



**FIRST SEMESTER 2019-20**

Course Handout Part II

01/08/2019

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

<i>Course No.</i>	: ECE F312
<i>Course Title</i>	: Electromagnetic Fields and Microwave Engineering Laboratory
<i>Instructor-in-Charge</i>	: Sourav Nandi
<i>Instructors</i>	:

**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. Ansys HFSS Manual
4. CST Manual

**Course Plan:**

The laboratory classes will be conducted in the Microwave Engineering laboratory. The practical experiments 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. **Design of microstrip transmission line (HFSS/ADS)**
3. **Characterization of Reflex Klystron**
4. **Determination of frequency of a source using waveguide**
5. **Single stub matching technique (ADS)**



6. Double stub matching technique (ADS)
7. Study of Directional Coupler
8. Study of Magic Tee
9. Design of Power Divider using Ansys HFSS/CST
10. Design of Rectangular Waveguide using Ansys HFSS/CST
11. Design of Rat race coupler using Ansys HFSS/CST
12. Design of Microstrip antenna using Ansys HFSS/CST

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Laboratory Practical Regular class work	2 hours/ week	45%	Regular lab Performance	Open Book
Midsem Lab Quiz	30 mins	25%	Will be announced	Closed Book
Lab Exam	90 mins	30%	Will be announced	Closed Book

**Chamber Consultation Hour:** To be announced in lab  
email: [sourav@hyderabad.bits-pilani.ac.in](mailto:sourav@hyderabad.bits-pilani.ac.in)

**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. Makeup for Midsem Test and Comprehensive Examination will be given only in **extremely genuine cases** for which prior permission of the instructor-in-charge is required.

**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.

**Sourav Nandi**  
**INSTRUCTOR-IN-CHARGE**  
**ECE F312**

