

Technical Drawing II

Code: MK3MAB2A04JX20-EN

ECTS Credit Points: 4

Evaluation: exam

Semester: 2nd semester

Its prerequisite(s): Technical Drawing I

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Students get acquainted with basic rules of preparation of technical documentation. They acquire the specifications and get routine in preparation and application of technical drawings. They get acquainted with CAD systems, and get routine in the use of AutoCAD software.

Drawing standards, formal requirements of machine drawings. Drawing sheet dimensions, line types and thickness groups. Projection views, sections and sectional views, revolved- and removed sections. Drawings of standardized machine elements: threads and thread symbols, bolted joint, gears, sprocket-wheel, splined shaft, bearings. Representation of welded joints. General prescriptions for dimensioning. Conventional dimensioning methods. Tolerance system. Defining fits: clearance, transition and interference fit. ISO Tolerance system. Form and position tolerances. Defining the surface roughness.

General properties of AutoCAD. Utilization of commands, menu bar options and icons. The layer-system of the AutoCAD, operations with layers. Use of outer references and blocks. Dimensioning possibilities, building up dimensional chains, representation of tolerances.

Literature:

Compulsory:

- Tiba Zsolt, Machine drawing, Debreceni Egyetemi Kiadó – Debrecen University Press, 2013 □
Learning AutoCAD 2010, Autodesk Official Training Guide Edition, 2010

Recommended:

- Flender, Technical Handbook

Schedule

1 st week Registration week	
2 nd week: Lecture: Drawing standards, formal requirements of machine drawings. Drawing sheet dimensions, title block, defining the line types and thickness groups. Standardized letter and figure shape and sizes, scales, full size, reduction scales, enlarged scales. Practice: issuing the task 1: Lettering	3 rd week: Lecture: Defining the surfaces of a part. Views, auxiliary view, local view, sectional views and sections. Complex sectional views, removed sections, specific sectional views and sections. Practice: issuing the task 2: Drawing Machine Parts. Introduction of CAD systems, general properties of AutoCAD.

4th week:

Lecture: General prescriptions for dimensioning, choosing basis surfaces. Conventional dimensioning methods. Specific dimensioning, defining and giving conical taper and flat taper

Practice: submitting the task 1 and 2, issuing the task 3: Shaft drawing. User interface of AutoCAD. Utilization of commands, menu bar options and icons.

6th week:

Lecture: Hole-base system, shaft base system. Defining fits: clearance, transition and interference fit.

Practice: submitting the task 3, issuing the task 4: Designing Fitting Pieces. Applying the cutting plane and the cutting sphere method to construct the intersection lines of interpenetrating surfaces.

The layer-system of the AutoCAD, operations with layers.

8th week: 1st drawing week

9th week:

Mid-term test

Lecture: Defining the surface roughness. Feasible roughness with different processing methods. Correlation between the surface roughness and the IT grade of dimension.

Practice: elaborating the shop drawing of pattern development of fitting pieces.

Hatching, loading of styles, indication of areas to hatch in AutoCAD.

5th week:

Lecture: ISO Tolerance system. Basic size, actual size, limits, deviations, fundamental deviation. Defining the tolerance IT grades.

Practice: Applying the dimensioning methods to dimensioning parts.

“Modify” commands in AutoCAD. Effect of constructional commands on efficiency.

7th week:

Lecture: ISO Tolerance system. Form and position tolerances. Free dimensional tolerance.

Practice: Designing Fitting Pieces. Applying the triangulation and parallel line methods to

develop fitting pieces. Representing tolerances and calculating its dimensions.

Insertion of texts in AutoCAD. Loading and modification of letter types.

10th week:

Lecture: Standardized Thread forms and its main features. Threads and thread symbols in drawing. Threaded joints: bolted joint, studded joint, screw fastening.

Practice: submitting the task 4, issuing the task 5: Screw Fastening and Joints. Presentation of tolerances and fits in drawing. Presentation of surface roughness in drawing.

Use of outer references and blocks in AutoCAD.

11th week:

Lecture: springs: standardized representation of helical spring, Belleville spring, buffer spring, annular spring, multileaf spring. Keyed joints with saddle keys, sunk keys, parallel keys and woodruff keys. Splined shaft joint.

Practice: elaborating the task 5, Drawing threaded joints in section and on view.

Dimensioning possibilities in AutoCAD, building up dimensional chains, representation of tolerances.

13th week:

Lecture: rolling bearings: ball and roller bearings. Riveted joints. Welding symbols and welded joints: butt joint, lap joint, tee joint, corner joint.

Practice: submitting the task 5, elaborating task 6.

Drawing in AutoCAD.

15th week: 2nd drawing week

12th week:

Lecture: Gears and toothed parts. Spur and helical gears, bevel gears, worms, rack and pinion gears, sprockets.

Practice: issuing the task 6: Gearing. Drawing keyed joints and splined shaft joint in section and on view.

Drawing in AutoCAD.

14th week:

Lecture: End-term test

Practice: submitting the task 6. Drawing bearings, riveted and welded joints in section and on view.

Drawing in AutoCAD.

Requirements

A, for a signature:

Attendance on the lectures is recommended, but not compulsory.

Participation at practice is compulsory. Student must attend the practices and may not miss more than three practice during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Student can't make up a practice with another group. The attendance on practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments for the course with them to each practice. Active participation is evaluated by the teacher in every class. If student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate their participation as an absence due to the lack of active participation in class.

Students have to submit all the six drawing tasks made manually as well as with AutoCAD as scheduled minimum on a sufficient level.

B, for grade:

The course ends in exam. Based on the average of the marks of the drawings and the exam result, the final grade is calculated as an average of them.