Drawing, Elsevier Amsterdam 2005.
2. Eide A. R., Jenison R. D., Mashaw L. H., Northup L. L., Sanders C. G., Engineering graphics problem book, McGraw-Hill Book Company, New York 1985.
3. Venkata Reddy K., Textbook of engineering drawing, BS Publications, 2008