

Communication Engineering

Syllabus Number

4F301

Special Subjects

Elective 2 credit

MURO KOICHI

1. Course Description

The aim of the class is student be able to understand the mechanism of communicating information such as audio and video to a distant place. It will learn about the basic technologies and mechanisms used in communication methods such as telecommunications, mobile communications, and microwave communications that we use. And will learn about analog / digital modulation, communication system configurations, and key technologies.

Specifically, we will acquire necessary skills and knowledge on DP2 and DP4.

2. Course Objectives

1. Student be able to explain the outline of the communication method and typical techniques.
2. Students be able to explain the features of microwave communication and an overview of typical multiplex communication methods.
3. Students be able to explain the mechanism of analog modulation, demodulation and digital modulation, and demodulation.
4. Students be able to explain the relay method that is indispensable for microwave communication.
5. Students can explain the principles and performance indicators of radar.

3. Grading Policy

Those who pass both the reports [Report A] and [Report B] will be eligible to take the test. Grades will be evaluated by the test.

It will be provided feedback (understanding the content and pointing out insufficient points as technical sentences) by correcting the report assignment.

4. Textbook and Reference

Textbook

Classes are conducted with textbooks and subtexts. Subtext will be uploaded to LMS.

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

Hatori, Sugawara, Yatugi, Kobayashi and Izumi (ISBN-13: 978-4339007909) in Japanese. CORONA PUBLISHING CO.,LTD.

5. Requirements(Assignments)

Follow the instructions posted in the lesson content to study.

It will expected about 4.5 hours for each lesson study, study of related matters and exercises.

6. Note

In the test, examinee can bring textbooks, study notes, assignment reports, and scientific calculators. But examinee will couldn't pass the answer by reading the textbook during test. Therefore, examinee need a well prepared for the test.

This class is one of the exempted subjects for the qualification exam. (20T~16T) For details, please see the course requirements.

7. Schedule

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| [1] | Basics of telecommunications: basics of electromagnetic wave engineering and antenna gain |
| [2] | Radio wave propagation: high-frequency radio waves, visible distance |
| [3] | Analog modulation: example of frequency modulation |
| [4] | Outline of digital modulation method |
| [5] | Mechanism of digital modulator |
| [6] | Mechanism of digital demodulator |
| [7] | Noise figure: wireless receiver performance |
| [8] | Multiplex communication method: pulse code modulation communication method |
| [9] | Multiplexing: characteristics of pulse code modulated wave, transmission rate and modulation rate. |
| [10] | Code division multiple access: mobile wireless communication |
| [11] | Relay method 1: microwave relay system on ground |
| [12] | Relay method 2: satellite communication system |
| [13] | Radar: mechanism and performance indicators, example of pulse radar |
| [14] | Review 1: review the issues pointed in the returned [Report A] |
| [15] | Review 2: review the issues pointed in the returned [Report B] |