* 참고자료 : Syllabus Sample

<table>
<tr><td rowspan="3">Course Information</td><td>Course Title</td><td colspan="2">Communication Systems</td><td>Course ID</td><td>ECE 3312</td></tr>
<tr><td colspan="3"></td><td>(Course Type)</td><td>Selective Course</td></tr>
<tr><td colspan="2">(Credit/ hours per week)</td><td>3/3</td><td>Version (date)</td><td>3.0 (2021)</td></tr>
<tr><td>Instructor</td><td colspan="5">PROF. Jaehak Chung</td></tr>
<tr><td rowspan="4">Course Learning Objective</td><td colspan="3">Course Objectives</td><td colspan="2">Relation with Program Outcomes</td></tr>
<tr><td>1</td><td colspan="2">Understand the modulations and demodulation of analog and digital communications.</td><td colspan="2">PO 1, 3</td></tr>
<tr><td>2</td><td colspan="2">Understand the analysis and evaluations of the communication systems.</td><td colspan="2">PO 4,5,7</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>Course Description</td><td colspan="5">This course focuses on the basic knowledge of communication systems. To understand the contents, signal and systems, linear system, random variables and process are reviewed. Then, the fundamental knowledge, analysis, evaluations of the analog and digital communication technologies are presented.</td></tr>
<tr><td rowspan="7">Course Outcomes</td><td>NO</td><td colspan="4">Details</td></tr>
<tr><td>1</td><td colspan="4">an ability to apply knowledge of mathematics, basic science, engineering, and information technology to the solution of engineering problem</td></tr>
<tr><td>3</td><td colspan="4">an ability to define and formulate engineering problem</td></tr>
<tr><td>4</td><td colspan="4">an ability to apply latest information, research-based knowledge, and appropriate tools to the solution of engineering problems</td></tr>
<tr><td>5</td><td colspan="4">an ability to design systems, components and processes within realistic constraints</td></tr>
<tr><td>7</td><td colspan="4">an ability to communicate effectively under diverse situations</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>prerequisite</td><td colspan="5">Signal and systems and Random Probability are helpful.</td></tr>
<tr><td>(Recommended Courses after this Course)</td><td colspan="5">Digital Communications, Mobile Communications</td></tr>
<tr><td>Course Software or Tool</td><td colspan="5">None</td></tr>
<tr><td rowspan="2">Textbook</td><td>Title</td><td>Authors</td><td>Publisher</td><td>Place</td><td>Year</td><td>ISBN</td></tr>
<tr><td>Communication Systems (7th Edition)</td><td>Rodger E. Ziemer, William H. Tranter</td><td>Wiley</td><td>-</td><td>2015</td><td>978-1-118-07891-4</td></tr>
<tr><td>References</td><td colspan="5">N/A</td></tr>
<tr><td>Lecture type</td><td colspan="5">Lecture</td></tr>
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(Notes)	**Attendance Policy** - All students are required to attend the classes. - Students who are absent ¼ or more than the assigned hours for the course without any valid reason will have a'F'grade.							
(Evaluation Criteria)	(Attendance)	10 %	(Homework)	10 %	(Midterm Exam)	40 %	(Final Exam)	40%
					(Total)		100 %	
(Methods of Evaluation)	Midterm and final exams test how much the students understand the course contents. The exams include simple questions, derivations, and problem statements..							

Communication systems Syllabus

Weekly Topical Outlines of the Course		
(1st Week)	Topic	Introduction to communication systems
	Contents	Learn current modern communication technologies and fundamental communication blocks.
	etc	none
(2nd Week)	Topic	Signal and linear system analysis 1
	Contents	- Review the fundamental knowledge of the definitions and applications of signal and systems. - Signal model, convolution, Fourier Series/Transform, Sampling theory, etc.
	etc.	none
(3rd Week)	Topic	Signal and linear system analysis 2
	Contents	- Review the fundamental knowledge of the definitions and applications of signal and systems. - Power spectral density and correlation, linear time invariant system, sampling theory, Hilbert transform, etc.
	etc.	Homework assignment 1
(4th Week)	Topic	Linear modulation techniques 1
	Contents	- Learn linear modulation such as AM, DSB, SSB - Double-sideband modulation, Amplitude modulation, Single-sideband modulation, Vestige-sideband modulation, frequency translating and mixing, etc.
	etc.	none
(5th Week)	Topic	Linear modulation techniques 2
	Contents	- Learn other topics of linear modulations - Interference and linear modulation, multiplexing, etc.
	etc.	none

(6th Week)	Topic	Angle modulation techniques
	Contents	- Learn PM, FM - Phase/frequency modulation/demodulation, PLL interference, etc.
	etc.	Homework assignment 2
(7th Week)	Topic	Probability and random variables 1
	Contents	- Review random variables – Probability, random variable, transform, etc.
	etc.	none
(8th Week)	Topic	MID-TERM EXAM
	Contents	none
	etc.	none
(9th Week)	Topic	Probability and random variables
	Contents	- Review mean, variance, characteristic functions – Statistical average, some useful pdfs, etc.
	etc.	Homework assignment 3
(10th Week)	Topic	Random signals and noise 1
	Contents	- Learn random process – Some terminologies of random process, correlation and power spectral density, etc.
	etc.	none
(11th Week)	Topic	Random signals and noise 2
	Contents	- Learn other random process topics. - linear system and random process, narrow band nose, etc
	etc.	none
(12th Week)	Topic	Noise in modulation systems
	Contents	- Learn digital data processing gain - SNR gain for the post processing, noise in pulse coded modulations, etc.
	etc.	Homework assignment 4
(13th Week)	Topic	Digital data transmission in noise 1
	Contents	- Learn how to transmit digital data – baseband transmission in white gaussian noise, etc.
	etc.	none
(14th Week)	Topic	Digital data transmission in noise 2

	Contents	- Learn how to detect binary received data – binary synchronous data transmission with arbitrary signal shapes, modulation scheme, coherent detection, etc.
	etc.	none
(15th Week)	Topic	Digital data transmission in noise 3
	Contents	- Learn the wireless channel and its characteristics. -Wireless channels, fading, multi-path interference, etc
	etc.	Homework assignment 5
(16th Week)	Topic	Final Exam
	Contents	none
	etc.	none