	National Institute of Technology Meghalaya An Institute of National Importance		CURRICULUM
Programme	**Bachelor of Technology in Electrical and Electronics Engineering**	Year of Regulation	**2013-14**
Department	**Electrical Engineering**	Semester	**IV**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE222	**Communication Engineering**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives		Course Outcomes		
	To understand the basic concepts of communication engineering		CO1	Able to understand the concepts of communication, channel and communication terminologies
	To analyze and design communication system		CO2	Design of filter and distortion analysis in communication channel
			CO3	Select the methods of amplitude modulation and demodulation in communication
			CO4	Select the methods of angle modulation and demodulation in communication
			CO5	Analysis of various kind of noise present in the communication process

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**1**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**3**	**0**	**1**	**1**	**1**	**1**
2	CO2	**2**	**1**	**2**	**1**	**2**	**2**	**0**	**0**	**1**	**3**	**0**	**1**	**3**	**3**	**3**
3	CO3	**2**	**1**	**2**	**1**	**1**	**2**	**0**	**0**	**1**	**3**	**0**	**1**	**2**	**2**	**2**
4	CO4	**1**	**1**	**2**	**1**	**1**	**2**	**0**	**1**	**1**	**0**	**0**	**1**	**2**	**2**	**2**
5	CO5	**1**	**2**	**3**	**1**	**1**	**2**	**0**	**0**	**1**	**3**	**0**	**1**	**2**	**2**	**2**
6																

SYLLABUS

No.	Content	Hours	COs
I	**Transmission of Signals** Introduction to Various Terminologies: Transmitter, Receiver, Modulation, Carrier, Channel, Signal Transmission through a Linear System, Ideal versus Practical Filter, Signal Distortion Over a Communication Channel	**8**	**CO1** **CO2**
II	**Amplitude Modulation and Demodulation** Baseband vs Carrier Communications, DSB-C And DSB-SC Amplitude Modulation, Bandwidth Efficient AM: SSB, Vestigial Sideband (VSB) Transmission, Local Carrier Synchronization, Frequency Division Multiplexing, Phase Looked Loop and Some Applications.	**10**	**CO3**
III	**Angle Modulation and Demodulation** Nonlinear Modulation, Bandwidth of Angle Modulated Waves, Generating FM Waves, Demodulation of FM Signals, Effects of Nonlinear Distortion and Interferences, Super-Heterodyne Analog AM/FM Receivers, FM Broadcasting System	**10**	**CO4**
IV	**Noise** Various Types of Noises: Internal (Shot, Thermal, Agitation, Transit Time) Noise and External (Atmospheric, Extra-Terrestrial, Industrial) Noise, Available Power, White Noise and Filtered Noise, AWGN Properties, Noise Equivalent Bandwidth Concept, Signal to Noise Ratio.	**8**	**CO5**
Total Hours		**36**	

Essential Readings

1. B.P. Lathi, and Zhi Ding, “Modern Digital and Analog Communication Systems”, Oxford University Press, 4th Edition, 2011
2. J. G. Proakisand M. Salehi, “Fundamental of Communication Systems”, Pearson Education, 1st Edition, 2004.

Supplementary Readings

1. Sanjay Sharma, “Communication Systems (Analog and Digital)”, S. K. Kataria & Sons, 6th Edition, 2012.
2. A. Bruce Carlson, “Communication Systems- An Introduction to Signal and Noise in Electrical Communication”, McGraw-Hill Education, 2nd Edition, 1986.
3. Leon W. Couch, “Digital and Analog Communication Systems”, Pearson Education, 8th Edition, 2012.
4. Herbut Taub and Donald L. Schilling, “Principal of Communication Systems”, Tata McGraw-Hill Education, 4th Edition, 2017.