Optical Information Science

Syllabus Number 4D305
Special Subjects
Elective 2 credit

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1. Course Description

The development speed of internet technology during the past several decades is remarkable, and the ubiquitous society becomes general for all people. Everybody knows "net" which means internet. But, optical transmission system which contains optical fiber and related devices are not well known. In this class, the basic technology of the optical fiber system are explained. This lecture corresponds to DP4.

2. Course Objectives

Students will understand that optical fiber system has 3 major items such as optical fibers, light sources, and light detector. And for long distance transmission, amplifier and recovery signal systems are indispensable.
Students will understand both of optical physics and optical fiber transmission function.

3. Grading Policy

Two tests 40% (20% each time)
Final test 60%

4. Textbook and Reference

Textbook
Reference book
『光ファイバ通信のしくみがわかる本』ISBN4−7741−1436−7

5. Requirements(Assignments)

Students must bring their own scientific calculator.

6. Note

7. Schedule

[1] Abstracts; optical fiber and its system
[2] Optical physics; rectilinear propagation of light. Diffraction and interference
[3] Structure of the optical fiber
[4] Optical transmission loss; structure factor and material factors
[5] Raw material of optical fiber and manufacturing method
[6] Laser
[7] Some devices required in optical transmission
[8] Optical switch, multiplexer and demultiplexer
[9] Transmission loss ; dB
[10] Long distant transmission system and amplifiers
[11] Photon; particle property
[12] Coherent
[13] Photonic crystal
[14] Future of the optical fiber
[15] summary and test