

EE 320: Communication Principles
First Semester (1447 H)

Instructor Contact Information:

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Course Pre-requisite: EE 301-Signals and systems

Course Material: Will be available on LMS

Textbook:

Simon Haykin and Michael Moher, An introduction to Analog and Digital Communication, John Wiley, 2007.

References:

B.P Lathi, Modern Digital and Analog Communication Systems, Oxford University Press, New York, 3rd edition, 1998.

John G Proakis and Masoud Salehi, Fundamentals of Communication systems, Pearson Education, 2007.

Course Outline:

Ch # (Textbook)	Topics	Week #
1	Introduction: Historical Notes, Elements of Communication systems, Applications, Primary Communication Resources. System Design Parameters.	1
2	Fourier Representation of Signals and Systems: Continues-Time Fourier Transform (CTFT), CTFT properties, Dirac Delta Function, Unit Step function, Fourier Series, Signal Bandwidth (BW), LTI system response, Frequency Response, Correlation, Energy Spectral density, Power Spectral Density.	2,3
3	Amplitude Modulation: Amplitude Modulation (AM), Generation (Switching Modulator), Detection (Envelop Detector), Double Sideband-Suppressed Carrier (DSB-SC) Modulation, Generation (Product Modulator), Detection (Coherent Detector), Costas Receiver, Quadrature-Carrier Multiplexing, Single-Sideband (SSB) Modulation, Generation (Frequency and Phase Discrimination Methods), Vestigial Sideband (VSB) Modulation, VSB-Shaping Filter, Superheterodyne Receiver, Frequency-Division Multiplexing (FDM).	4,5,6,7 Mid#1 (SSB)
4	Angle Modulation: Phase Modulation (PM), Frequency Modulation (FM), Properties of Angle-Modulated waves, Relationship between PM and FM waves, Narrow-Band FM, Wide-Band FM, BW of FM, Generation and Detection of FM, FM Stereo Multiplexing.	8,9,10 Mid#2
5	Sampling and Pulse Modulation: Sampling Process, Analog Pulse Modulation (Pulse-Amplitude Modulation, Pulse-Width Modulation, Pulse-Position Modulation), Quantization Process, Digital Pulse Modulation (Pulse-Code Modulation, Delta Modulation, Differential Pulse-Code Modulation), Line Codes, Time-Division Multiplexing (TDM).	11,12,13
7	Introduction to Digital Band-Pass Modulation Techniques: Binary Amplitude-Shift Keying (BASK), Binary Phase-Shift Keying (BPSK), Quadrature-Shift Keying (QPSK), Binary Frequency-Shift Keying (BFSK).	14
-	Review	15

Grading Policy:

20% Class Quizzes

20% Mid#1 (8th week), Wednesday, 15/10/2025, CH1 --> CH3 (end of SSB)

20% Mid#2 (13th week), Sunday, 16/11/2025, CH3 (VSB) --> CH4 (end of generation of FM)

40% Final Exam

Office Hours: Sunday/Tuesday/Thursday 9:00-10:00 am (OFFICE: 2C-98)

Attendance Policy: 75% Attendance (Class+Tutorial)