MICROWAVE ENGINEERING

PROF. RATNAJIT BHATTACHARJEE
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IIT Guwahati

COURSE OUTLINE :

This course indends 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 joined IIT Guwahati in the year 2002 and currently is a Professor in the Department of Electronics and Electrical Engineering. His research interests include Wireless communication, Wireless networks, Microstrip antennas, Microwave Engineering and Electromagnetics. He has co-authored about one hundred and seventy-five research papers. Twenty-one research students have completed their PhD under his supervision. H has served as General Chair for 5th edition of IEEE Applied Electromagnetic Conference, AEMC 2015 and 22nd National Conference on Communications, NCC 2016. He has served as Head, Electronics and Electrical Engineering, IIT Guwahati, from 2011 to 2014. He has delivered invited talks in a number of conferences, symposia and workshops. He has developed a web course on Electromagnetic theory and a video course on Microwave Engineering under NPTEL. He has also been involved with several research projects. He has served as the chief investigator for the MeitY sponsored project for setting up of an Electronics & ICT academy at IIT Guwahati. He is a member of the research advisory committee of SAMEER and lab research council of LRDE. He is presently Head for the Mehta Family School of Data Science and Artificial Intelligence, IIT Guwahati and also Head of the Computer and Communication Centre, IIT Guwahati. Prior to joining IIT Guwahati, he served as a faculty member at REC (at present NIT) Silchar from 1991 to 2002.

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