

The Maharaja Sayajirao University of Baroda Polytechnic Diploma in Electronics & Communication Engg. (HPP)			ACADEMIC YEAR 2022-23		
Year	II	MICROWAVE ENGINEERING (ELE3434)	Lecture/Tutorial Hrs per week	4/2	
Semester	II		Max marks	100	
Pre-Requisite: Basic Mathematics, Basic Electronics					
CO1	Explain the RF and microwave spectrum, historical development, and key applications.				
CO2	Analyze microwave vacuum tubes including klystrons, magnetrons, TWTs, and BWOs.				
CO3	Evaluate microwave semiconductor devices including Gunn, IMPATT, TRAPATT, tunnel diodes, and microwave transistors.				
CO4	Describe microwave passive components such as couplers, magic tees, hybrids, circulators, and isolators.				
CO5	Measure microwave quantities—VSWR, power, frequency, impedance—and relate key microwave applications.				
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation				
COURSE CONTENT/SYLLABUS					
Unit	Unit Name		Hrs.	Weightage	CO
1	Introduction: RF & Microwave spectrum, Historical Background, Typical application of RF & Microwaves		8	10	CO1
2	Microwave Tubes: Limitation of conventional tubes in microwaves, two cavity and multicavity Klystron, Reflex Klystron, Magnetron, travelling wave tube, Backward wave oscillator – working principles, characteristics.		10	20	CO2
3	Semiconductor Microwave Device: Tunnel diode, Gunn diode, IMPATT diode, TRAPATT diode, Microwave bipolar transistor, heterojunction bipolar transistor, Parametric amplifier		10	20	CO3
4	Passive Components: S- matrix, Directional coupler, Bethe-hole coupler, Magic tee, Hybrid ring, Circulator, Isolator.		8	10	CO4
5	Microwave Measurement: Measurement of VSWR-Low, Medium and High, Measurement of power, Bolometer, Frequency measurement, Impedance measurement.		10	20	CO5
6	Application of Microwaves in satellite communication, Radar, Industrial application of microwaves		10	20	CO5
			56	100	
REFERENCE BOOKS:					
1.	Microwave Devices & Circuits By S.Y.Liao Pearson Education/PHI				
2.	Microwave Engineering By Monojit Mitra, Dhanpath Rai New Delhi				
3.	Microwave Engineering By Kulkarni , Dhanpat Rai New Delhi				