Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa

Name of Faculty: Mahendra R. Pednekar	**Subject:** Physics Core	
Paper code: PHY-221	**Program/Course: S.Y. B.Sc.**	**Division:**
Academic year: 2025 - 2026	**Semester: IV**	**Total Lectures: 45 + Practicals**

Course Objectives:
This course aims at providing an understanding of physics behind various types of electronic communication.

Course Learning Outcome: The students will be able to
1. Understand basics of electronic communication.
2.Understand Transmission lines and Antenna systems
3.Gain insights about fibre optic communication
4. Appreciate basics of satellite communication and Develop conceptual understanding of cellular communication.

Month	Lectures From:	To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning Outcome	ICT Tools	Reference books
December	01.12.25	06.12.25	03	Electronic communication: Introduction to communication systems. Need for modulation and frequency allocation for radio communication system. Electromagnetic	.1. Understand basics of electronic communication. 2.Understand Transmission lines and Antenna systems 3.Gain insights about fibre optic communication		1. Principles of Communication systems by Taub and Schilling 2. Modern Digital and Analog Communication systems By B.P.Lathi 3.Communication Engineering

				communication spectrum,	4. Appreciate basics of satellite communication and Develop conceptual understanding of cellular communication.		By U.A.Bakshi and A.P.Godse 4.Electronic Communications by Robert J. Schoenbeck Electronic Communications by Roddy Coolen
December	08.09.21	13.12.25	03	band designations and usage. Channels and base-band signals. Concept of Noise, signal-tonoise (S/N) ratio. Practical : Amplitude modulation and Demodulation	. .		
December	18.12.25	23.12.25	03	Analog Modulation: Amplitude Modulation, modulation index and frequency spectrum, Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation			

				(PM), modulation index and		
				Practical :Frequency Modulation and Demodulation		
January	02.01.26	10.01.26	04	frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Super heterodyne receiver.		
				Practical : Pulse amplitude modulation and demodulation		
January	12.01.26	17.01.26	03	Analog Pulse Modulation Channel capacity, Sampling theorem, Basic Principles of PAM, PWM, PPM modulation and detection technique for PAM only		
				Practical : Pulse width modulation		
January	19.01.26	24.01.26	03	Multiplexing 4 Transmission Lines and Antenna system Introduction, Transmission line, Constants, Characteristic impedance,		

				Propagation constant,			
January	27.01.26	31.01.26	03	Standing waves & SWR. Principles of radiation, Isotropic radiator, Hertzian dipole, Antenna gain, Directivity, Radiation resistance, Wave guides, RADAR Practical Repeat SET I			
February	02.02.26	07.02.26	03	Fibre Optics Optical fibres and their properties, Principal of light propagation through a fibre, refractive index profile, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres. Practical : Pulse position modulation			
February	09.02.26	14.02.26	03	Fibre Optic communication-basic principle, Transmission characteristics of optical fibre, attenuation,			

				absorption and scattering losses, nonlinear losses, wavelengths for communication, bend losses,			
				dispersion effects in optical fibres.			
February	16.02.26	21.02.26	03	Practical Amplitude shift Keying			
February	23.02.26	28.02.26	03	Digital Communication: Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), F Practical : Frquency shift keying			
March	2.03.26	07.03.26	03	Frequency Shift 6 Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK). Practical : Phase shift keying			
March	09.03.26	14.03.26	03	Satellite Communication Introduction,			

				Geosynchronous satellite orbits, geostationary satellite, advantages of geostationary satellites.			
				Practical :Fibre optic communication			
				Satellite visibility, ground station, Overview of Indian satellite missions.			
March	16.03.26	21.03.26	03	Practical : set II repeat			
				Cellular Communication Concept of cellular mobile communication – cell and cell splitting, frequency bands used in cellular communication, authentication of the SIM card of the subscribers, I			
March	23-03-26	28-03-26		Practical : Examination			
March	30.03.26	31.03.26	04	IMEI number, GSM and CDMA technology- an overview, simplified block			

				diagram of cellular phone handset, 2G, 3G,4G and 5G concepts			