

Advanced Theory of Digital Transmission

2 units (selection)

Atsushi Takada · PROFESSOR / ELECTRICAL AND ELECTRONIC SYSTEMS, ELECTRICAL AND ELECTRONIC ENGINEERING, SYSTEMS INNOVATION ENGINEERING

Target Understanding analysis of digital transmission system and primary design techniques of a transmission system.

Outline For understanding practical digital wireless/cable transmission systems, transmission theory on coding, digital modulation/demodulation, equalization, noise, error generation is given. Furthermore, optical fiber transmission systems are discussed. Style Lecture.

Style Lecture

Keyword *digital modulation, data transmission, transmission system, optical fiber transmission*

Fundamental Lecture “Communication Systems”(1.0), “Applied Communication Engineering”(1.0), “Computer Networks”(1.0)

Relational Lecture “Advanced Theory of Electrical Communication”(0.5)

Requirement Students are required to have a good understanding of undergraduate-level communication engineering and related subjects.

Notice have preparation and reviewal for 2 hours on every lecture.

Goal

1. Understanding theory and architecture of digital transmission system and limiting factors of transmission performance.
2. Understanding the techniques designing simple digital transmission system.

Schedule

1. Overview of digital transmission
2. Source coding and coding noise
3. Digital multiplexing
4. Transmission code
5. Repeated transmission and code error
6. Digital modulation/demodulation
7. Shot noise and thermal noise
8. Noise and code error rate
9. Basic technology of optical transmission
10. Noise in optical transmission
11. Optical amplification
12. Wavelength division multiplexing (WDM) transmission
13. Limiting factors of WDM transmission system performance

14. Waveform equalization and error rate

15. Examination

16. Summary

Evaluation Criteria reports 25%, examination 75%. Total of 60 % is required to pass the class.

Textbook Prints

Reference

- ◇ K. Miyauchi ”Communication System”(Corona Pub.) in Japanese
- ◇ I. Kobayashi ed. ”Optical fiber communications (1)(2)”(Corona Pub.) in Japanese

Contents <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216772>

Student Able to be taken by only specified class(es)

Contact

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