

# Robotics

Syllabus Number

1H305

Special Subjects

Elective 2 credit

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## 1. Course Description

In this course, students will learn the basics of robotics: mechanism, sensor, actuator, and kinematics. In addition, the latest robots will be introduced. (Related to DP2 and DP4)

## 2. Course Objectives

The aim of this course is to learn the basics of robotics, particularly the kinematics.

## 3. Grading Policy

Reports (20%) and final examination (80%)

Answer of reports will be explained in next lecture.

## 4. Textbook and Reference

Reference

Japanese book (ISBN: 978-4627913820)

## 5. Requirements(Assignments)

Teaching materials will be shown on LMS. Student must prepare for next lecture by it (1.5 hours).

## 6. Note

## 7. Schedule

- [1] Introduction
- [2] Robot sensor 1: Robot control and sensor
- [3] Robot sensor 2: rotary angle sensors
- [4] Robot sensor 3: Force sensors
- [5] Robot sensor 4: gyro/acceleration sensors
- [6] Robot actuator 1: classification and comparison of actuators
- [7] Robot actuator 2: DC motor
- [8] Robot actuator 3: gear reducer
- [9] Robot actuator 4: other actuators
- [10] Robot kinematics 1: mechanism of robot arm
- [11] Robot kinematics 2: Forward kinematics
- [12] Robot kinematics 3: Inverse kinematics
- [13] Robot kinematics 4: Jacobian matrix and singularity
- [14] Recent Topics
- [15] Final examination and summary