

The Maharaja Sayajirao University of Baroda Polytechnic Diploma in Electronics & Communication Engg. (HPP)			ACADEMIC YEAR 2023-24		
Year	III	CORE / ELECTIVE / FOUNDATION SATELLITE COMMUNICATION (ELE3633)	Lecture /Tutorial Hrs per week	4/2	
Semester	II		Max marks	100	
Pre-Requisite: analog communication , Digital Communication					
CO1	Explain satellite evolution, launch vehicles, orbit types, and LEO/MEO/GEO/HEO principles.				
CO2	Describe satellite subsystems: mechanical, thermal, propulsion, power, AOCS, TT&C, payload, antennas.				
CO3	Analyze earth-station design, hardware components, tracking, and RAKE receiver operation.				
CO4	Evaluate satellite communication techniques: uplink/downlink, digital modulation, multiplexing, TDMA/FDMA/CDMA/OFDM.				
CO5	Summarize satellite-based applications such as telephony, TV, radio, data, remote sensing, navigation, weather, military.				
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation				
COURSE CONTENT/SYLLABUS					
Unit	Unit Name		Hrs	Weightage	CO
1	FUNDAMENTS SATELLITE COMMUNICATION Evolution of Satellites, Launching Vehicles, Satellite Services, Satellite Orbits and Trajectory system, Principles of Satellite Orbits, LEO, MEO, GEO, HEO, Geostationary Satellites		12	20	CO1
2	SATELLITE HARDWARE Mechanical Structure, Propulsion & Thermal Control Subsystems, Power Supply, Attitude and Orbit Control, Tracking, Telemetry and Command Subsystem, Payload, Antenna Subsystem.		12	20	CO2
3	SATELLITE EARTH STATION Types of Earth Station, Earth Station: Architecture, Hardware &Satellite Tracking system, RAKE Receiver.		6	12	CO3, CO4
4	SATELLITE COMMUNICATION TECHNIQUES Frequency Band of Uplink and Downlink, Review of Digital Modulation Techniques & Multiplexing Techniques, Comparisons of multiple Access Strategies TDMA, FDMA, CDMA, OFDM, Duplexing Techniques: TDD, FDD.		8	15	CO4
5	SATELLITE APPLICATIONS Satellite Telephony, Satellite Television, Satellite Radio, Satellite Data Communication Services, Remote Sensing Satellites, Navigation Satellites, Weather Forecasting Satellites, Military Satellites.		8	15	CO5
6	ADVANCED WIRELESS COMMUNICATION SYSTEMS Wireless Protocols: Wireless Fidelity (Wi-Fi system), Zig-Bee Protocol, Wi-Max Technology. Blue tooth techniques		10	18	CO5
			56	100	
REFERENCE BOOKS:					
1.	Satellite Communication- Anil K. Maini, Varsha Agrawal; Wiley				
2.	Satellite Communication, by Timothy Pratt, Charles Bostian, Jeremy Allnutt; Wiley Student edition.				
3.	Satellite Communication. by Dennis Roddy. Tata-McGraw Hill				