

# Robot Sensing

Syllabus Number

3E332

Special Subjects

Elective 2 credit

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## 1. Course Description

The main topics are as follows:

- (1) Basics of measurement
- (2) Principles of sensors and their measuring techniques
- (3) Sensors for robot application

## 2. Course Objectives

This course aims to learn the broader knowledge of sensors and their measuring techniques.

## 3. Grading Policy

Students are evaluated with lecture files (30%), a mid-term exam (30%) and a term exam (40%).

## 4. Textbook and Reference

Textbook

No textbook is used.

## 5. Requirements(Assignments)

## 6. Note

## 7. Schedule

- [1] Introduction
- [2] Basics: technical terms in Japanese, SI units, force, work, energy, power, etc.
- [3] Basics: sensor signal processing
- [4] Basics: statistical processing, filtering
- [5] Basics: spectral analysis, wave form analysis, multivariable analysis
- [6] Position sensor
- [7] Displacement sensor
- [8] Force sensor
- [9] Acceleration sensor
- [10] Image sensor
- [11] Other sensors: ion sensor, gas sensor, electronic noses, electronic tongue
- [12] Active learning: survey
- [13] Active learning: presentation
- [14] Design of robot sensor systems
- [15] Summary