*7th Semester*

## PEI7J001    MICROWAVE AND ANTENNA ENGINEERING (3-1-0)

**University Level(80%)**

**MODULE I (14 Hrs)**

Transmission lines: The lumped element circuit model for a transmission line, wave propagation, field analysis of two wire and coaxial transmission lines, characteristic impedance, terminated transmission line, reflection coefficient, voltage standing wave ratio, scattering matrix, signal flow graph, Smith chart, transmission line problem solutions with Smith chart, single stub and double stub matching
Rectangular and cylindrical waveguide: wave propagation, modes in waveguides, power flow , attenuation due to conductor and dielectric losses

**MODULE II (12 Hrs)**

Microwave Devices and components
Reflex klystron: velocity modulation, electronic admittance, output power and frequency
Magnetron: Principle of operation, rotating field, π mode of operation, frequency of oscillation, the ordinary (O-type) TWT-principle of operation as an amplifier

**MODULE III (12 Hrs)**

Antenna and parameters: Radiation pattern, beam solid angle, directivity, gain, input impedance, polarization, bandwidth, reciprocity, equivalence of radiation and receive patterns, equivalence of impedances, effective aperture, vector effective length, short dipole, radiation resistance and directivity, half-wave dipole, monopole, small loop antenna

**TEXT BOOKS:**

1. David M.Pozar, " Microwave Engineering", Wiley, 4thEdn., 2013
2. A.R. Harish and M.Sachidananda, " Antennas and Wave Propagation", Oxford University Press 2007

**REFERENCE BOOK:**

1. S  shrut Das, " Microwave Engineering", Oxford University Press 2014