

Electronics Devices

Syllabus Number

3E328

Special Subjects

Elective 2 credit

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1. Course Description

The aim of the class is students be able to understand how various electronic devices work. It will be learned the principles and technologies of integrated circuits and displays, which are the basis of modern technologies that require electronic devices. Specifically, we will acquire necessary skills and knowledge on DP4E.

2. Course Objectives

1. Students be able to explain the principles and techniques of various electronic devices.
2. Students be able to explain the physical characteristics of electronic devices and semiconductors.
3. Students be able to explain the outline and operating principle of integrated circuits.

3. Grading Policy

Evaluation is based on 70% test, 20% report, and 10% presentation. The presentation will be a report of the matters investigated in the group work.

An example of the answer for Test 1 will be explained in the 9th class, and an example of the answer for Test 2 will be posted on the LMS. It will be give feedback on test answers that are important to the evaluation.

4. Textbook and Reference

Textbook

The teaching materials will be posted on the LMS by the teacher. The materials will be posted on the LMS at least 2 days before class.

Reference

It will be introduced as needed in class.

5. Requirements(Assignments)

The materials used in the class will be posted on the LMS at least two days in advance, so please prepare the teaching materials thoroughly before attending the class. (about 1 hour)

Please make an out-of-lesson report by reviewing the lesson and investigating related matters. (about 2 hours) It will be student submit an out-of-lesson report.

6. Note

Lessons are mainly lecture-style, but we ask you to create an out-of-lesson report that investigates related items.

Have them investigate and present related items in group work.

Student need to take both tests 1 and 2. Absences without contact will not be credited.

Since the lesson content has changed recently, it may be reviewed depending on the situation.

7. Schedule

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| [1] | Guidance and overview of electronic devices |
| [2] | Semiconductors and diodes: types of semiconductors and diodes, principle. |
| [3] | Action of the diode: diode rectification, light emitting diode |
| [4] | Transistor: principle of signal amplification, transistor type, bipolar transistor |
| [5] | Metal-semiconductor contact: Schottky barrier, principle of ohmic contact |
| [6] | MISFET and MOSFET: field effect transistor, operating principle, type |
| [7] | Feedback on diode and transistor. Group work survey presentation. |
| [8] | Test 1 (lesson from 1st to 7th), Submission of out-of-lesson reports, Summary. |
| [9] | Image sensor: principles of CCD and CMOS. Explanation of test 1. |
| [10] | Memory and recording: semiconductor memory, magnetic recording, optical recording |
| [11] | Display: types, principle of CDT and FPD |
| [12] | Optical device: action of photons and semiconductors, light emitting diodes, laser diodes, solar cells |
| [13] | Integrated circuit: type, silicon wafer, manufacturing method |
| [14] | Feedback on various electronic devices. Group work survey presentation. |
| [15] | Test 2 (lesson from 9th to 14th), Submission of out-of-lesson reports, Summary. |