

GUJARAT TECHNOLOGICAL UNIVERSITY

Electronics Engineering / Electronics & Communication
Engineering / Electronics & Telecommunication Engineering

B. E. SEMESTER: VII

Subject Name: **Microwave Engineering**

Subject Code: **171001**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	0	2	5	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	Introduction to microwaves: Microwave frequencies, advantages of microwaves, general and Industrial applications of microwaves	1
2.	Microwave transmission lines and waveguides: Transmission line equations & solutions, reflection and transmission coefficient, standing wave and standing wave ratio, line impedance and admittance, impedance matching, using stub line, application of smith chart in solving transmission line problems Introduction to strip lines, Microstrip lines, parallel strip lines, coplanar strip lines, shielded strip lines , Rectangular waveguides-theory and analysis, principle of circular waveguide	15
3.	Microwave components & their s-parameters: Wave-guide tees, magic tees, wave-guide corners, bends, twists, directional couples, circulators and isolators. S Matrix and its applications in analyzing microwave components	5
4.	Microwave tubes and circuits: Limitations of conventional tubes at UHF & Microwave, Klystrons, velocity modulation, multicavity klystron, reflex klystron, traveling wave tube, Magnetron. (Without derivations).	8

5.	Semiconductor microwave devices and circuits: Microwave transistors and integrated circuits, varactor diodes, step-recovery diodes, parametric amplifiers, tunnel diode and its applications, Gunn diode and its applications IMPATT diode, TRAPATT diode, PIN diode, schottky barrier diodes.	8
6.	Radar systems: Basic principle, radar range equation: powers and frequencies used in radar, basic pulsed radar system, Factors Influencing maximum range, Effect of noise, Display Methods, Search and Tracking radar systems, Moving target indicator (MTI), CW Doppler Radar, Frequency Modulated CW radar	8

Text/Reference Books:

1. Microwave Engineering, David M. Pozar, Wiley India 3rd Edition
2. Microwave Devices And Circuits, Samuel Liao, PHI
3. Microwave Engineering, Annapurna Das, Sisir K. Das, TMH 2nd Edition
4. Microwave Engineering, Manojit Mitra, Dhanpatrai & Co.
5. Microwave And Radar Engineering, M Kulkarni, Umesh Publishers
6. Microwave Engineering, Sanjeev Gupta Khanna Pub.