



MICROWAVE ENGINEERING

PROF. RATNAJIT BHATTACHARJEE

Department of Electrical Engineering
IIT Guwahati

COURSE OUTLINE :

This course intends to provide a foundation for microwave engineering to the undergraduate students. Rigorous treatment of the fundamentals of microwave engineering will be provided. Design of different passive and some active microwave circuits/subsystems will be covered in detail. This course will also provide an overview of application of microwave in communication and other areas.

ABOUT INSTRUCTOR :

Prof. Ratnajit Bhattacharjee received his B.E. in Electronics and Telecommunication Engineering (First Class Hons) from REC-Silchar, Gauhati University, M.Tech. (E and ECE Department, Microwave Engineering specialization) from IIT Kharagpur and Ph.D. (Engineering) from Jadavpur University, Kolkata. Presently, he is a Professor in the Department of Electronics and Electrical Engineering, IIT Guwahati. Prior to joining IIT Guwahati in 2002, he was a faculty member in REC (NIT) Silchar. His research interest includes Wireless communication, Wireless networks, Microstrip antennas, Microwave Engineering and Electromagnetics. Eleven research students have completed their PhD under his supervision and at present several students are working under his guidance. He has co-authored about one hundred and forty research papers in journals, international and national conferences. He has served as General Chair for 5th edition of IEEE Applied Electromagnetic Conference, AEMC 2015 and 22nd National Conference on Communications, NCC 2016, Chairman for the NPSC 2014 and Convener for IESC 2017. He has developed a web course on Electromagnetic Theory under the NPTEL project of MHRD, India and also involved with the on-going mission project on Virtual Labs as coordinator of EE discipline laboratories and Institute coordinator for IIT Guwahati. He has been involved with some research projects. Currently, he is Chief Coordinator for a Ministry of Electronics and Information Technology (MeitY) India sponsored project for setting up of an Electronics & ICT academy at IIT Guwahati. He is a member of IEEE and life member of Indian Society of Technical Education.

COURSE PLAN :

Week 1: Introduction to Microwave Engineering and Transmission line theory

Week 2: Rectangular and Circular waveguides

Week 3: Microwave Networks and Scattering Matrix

Week 4: Impedance Matching

Week 5: Microwave Resonators

Week 6: Power divider, directional couplers and filters

Week 7: Microwave Semiconductor Devices

Week 8: Microwave Amplifiers and Oscillators

Week 9: Microwave Tubes

Week 10: Ferrite devices

Week 11: Introduction to Microwave Integrated Circuits (MIC)

Week 12: Microwave Communication Systems and other application areas