

## MICROWAVE ENGINEERING LABORATORY

**Objective:** Microwave and optical Engineering laboratory provides depth knowledge about the Microwave and Optical components and in analyzing the microwave and Optical equipments. The laboratory exercises are designed to give students ability to design, build, and analyze the components. The first half of the course uses Microwave bench setup. The second half of the course uses Optical setup. A key part of the microwave laboratory experience is to learn how to use microwave test equipment to make measurements of power, frequency, S parameters, SWR, return loss, and insertion loss. Scattering parameters of microwave components are defined and used to characterize devices and system behavior. Passive and active devices commonly utilized in microwave subsystems are analyzed and studied. The students will have an understanding of the concepts involved in transmission and reception of the microwave signals, characteristics of components. Also students will gain in-depth knowledge in the field of Microwave and optical Communication and to apply the concepts learnt through theory and Laboratory in various applications to meet the empathetical needs to our society.



### Sections Handled:

B.Tech IV Year I Semester – Microwave Engineering lab - ECE - A&B Sections

**Major Equipment Details:**

S. No	Name of the Equipment	Quantity
1	2MHZ Function Generator	3
2	Stabilizer 5KV	1
3	DSO 50MHZ	10
4	Optical Power Meter	1
5	Fiber Optic Communication Trainer	3
6	Laser Diode & Fiber Optic Communication Trainer	3
7	Advanced Fiber Optic Communication Trainer	1
8	Fiber Optic Cables-1mm	4
9	Fiber Optic Cables-3mm	4
10	Solid State Klystron Power Supply	5
11	Klystron Mount	5
12	Isolator	6
13	Variable Attenuator	6
14	Slotted Section	6
15	Detector Mount	6
16	SS Tuner	6
17	Tunable Probe	6
18	VSWR Meter	6
19	Gunn Power Supply	10
20	Gunn Oscillator	10
21	Pin Modulator	7
22	Gunn Oscillator	3
23	Pin Modulator	4
24	Fixed Attenuator -3dB, 6 dB, 10dB	4, 5, 5 - No
25	Magic Tee	6
26	Coaxial to W.G.Adaptor	5
27	Y Circulator	6
28	E-Plane, H-Plane Sectorial Horn Antenna	6, 6 - No
29	Pyramidal Horn Antenna	6
30	M/H Directional Coupler-20dB	6
<b>TOTAL COST</b>		<b>Rs.8,95,747.25/-</b>

**Lab Incharge with qualification:** Mrs.VBSS Nagini, M.Tech

**Lab Technician name with qualification:** Mrs.V.Kanaka Durga, DECE

**Experiment list as per curriculum:**

**Part – A:**

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

**Part – B:**

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.

**Experiment list beyond the curriculum**

1. E-Plane Characteristics
2. H-Plane Characteristics