

Wireless Information and Communication Engineering

Special Subjects
Elective 2 credit

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1. Course Description

In the current information and communication society, a wireless communication is an indispensable technology. The aim of the class is student be able to understand the mechanism of wireless information communication. It will be learn about the technologies and mechanisms used in wireless information communications such as mobile communications, radio propagation, antenna engineering, modulation and demodulation.

Specifically, we will acquire necessary skills and knowledge on DP3.

2. Course Objectives

1. Students be able to explain the outline and technology of wireless information communication.
2. Students be able to explain the characteristics of radio wave propagation.
3. Students be able to understand and explain the structure of the antenna.
4. Students be able to explain the modulation and demodulation of analog and digital signals.
5. Students be able to explain the connection method in wireless information communication.

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

Tadahisa Yoshikawa (ISBN-13: 978-4890192977) in Japanese. Nihon Riko Shuppankai

Reference

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

The problem collection will be posted on the LMS. It is related to the test, so please practice enough.

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 study notes and scientific calculators. But textbooks and workbooks cannot be brought in. Therefore, examinee need a well prepared for the test.

7. Schedule

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| [1] | Overview of wireless information communication and device. |
| [2] | Radio wave propagation 1: wavelength and frequency of electromagnetic waves, types and characteristics of radio wave propagation. |
| [3] | Radio wave propagation 2: diffraction and fading of radio waves |
| [4] | Antenna 1: types and characteristics of antennas and feeders |
| [5] | Antenna 2: directivity and gain of antenna. |
| [6] | Antenna 3: types and characteristics of linear antennas, Yagi-Uda antenna. |
| [7] | Antenna 4: types and characteristics of 3D antennas, parabolic antennas. |
| [8] | Communication method 1: analog and digital communication |
| [9] | Communication method 2: information digitization, pulse code modulation |
| [10] | Communication method 3: modulation and demodulation of analog signals |
| [11] | Communication method 4: modulation and demodulation of digital signals |
| [12] | Communication method 5: spread spectrum modulation |
| [13] | Communication method 6: multiplex communication method and multiple access method |
| [14] | Review 1: review the issues pointed in the returned [Report A] |
| [15] | Review 2: review the issues pointed in the returned [Report B] |