

Communication Systems

Syllabus Number

3E327

Special Subjects

Elective 2 credit

MURO KOICHI

1. Course Description

The aim of this course is to help students acquire an understanding of the communication systems as a mechanism for communicating audio and video to a distant place. Students will learn about mobile and optical communication technologies and systems that are the basis of today's information society. Specifically, we will acquire necessary skills and knowledge on DP4E.

2. Course Objectives

1. Students be able to explain the outline of communication systems and typical technologies.
2. Students be able to explain the mechanism of analog modulation / demodulation and digital modulation / demodulation.
3. Students be able to explain the relay method that is indispensable for microwave communication.
4. Students be able to explain the principles and performance indicators of radar.

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

Kazuaki Yoshimura ISBN-13:978-4274222566)in Japanese. Ohmsya, Ltd.

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

- [1] Guidance and overview of communication system
- [2] Necessity of modulation and demodulation, and typical methods
- [3] Analog frequency modulation and demodulation: example of FM broadcast
- [4] Basics of digital modulation: peripheral technology, modulation method, theorem
- [5] Phase shift modulation of digital modulation: phase, modulation, transmission speed
- [6] Digital demodulation: demodulation, playback, demodulation method
- [7] Feedback on modulation and demodulation. Group work survey presentation.
- [8] Test 1 (lesson from 1st to 7th), Submission of out-of-lesson reports, Summary.
- [9] Basics of multiplex communication method and units used for communication system. Explanation of test 1.
- [10] Multiplex communication method used for mobile phone communication
- [11] Relay method 1: ground microwave relay system
- [12] Relay method 2: satellite communication system
- [13] Radar: example of pulse radar
- [14] Feedback on communication method and radar. Group work survey presentation.
- [15] Test 12(lesson from 9th to 14th), Submission of out-of-lesson reports, Summary.