

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

OPTICAL AND MICROWAVE LAB

Equipments Available in the Lab

Sl.No	Hardware	Specification	Quantity
1.	Klystron base test bench		3
2.	Gunn base test bench		3
3.	Horn antenna		2
4.	Magic TEE		3
5.	E-Plane TEE		2
6.	H-Plane TEE		2
7.	Directional coupler		2
8.	Power meter		2
9.	Radiation table		1
10.	Advanced fiber optic trainer Kit		3
11.	Single mode observation kit		1
12.	Link E Laser diode and glass fiber based fiber optic trainer kit		2
13.	850nm LED & detection module		1
14.	LED optical source		4
15.	Optical power meter		4
16.	Connectorization cum splicing tool kit		1
17.	CRO		6
18.	Function generator		2
19.	DSO		2

COURSES OFFERED

Sl.No	Odd Sem (Course code & Name)	Class	Even Sem (Course code & Name)	Class
1	EC 8761 - Advanced Communication Systems Lab	IV ECE	-	

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EC 8761 - ADVANCED COMMUNICATION SYSTEMS LAB

OBJECTIVES:

- Understand the working principle of optical sources, detector, fibers
- Develop understanding of simple optical communication link
- Understand the measurement of BER, Pulse broadening
- Understand and capture an experimental approach to digital wireless communication
- Understand actual communication waveforms that will be sent and received across wireless channel

OUTCOMES:

On completion of this lab course, the student would be able to

- Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber
- Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
- Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
- Understand the intricacies in Microwave System design

LIST OF EXPERIMENTS

Optical Experiments:

1. Measurement of connector, bending and fiber attenuation losses.
2. Numerical Aperture and Mode Characteristics of Fibers.
3. DC Characteristics of LED and PIN Photo diode.
4. Fiber optic Analog and Digital Link Characterization - frequency response(analog), eye diagram and BER (digital)

Wireless Communication Experiments:

1. Wireless Channel Simulation including fading and Doppler effects
2. Simulation of Channel Estimation, Synchronization & Equalization techniques
3. Analysing Impact of Pulse Shaping and Matched Filtering using Software Defined Radios
4. OFDM signal transmission and reception using software defined radios

Microwave Experiments:

1. VSWR and Impedance Measurement and Impedance Matching
2. Characterization of Directional Couplers, Isolators, Circulators
3. Gunn Diode Characteristics
4. Microwave IC – Filter Characteristics