

Technical Drawing I

Code: MK3MAB1A04JX20-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Semester: 1st semester

Its prerequisite(s): -

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 2+1

Topics:

Basis of axonometry and perspective. Projection drawing. Monge's method of projection. Point, line in a plane and intersection tasks (intersection of line with plane, intersection of two planes). Visibility of 3D objects. Method of the replacing image-planes (transformation of views). Rotation of plane. Representation of a polyhedrons, intersection of the polyhedrons with lines and planes. Intersection of two polyhedrons. Surfaces of revolution. Techniques of 3D representation in computer-aided modelling: representation of solids, sizing, geometric constructions, representation of polyhedrons, solid modelling, 3D constructions.

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Literature:

Compulsory:

- Church, A. E.: Elements of Descriptive Geometry, American Book Company, University of Michigan
- Fuller, A., - Ramirez, A. – Smith, D.: Technical Drawing 101 with AutoCAD 2020, SDC Publications
- Ledneczky, P.: Descriptive Geometry I., BUTE

Recommended:

- Pare, E. G.,- Loving, R. O. - Hill, I. L. - Pare, R. C.: Descriptive Geometry, Amazon
- Yamaguchi, F.: Computer-Aided Geometric Design, Springer Verlag

Schedule

1st week Registration week

2nd week:

Lecture, Practice: Axonometry, perspective.

Introduction to multiview projection.

4th week:

Lecture, Practice: Points and lines in the plane

Line in a plane, point in a plane.

First mainline and second mainline in a plane.

Point in a first/second projecting plane.

3rd week:

Lecture, Practice: Introduction to the Monge's method of projecting

Projection of the space-elements (points, lines, segments, planes).

Relative position of two straight lines.

Special positions of a straight line to image planes.

Special positions of the planes to the image planes.

5th week:

Lecture, Practice: Intersection of a line with the plane

Intersection of a line with the projecting plane.

Intersection of a line with the plane (in general position). Visibility.

6th week: Lecture, Practice: Intersection of two planes The intersection line of projecting planes. The intersection line of planes, if one of them is in projecting position. Intersection line of two planes.	7th week: Lecture, Practice: Method of the replacing image-planes (transformation of views) Introduction of new image planes, the method of the replacing of an image plane with a new plane. Rotation of the plane.
8th week: 1st drawing week	
9th week: Lecture, Practice: Metric tasks. Determining distances and angles of the objects Distance between two points. Length of the line-segment. Distance from a point to a plane. Distance from a point to a line. Angle of inclination of a line to the image-planes. Angle formed by two planes. Perpendicularity. Distance between two parallel lines. Distance between two skew lines. Distance between two parallel planes. Angle formed by two lines. Rotation of plane	10th week: Lecture, Practice: Intersection of the polyhedrons with lines and planes Intersection of prisms and pyramids with lines. Intersection of prisms and pyramids with planes.
11th week: Lecture, Practice: Intersection of two polyhedrons I. Intersection of prisms and pyramids.	12th week: Lecture, Practice: Intersection of two polyhedrons II. Curved surfaces Intersection of prisms and pyramids. Surfaces of revolution.
13th week: Lecture, Practice: Computer-aided geometric constructions I. Representation of solids and polyhedrons, sizing, 3D constructions.	14th week: Lecture, Practice: Computer-aided geometric constructions II. Representation of solids and polyhedrons, sizing, 3D constructions.
15th week: 2nd drawing week	

Requirements

A, for a signature:

Regular attendance (Minimum 70 %). Successful accomplishment of three drawings.

B, for grade:

Grades will be a composite of homework (drawing) (30%), mid-term test (35%), end-term test (35%). The homework will be issued five times in the semester. Minimum requirements to pass the semester: successful accomplishment of the drawings and tests (minimum 50%).