Program : **Diploma in Electronics / Electronics & Communication Engineering**	
Course Code :**3042**	Course Title: **Principles of Electronic Communication**
Semester :**3**	Credits: **3**
Course Category: **Program Core**	
Periods per week: **3(L:2 T:1 P:0)**	Periods per semester:**45**

Course Objectives:

- To introduce the concept of electronic communication.
- To introduce the principle of amplitude modulation, frequency modulation, pulse modulation schemes.
- To summarize the working principles and role of antennas in communication.
- To summarize the working principles of transmitters and receivers.

Course Prerequisites:

Topic	Course code	Course name	Semester
Active and passive components.		Fundamentals of Electrical and Electronics Engineering	2
Power, rms values, peak values.			
Integration, differentiation, trigonometry and mathematical representation of signals.		Mathematics I & II	1 & 2
Amplifiers, Oscillators and Switching circuits		Electronic Circuits	3

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive level
CO1	Solve for various parameters of Amplitude Modulation (AM) and Frequency Modulation (FM) techniques from the given signal parameters	11	Applying

CO2	Explain pulse modulation techniques and role of antennas in communication.	11	Understanding
CO3	Explain the working of AM and FM transmitters.	11	Understanding
CO4	Illustrate the working principle of AM and FM receivers.	10	Understanding
	Series Test	2	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	2						
CO3	2						
CO4	2						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Solve for various parameters of Amplitude Modulation (AM) and Frequency Modulation (FM) techniques from the given signal parameters**		
M1.01	Classify modulation techniques	1	Understanding.
M1.02	Interpret modulation parameters of different AM techniques	5	Understanding.
M1.03	Derive the expression for modulated signals and frequency spectrum of FM	3	Understanding.
M1.04	Solve for modulation index, bandwidth and power for various modulation schemes for given signal parameters	2	Applying

Contents:

Concept of modulation.

Amplitude Modulation: Definition, Expression of AM wave, Modulation index, AM wave representation, Bandwidth and power calculation, Frequency spectrum of AM, DSBSC, SSB and VSB.

Frequency Modulation: Definition, Mathematical representation of FM, Modulation

index, Frequency spectrum of FM. Comparison of AM and FM, Applications of AM and FM.			
CO2	**Explain pulse modulation techniques and role of antennas in communication.**		
M2.01	Explain the concept of sampling.	4	Understanding.
M2.02	Compare various pulse modulation techniques.	4	Understanding.
M2.03	Explain the role of antennas in communication system.	3	Understanding.
	Series Test – I	1	
Contents: **Sampling:**Sampling theorem and its significance. **Pulse Modulation Schemes:** PAM, PWM, PPM, PCM. **Antennas:** physical concepts of radiation of electromagnetic wave, radiation pattern,Antenna parameters, Microwave Antennas, Microstrip antennas and its applications.			
CO3	**Explain the working of AM and FM transmitters.**		
M3.01	Explain the working of radio transmitters (AM and FM).	5	Understanding
M3.02	Illustrate AM modulator circuits.	3	Understanding
M3.03	Explain noises in communication Systems.	3	Understanding
Contents: **AM transmitter:** AM Transmitter - low level and high level, AM collector modulator, Balanced modulator **FM transmitter**: FM Transmitter(Armstrong method), Pre-Emphasis and De-Emphasis circuits **Noise:** Definition, Types of noises - External and Internal, Signal to noise ratio			
CO4	**Illustrate the working principle of AM and FM receivers.**		
M4.01	Define the characteristics of radio receiver	2	Remembering
M4.02	Explain the working of radio receiver	6	Understanding
M4.03	Illustrate AM demodulator circuit with AGC	2	Understanding
	Series Test – II	1	
Contents: **Characteristics of radio receiver** - selectivity, sensitivity, fidelity and noise figure.			

Superhetrodyne receiver, AM receiver(block diagram only), choice of IF in receivers , FM receiver(block diagram only), comparison of FM and AM receiver **AM demodulator circuit**: diode detector, simple and delayed AGC.

Text/Reference:

T/R	Book Title/Author
T1	Electronic Communication Systems – George Kennedy – TMH
T2	Electronic communications - Roddy and Coolen – PHI
R1	Electronic Communication Systems - Frank R Dungan - 3rd Edition – Thomson
R2	Electronic Communication Systems - Wayne Thomasi.
R3	Communication Systems(Analog and Digital) – Sanjay Sharma
R4	Principles of Electronic Communications –Pradeep Kumar Ghosh

Online Resources:

Sl.No	Website Link
1	https://nptel.ac.in/courses/117/105/117105143/
2	https://www.slideshare.net/bhavyaw/noise-13468777