

Experiments of Electronics2

Syllabus Number

3E316

Basic Major Subjects

Elective Requisites 2
credit

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1. Course Description

This is a hands-on course on the theory and practice of developing embedded systems. It also enhances the development of student's skill in making oral presentation and electrical work techniques. Specifically, we will acquire necessary skills and knowledge on DP2 and DP4E.

2. Course Objectives

By the end of the course, students are to:

- be able to program Arduino using Arduino IDE and to operate its peripheral devices.
- be able to implement Arduino using various peripheral devices and communications devices.

3. Grading Policy

Your overall grade in the class will be decided based on the following:

- Oral presentation in the demonstration lesson (performed in 7th, 11th and 14th (or 15th) classes): 40%
- The teaching tool developed for the demonstration lesson: 40%
- Quizzes in the classes: 20%

4. Textbook and Reference

Textbook

The handout of each class will be posted on the course website.

The slide-sheets of each class will be posted on the course website after the class.

5. Requirements(Assignments)

Preparation: Understand Arduino source code in the handout, and put comments to the source code (90 minutes).

Review: Understand the circuit diagram learned in the class (90 minutes).

6. Note

- This course will be taught in Japanese.
- This course will require the fundamental knowledge on electronics devices. We highly recommend to take "Electronics Devices (Information and Electronic Engineering · 2nd semester)".

7. Schedule

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| [1] | Guidance |
| [2] | Digital I/O Ports of Arduino |
| [3] | A/D Converter and D/A Converter |
| [4] | Pulse Width Modulation (PWM) |
| [5] | Serial Communication 1: UART (Universal Asynchronous Receiver/Transmitter) |
| [6] | Serial Communication 2: I2C (Inter-Integrated Circuit) |
| [7] | Presentation 1: My Demonstration Lesson on Embedded System |
| [8] | Planning the Demonstration Lesson |
| [9] | A Teaching Tool for the Demonstration Lesson |
| [10] | Try the Demonstration Lesson! |
| [11] | Presentation 2: Notice of My Demonstration Lesson |
| [12] | Planning Actual Demonstration Lesson |
| [13] | Tool for Actual Demonstration Lesson |
| [14] | Actual Demonstration Lesson 1 (Group 1) |
| [15] | Actual Demonstration Lesson 1 (Group 2) |

Note that some part of the course contents might change due to the situations.