Birla Institute of Technology & Science, Pilani
Hyderabad Campus

BITS-Pilani, Hyderabad Campus
SECOND SEMESTER 2022-2023

Course Handout

Date:
16/01/2023

In addition to Part I (General Handout for all courses appended to the Timetable) this portion gives further specific details regarding the course.

Course Number	**: ECE F312**	**0 1 0**
Course Title	**: Electromagnetic Fields and Microwave Engineering Laboratory**	
Instructor-in-Charge	**: Prof. RUNA KUMARI.**	

Scope and Objective of the Course: Microwave components and systems have made a great impact on our society with the rapid proliferation of various consumer products. The focus of the Microwave Laboratory will be the development and use for scientific studies of the microwave frequencies. It makes the student aware of basic concept of the Microwave Test-Bench. Experiments based on microwave sources, VSWR measurement, impedance measurement, various microwave components will be carried out in this lab. This lab will also motivate the students to work towards the design and analysis of microwave circuits, filters, couplers and microstrip antennas for microwave wave applications using design software.

Textbooks :

1. Lab Manual on Electromagnetic Fields and Microwave Engineering Laboratory
2. Basic microwave techniques and laboratory manual by M.L. Sisodia
3. Manual of Ansys HFSS and CST

Course Plan:

The laboratory classes will be conducted in the Microwave Engineering laboratory. The practical are intended to provide hands-on experience on the concepts learnt in the Electromagnetic Fields and Microwave Engineering course. Details of the experiments will be available in the “Laboratory Manual”. Laboratory marks mentioned includes marks for record and attendance in lab practical.

List of Experiments

1. **Familiarization with Microwave Lab Components/Equipment**
2. **Study of Gunn Diode Characteristics and characterization of Reflex Klystron**
3. **Determination of VSWR and Reflection Coefficient**
4. **Measurement of dielectric constant of a given material (Solid, Liquid)**

5. **Impedance measurement and determination of frequency of a source using waveguide**
6. **Design of Microstrip antenna using CST**
7. **Design of Dielectric Resonator Antenna using CST**
8. **Design of Microwave components-II : E/H/Magic Tee using CST**
9. **Design of Waveguide Filter using CST**
10. **Design of SIW Bandpass Filter using HFSS**
11. **Design of Directional Coupler using HFSS**
12. **Design of Power divider using HFSS**

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Laboratory Practical Regular class work	2 hours/ week	30%	Regular lab Performance	Open Book
Midsem Lab Quiz		20%	Will be announced	Closed Book
Project		20%	End semester Project presentation (TBA)	Open Book
Lab Exam		30%	Will be announced	Closed Book

Chamber Consultation Hour: Chamber consultation hours of Instructors will be announced separately.

Notices: All notices of this course will be displayed in CMS

Make-up Policy: Only One Lab Make-up will be granted for genuine reason with prior-permission from Instructor-in-charge.

Academic Honesty and Integrity Policy:
Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Runa Kumari
Instructor-in-Charge
ECE F312