

# Exercises in Robotics1

Syllabus Number

1H301

Special Subjects

Elective 1 credit

YAMANE, Ken

## 1. Course Description

Each student will build an autonomous mobile robot and tackle the following tasks.

- (1) Fundamental task
- (2) Automated traveling task
- (3) Maze task
- (4) Line trace task

## 2. Course Objectives

The aim of this class is to understand intelligent automated machines. Through exercises students will build autonomous mobile robots and obtain fundamental skills and the knowledge of mechanics, electronics, and computer science.

## 3. Grading Policy

Students are evaluated based on the achievement of objectives and tasks.

## 4. Textbook and Reference

Textbook

Textbooks, robot kits, tools and computers are prepared.

## 5. Requirements(Assignments)

Students are required to pay 3,000 JPY for this lecture.

## 6. Note

## 7. Schedule

Introduction: history of robots, etc.

Fundamentals of robot making: checking your robot kit and setting up your software development environment

Fundamentals of robot making: assembling a basic robot

Fundamentals of robot making: programming and testing

Fundamentals of robot making: running forward and turning (fundamental task)

Basic task: programming using conditional statements (If-then-else construct)

Basic task: utilizing an ultra-sonic sensor

Basic task: programming for obstacle-avoided problem

Basic task: obstacle avoidance task

Basic task: maze task

Advanced task: utilizing infrared sensors

Advanced task: tuning each sensor's position and sensitivity

Advanced task: line trace task (course I, II)

Advanced task: line trace task (course III, IV)

Summary