

Introduction to Drawing

Syllabus Number 2F101
Basic Major Subjects
Requisites 2 credit
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1. Course Description

In order to design a machine, it is necessary to select the material of parts constituting it, strength evaluation, and study of manufacturing / assembly method. Also, it is necessary to properly select machine elements such as screws so as to meet required specifications. The design information obtained in this way is transmitted to the manufacturing site using means called "drawings". This work is "drawing". In order to correctly communicate information, various rules for drawing are defined. In this course, students will understand these rules and actually create drawings using drafting tools. The aims in this lecture are to obtain knowledge on DP1 and to train goal achievement on DP3.

2. Course Objectives

Students will learn the machine drawing rules and understand the basics of machine drawing through assignment practice. Specifically, targets are the following items:

- (1) Understanding the projection method and converting a three-dimensional object to a two-dimensional plane
- (2) Understanding and using basic drawing rules such as dimensioning and tolerance
- (3) Understanding the workings of machine elements such as screws and gears and expressing them in drawings

3. Grading Policy

Evaluation is based on the submission of assignments to be presented in each lecture.

Evaluate grades according to each submitted subject.

Since the assignment will be returned after checking, please use it to confirm the degree of comprehension and target achievement.

4. Textbook and Reference

Textbook

Tadao Tsukada "Kikaisekkei·seizuno kiso 2nd Edition" Mathematical Engineering Company
ISBN 978-4901683685.

Reference

Kiyoshi Ohnishi "JIS ni motodoku hyoujun seizuho 15th Edition" Ohmsha
ISBN 978-4274224164

5. Requirements(Assignments)

The task is basically drawing creation. Be sure to bring A4 size grid paper and drawing tools such as, triangle ruler, compass etc. Also do not forget to bring your textbooks as described in section 4.

Preparation (about 1.5 hour); Please read the contents corresponding to each lesson of the text book and LMS material.

Review (about 1.5 hour); Please review the assignments given in the lecture so that you can do them in a short time without looking at the textbook.

6. Note

7. Schedule

- [1] Basics of machine drawing: Learn the basics of drawing, such as significance of machine drawing, purpose of drawing rules, usage of drawing tools
- [2] Projection method: Learn the basic drawing method and the projection method on the third angle projection method
- [3] How to represent figures (1): Learn expressions by partial projections and sectional views showing parts that are difficult to see
- [4] How to express figures (2): Learn about isometrics for understanding shapes in three dimensions
- [5] Dimensioning method (1): Learn the principles of dimensioning, dimension arrangement, and so on
- [6] Dimensioning method (2): Learn how to describe diameter / radial dimension, supplementary symbol, and basic processing method such as hole processing, etc.
- [7] Dimensional tolerance and fitting: Learn about tolerance concept, fitting type and notation
- [8] Exercise (1): Drafting of some mechanical parts including items which were studied so far
- [9] Geometrical tolerance (1): Learn geometrical tolerance such as linearity of axis and meaning of tolerance
- [10] Geometrical tolerance (2): Learn about position tolerance which are important in assembling parts and maximum material requirement considering rationality of machining
- [11] Surface texture: Learn how to request finished state of product
- [12] Mechanical elements (1): Learn about screw specifications and drawing methods
- [13] Mechanical elements (2): Learn about gear type and drawing method
- [14] Mechanical elements (3): Learn about bearing performance and drawing method
- [15] Exercise (2): Drawing machine parts including geometrical tolerance requirement