Approval: 6th Senate Meeting

Course Name : Microwave engineering
Course No. : EE 616
Credits : 2-0-0-2
Prerequisite : Basic Course in Electromagnetics/ Engineering Electromagnetics
Students Intended for : Senior B.Tech, Mtech, PhD students of Electrical Engineering
Elective or Compulsory : Elective
Semester : Odd/Even

Course Outline:
Microwave Circuits/Engineering

Transmission Line Theory and network analysis

Electromagnetic analysis and transmission line theory of coaxial lines and waveguides, metamaterial lines, Impedance matching in microwave circuits, Microwave network analysis, N-port microwave network , Scattering matrix, Properties of the scattering matrix , S-parameters at arbitrary planes, S parameter measurements. [05 hrs]

Power Dividers and Directional Couplers

Basic Properties of power dividers and couplers, T junction, Wilkinson type, quadrature hybrid power dividers, coupled line directional coupler,180 deg. Hybrid coupler. [04 hrs]

Microwave Filters

Basic Filter design techniques like image parameter and insertion loss, Filter transformations and implementations, low pass filters, coupled line filters, coupled resonator based filters, metamaterial filters**.** **[**04 hrs]

Ferrite devices

Circulators, isolators, phase shifters. [04 hrs]

Active Microwave components

RF Diode, Microwave Transistors, Microwave ICs. [04 hrs]

Microwave sources and Amplifiers

Tube type sources like magnetrons, klystrons, Single stage Transistor amplifier, Stability circles, Broad band amplifier design, Solid state Power amplifiers. [04 hrs]

Oscillators and Mixers

Microwave oscillators using Transistors, dielectric resonators, diode and transistor based mixers.

[03 hrs]

Textbook book:

1. Microwave Engineering by David. M. Pozar, Wiley

Reference book:

2. Foundations for Microwave Engineering by R.E. Collins –IEEE Press