LABORATORY HANDOUT

MICROWAVE LAB (ECE-513)

ECE-5th SEMESTER

ACADEMIC YEAR (2024-25)

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
ECE-513	Microwave Lab	PCC	2	0	0	4	50	-	50

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Plot and understand the impact of change in reflector voltage on current and frequency in reflex klystron tube.
CO2	Evaluate the parameters (frequency, wavelength) of rectangular waveguide for a particular mode.
CO3	Calculate reflection coefficient and VSWR of electromagnetic field.
CO4	Verify the impedance measured using klystron tube with Smith Chart.
CO5	Determine attenuation using isolator and circulator

LIST OF EXPERIMENTS

S.No.	Title
1	Verify the characteristics of Reflex Klystron tube and to determine its electronic tuning range.
2	Determine the frequency and wavelength in Rectangular waveguide.
3	Determine the standing-wave ratio & reflection coefficient.
4	Measure unknown impedance with smith chart.
5	Verify the characteristics of Gunn diode.
6	Verify V-I Characteristics.
7	Determine output power & frequency as a function of voltage.
8	Calculate the coupling factor & directivity using a directional coupler.
9	To study the following Tees: - E-Plane H-Plane Magic Tee
10	To study the Isolator & Circulators.
11	Examine and Demonstrate the radiation pattern of Horn antenna.

ADDITIONAL WEB RESOURCES

1.	VLAB LINK: Microwave lab by IIT Delhi which gives hands-on experience to the students. eem-iitd.vlabs.ac.in/experiments.htm

LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.

- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.
- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.
- Software/Simulation Tools:
- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.
- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.
- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.
- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT

- **Continuous Evaluation**: 30 marks
- **Final Demo & Viva**: 10 marks
- **Attendance**: 10 marks
- **Lab Overall Marks**: 50 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions**: Manuals and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
  Monday (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  satyendra.ece@mietjammu.in

RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			
	Low	**Medium**	**High**	**Marks**
Execution of the Experiment	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Record	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Viva Voice	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	0-2 Marks	**3-6 Marks**	**7-10 Marks**	
Total Marks				**30**