



IV Year-I Semester	L	T	P	C
	0	0	3	2

## MICROWAVE ENGINEERING LAB (RT4104M)

### Prerequisite Course:

Need basic idea of microwave and optical communication subjects

### Course Description and Objectives:

- Understand the working principle of optical sources, detector, fibers and microwave components
- Develop understanding of simple optical communication link.
- Learn about the characteristics and measurements in optical fiber
- Know about the behaviour of microwave components.
- Practice microwave measurement procedure

### Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

COs	Course Outcomes	POs
1	Plot the characteristics of reflex klystron mode and Gunn diode	3
2	Measure the frequency, wavelength & VSWR of microwave components.	3
3	Analyze the working of Horn Antenna, directional couplers, isolator and optical devices	3
4	Measure the scattering parameters of Magic tee, circulator	3

## SYLLABUS

### **Part – A (Any 7 Experiments) :**

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. VSWR Measurement.
5. Impedance and Frequency Measurement.
6. Waveguide parameters measurement.
7. Scattering parameters of Circulator.
8. Scattering parameters of Magic Tee.

### **Part – B (Any 5 Experiments) :**

10. Characterization of LED.
11. Characterization of Laser Diode.
12. Intensity modulation of Laser output through an optical fiber.

13. Measurement of Data rate for Digital Optical link.
14. Measurement of NA.
15. Measurement of losses for Analog Optical link..

**Equipment required for Laboratories:**

1. Regulated Klystron Power Supply
2. VSWR Meter -
3. Micro Ammeter - 0 – 500  $\mu$ A
4. Multi meter
5. CRO
6. GUNN Power Supply, Pin Modulator
7. Reflex Klystron
8. Crystal Diodes
9. Micro wave components (Attenuation)
10. Frequency Meter
11. Slotted line carriage
12. Probe detector
13. wave guide shorts
14. Pyramidal Horn Antennas
15. Directional Coupler
16. E, H, Magic Tees
17. Circulators, Isolator
18. Matched Loads
19. Fiber Optic Analog Trainer based LED
20. Fiber Optic Analog Trainer based laser
21. Fiber Optic Digital Trainer
22. Fiber cables - (Plastic, Glass)