



School of Electrical Engineering & Computer Science
Kyungpook National University

SPECIAL TOPICS IN DIGITAL COMMUNICATIONS

Autumn, 2009

- **Instructor:** Dong Seog Han
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- **Text**
 - [1] Dong Seog Han, Lecture Note (available on the web <http://abeek.knu.ac.kr>)
- **References**
 - [1] E. A. Lee and D. G. Messerschmitt, *Digital Communication, 3rd ed.*, Kluwer Academic, 2004.
 - [2] J. G. Proakis, *Digital Communications, 4th ed.*, McGraw-Hill, 2000.
 - [3] J. G. Proakis, *Contemporary Communication Systems Using MATLAB*, PSW, 1998.
- **Grade**

	Percentage	Date
Mid-term Exam	30%	
Final Exam	30%	
Home Work	30%	
Learning Participation (homework etc.)	10%	

Learning Participation: It involved all aspect of teaching-learning interaction. It includes attendance, in-class activities (e.g., quizzes, questions) as well as out –of-class activities (e.g. problem assignments).

- **Keep in mind**
 1. If you couldn't take exam, please talk to me before the exam!
 2. Attend every class! If you have some reasons that can't attend classes please let me know.
 3. Keep the due day of reports!
 4. Feel free to contact me.

- **PURPOSE OF THE COURSE**

1. Understand the mathematical theory of signals and systems for modern digital communication systems
2. Understand theories on mobile and fixed digital communication systems.
3. Introduce new technologies on modern communications networks.

- Lecture Schedule

Week	Contents
1	Introduction, Sampling theory
2	Fourier Transform, Power spectrum
3	Baseband communication: Line coding, Pulse shaping
4	Probabilistic Detection, White noise, Matched filter
5	Digital Modulation I- BPSK, QAM, DQPSK
6	Digital Modulation II- CPFSK, GMSK
7	Channel capacity
8	Midterm exam
9	Channel Coding & Decoding- Block code
10	Channel Coding & Decoding- Convolutional code, TCM
11	Channel equalization- Fading, LMS algorithm
12	OFDM Technology
13	MIMO communications
14	Synchronization- Timing & carrier recovery
15	Final Exam

- Outline of the course

