

# 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 fundamental principles of communication systems. It also enhances the development of student's skill in carrying out experiments on communication systems. Specifically, we will acquire necessary skills and knowledge on DP4E.

## 2. Course Objectives

The goals of this course are to:

- be able to understand and explain the features of microwave communication.
- be able to understand and explain the features of common multiple accesses.
- be able to understand and explain common modulation techniques.
- be able to understand and explain microwave relay systems.
- be able to understand and explain RADAR systems.

## 3. Grading Policy

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

- Mid-term examination: 40%
- Term-end examination: 40%
- A fraction of in-class contribution: 20%

## 4. Textbook and Reference

Textbook

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

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

## 5. Requirements(Assignments)

- This course will be taught in Japanese.
- This course will require the fundamental knowledge of the Fourier transformation. In case of difficulties, it is recommended to ask without reserve any questions to instructor.

## 6. Note

## 7. Schedule

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|------|---|
| [1]  | Guidance and the Basics of Waves  |
| [2]  | An Overview of Modulation   |
| [3]  | An Analog Modulation (FM)   |
| [4]  | [Lecture and Experiment]: An Overview of Digital Modulation (ASK, FSK, PSK) |
| [5]  | The Features of PSKs  |
| [6]  | Feedback on Modulation  |
| [7]  | Mid-Term Examination and Summary  |
| [8]  | Pulse Code Modulation   |
| [9]  | An Overview of Multiple Accesses 1 (TDMA, FDMA, CDMA)                       |
| [10] | An Overview of Multiple Accesses 2 (CDMA)                                   |
| [11] | Microwave Relay Systems   |
| [12] | Satellite Communication Systems   |
| [13] | [Lecture and Experiment]: Radio Detection and Ranging (RADAR) Systems       |
| [14] | Feedback on Communication Systems   |
| [15] | Final Examination and Summary   |