| Course Title | Advanced Digital Communications | Course Code | ELEC741001 | Credits | 3.0 |
|---|---|---|---|---|---|
| Department | 전자공학부 | Semester | 20172 | Course Categories | 전공 |
| Instructor | HAN, DONG SEOG | Hours | 토 1A1B2A<br>토 2B3A3B | Location | IT 대학 1 호관(공대 10 호관)513<br>IT 대학 1 호관(공대 10 호관)513 |
| Phone/E-mail | ** 통합정보시스템 로그인- 수업/성적- 수업- "강의담당교수조회"에서 확인 가능함. | | | | |
| Office Hours | Just after every lecture | | | language | 한국어 |

## [ Syllabus ]

### Course Goals and Objectives

In this lecture, general theories of digital communication systems will be handled from transmission to reception with specific communication specifications. The concepts of channel coding and single carrier modulation will be covered. OFDM and MIMO technologies will also be considered . They are key technologies for recent communication systems.

The vehicle communication systems will be covered as an example system. IEEE802.11a and IEEE802.11p PHY's will be handled to make understand theories easily through real systems. They are international standards for wireless LAN and vehicular communications.

### Textbook and other references

[Text] Lecture notes and Papers

[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. 한동석, 원리로 이해하는 통신이론, 한빛아카데미 2015.

### Course Description, Methods, and Materials

Beam project and whiteboard will be used.

Every class may be videotaped to help student's self study.

### Assignments, Grading Criteria, Prerequisite Subject

Midterm: 40 % Final exam: 40 % Home Work: 10 % Quiz: 10 %

Notice To Students

- The lecture will be delivered in English.

- Girl student is permitted to be the leader of team project and induced to make questions at higher frequency.

- Same number of questions will be given to female and male students.

Notice To Students with Disabilities

A. Hearing Impaired : first row priority seating, Class transcripts may also be provided.

B. Developmentally Challenged : Extended Test Period

C. Brain lesions : Extended Test Period, Class transcripts may also be provided

D. Visually Impaired : Larger Font test will be provided

Other : Aid offered dependant on specific disabilities

## [ Course Lesson Plan ]

| no | Course Goals and Objectives | Assignment | Text & Materials | Etc. |
|---|---|---|---|---|
| 1 | Introduction, Sampling theory | | | |
| 2 | Fourier Transform, Power spectrum | | | |
| 3 | Baseband communication: Line coding, Pulse shaping | | | |
| 4 | Probabilistic Detection<br>Witenoise<br>Matchedfilter | | | |
| 5 | IEEE8021.11a / IEEE802.11p PHY<br>-DigitalModulationI-BPSK,QAM,DQPSK | | | |
| 6 | Digital Modulation II- CPFSK, GMSK | | | |
| 7 | Channel capacity | | | |
| 8 | Midterm exam | | | |
| 9 | IEEE8021.11a / IEEE802.11p PHY | | | |

| | | | | |
|---|---|---|---|---|
| | -ChannelCoding&Decoding-Block code | | | |
| 10 | Channel Coding & Decoding- Convolutional code, TCM | | | |
| 11 | Channel equalization- Fading, LMS algorithm | | | |
| 12 | OFDM Technology<br>-IEEE8021.11a/IEEE802.11pPHY | | | |
| 13 | MIMO communications | | | |
| 14 | MIMO communications & LTE | | | |
| 15 | Final Exam | | | |

Cheating, plagiarism, and other dishonest practices will be punished as harshly as Kyungpook National University policies allow. The University specifies that cheating is grounds for dismissal. Penalties less severe may be imposed instead. A list of possible disciplinary actions is given below. Actions by the university:

-Failureincourse

-Suspensionfromuniversityforadesignatedperiod

-Expulsionfromuniversity