

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. SEMESTER: VII
INFORMATION & COMMUNICATION TECHNOLOGY

Subject Name: **Microwave and Satellite Communication**

Subject Code: **173201**

Theory	Teaching scheme		Total	University		Evaluation scheme	
	Tutorial	Practical		Exam	Exam	Mid Sem	Internal
				(Theory)	(Pract)	(Theory)	(I)
				(E)	(E)	(M)	
4	0	2	6	70	30	30	20

SR.NO	COURSE CONTENT
1	Introduction to Microwaves Microwave frequencies, Advantages of Microwaves and general applications of Microwaves
2	Microwave transmission lines Transmission line equations and solutions, Reflection and Transmission coefficient, Standing Wave and Standing Wave Ratio, Impedance Matching
3	Microwave waveguides Rectangular waveguides(with all necessary details and derivations)
4	Microwave Components and their S parameters Waveguide tees(E, H, Magic tees), Directional Couplers, Hybrid ring, Circulators and Isolators
5	Microwave Tubes and Circuits(without derivation) Limitations of conventional tubes at UHF and Microwave, Klystrons, Two cavity, Multi cavity and Reflex Klystron, Velocity modulation, Travelling Wave Tube, Magnetron, Backward Wave Oscillator
6	Semiconductor Microwave Devices and Circuits Microwave transistors and integrated circuits, Varactor diodes, Tunnel diodes and its applications, Gunn diode and its applications, IMPATT diode, TRAPATT diode, PIN diode, BARITT diode
7	Radar Systems Basic principle, Radar Range equation, Power and Frequencies used in Radar, Basic Pulsed Radar, Moving Target Indication, CW Doppler Radar, Factors influencing maximum range, Effect of noise, Pulsed System, Modulators, Receiver band requirements, Factors governing pulse characteristics, Antenna and Scanning,

	Display Methods, Search and Tracking Radar systems, Phased Array Radar, Planar Array Radar
8	Satellite Communication Kepler's Laws, Orbit Considerations, Orbital Mechanics, Definitions of terms related to earth Orbiting satellites, Attitude and Orbit Control System(AOCS), Telemetry, Tracking, Command and Monitoring(TTC & M), Power Systems, Communication Subsystems, Basic Transmission Theory.

Reference Books:

1. Microwave engineering, Sanjeev Gupta, Khanna Publ.
2. Microwave engineering, Kulkarni, Umesh publ.
3. Microwave Technology, Dennis Roddy, PHI
4. Microwave devices and circuits, Samuel Liao, PHI
5. Electronic communication, Dennis Roddy and Jhon Coolen, PHI

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