

# Experiments Engineering1

in

# Mechanical

Syllabus Number

1J301

Basic Major Subjects

Requisites 2 credit

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## 1. Course Description

This course is to understand mechanical engineering through experiments as follows:

Numerical experiment: Basic Analysis based on Finite Element Method

Experiment 1: Starting Friction of Rolling Bearing

Experiment 2: Test for Accuracy of Lathes

Experiment 3: Tensile Test for Metallic Materials

Experiment 4: Modeling and Experiment of Mechanical Phenomenon

Experiment 5: Heat Transfer in Double Pipe Heat Exchanger

Experiment 6: Measurement of Engine Vibration

Experiment 7: Pressure Loss in Piping System

Experiment 8: Experimental Modal Analysis and CAE Vibration Analysis

Students will learn knowledge, technique, and manner for DP2, DP3, DP4, and DP5.

## 2. Course Objectives

Students will perform experiments of material mechanics, fluid dynamics, thermal dynamics, mechanical dynamics, and machine element. Through experiments, students will deepen their understanding of theories learned in lectures. Moreover, students will learn safe manners, experiment methods, and use of experimental equipment and measuring instruments. In addition, students will learn the analysis of experimental data, graph making, and experimental consideration.

## 3. Grading Policy

Grading is determined with reports of each experiment. If the report is inadequate, it must be resubmitted. We will explain points that should be revised.

## 4. Textbook and Reference

Textbook

Japanese textbook: 機械・精密システム工学実験(産図テキスト)

## 5. Requirements(Assignments)

Students must review strength of material, fluid dynamics, thermal dynamics, mechanical dynamics, machine element, physics, and mathematics. In addition, students must study a textbook and handouts (1.5 hours).

## 6. Note

## 7. Schedule

Guidance

Basic lecture about experiment

Numerical experiment

First day of 1st experiment

Second day of 1st experiment

Third day of 1st experiment

First day of 2nd experiment

Second day of 2nd experiment

Third day of 2nd experiment

First day of 3rd experiment

Second day of 3rd experiment

Third day of 3rd experiment

First day of 4th experiment

Second day of 4th experiment

Third day of 4th experiment