MICROWAVE ENGINEERING

PROF. RATNAJIT BHATTACHARJEE
Department of Electrical Engineering
IIT Guwahati

TYPE OF COURSE: Renun | Core | UG
COURSE DURATION: 12 weeks (20 Jul’20 - 09 Oct’20)
EXAM DATE: 18 Oct 2020

PRE-REQUISITES: Basic course of Electromagnetic Theory
INTENDED AUDIENCE: B. Tech/BE (Third/Fourth year ECE) students
INDUSTRIES APPLICABLE TO: DRDO, ISRO, BEL, SAMEER and other companies working in the area of RF and Microwave

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 from Guwahati University, M.Tech in Microwave Engineering from IIT Kharagpur and Ph.D from Jadavpur University, Kolkata. Presently, he is a Professor in the Department of Electronics and Electrical Engineering, IIT Guwahati. His research interest includes Wireless communication, Wireless networks, Microstrip antennas, Microwave Engineering and Electromagnetics. Eleven research students have completed their PhD under his supervision. He has co-authored about one hundred and forty research papers and has developed a web course on Electromagnetic Theory under the NPTEL project. He is also involved with the on-going mission project on Virtual Labs as coordinator of EE discipline laboratories and Institute coordinator for IIT Guwahati.

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