SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Physics)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PS03EPHY03	**Total Credit: 4**
Title Of Paper: Microwave Communication, Electronics & Technology	

Unit	Description in detail	Weightage (%)
I	Microwave tubes: Klystrons- Reflex Klystrons. Performance characteristics and applications Cavity magnetron, Travelling Wave Tube (TWT), Microwave Transistors: Constructional features of BJT and MESFET, Varactor diode, PIN diode, Schottky diode, Negative Resistance Microwave Devices- Tunnel diode, Gunn diode and Impatt diodes.	25%
II	Fundamentals of Transmission lines- parallel wire, co-axial cable, equivalent circuits, Characteristics impedance, Primary line constants, Phase velocity, Voltage Standing Wave Ratio (VSWR), Idea about ridged structure. Design aspects of waveguides- rectangular and circular, Choice of the type of wave guide, Waveguide dimensions. Methods of exciting waveguides, Waveguide joins- cylindrical and rectangular, Magic- tee, Applications of magic- tee, Attenuators, Flanges.	25%
III	Wave-Propagation in free space, Propagation characteristics, Ground waves, Space waves, Idea about tropospheric propagation and its range, Ionospheric layers, Ionospheric propagation and its range, Radio horizon, Critical frequency, critical angle, Maximum usable frequency, Virtual height, Fading, multiple hope transmission, satellite communication.	25%
IV	Antennas- Classification of antennas, Radiation fields and antenna patterns, effective area of antenna, effective length of antenna, Vertical antennas, Folded antennas, construction and working of Loop antennas, Ferrite rode antennas, structure and operation of Driven arrays. VHF, UHF and Microwave antenna- structure and working of Horn antenna, Parabolic and Helical antenna, structure of Dish Antenna, radiation mechanism in dish antenna, operation of dish antenna.	25%

Basic Text & Reference Books:-

- Electronic Communication
  D. Roody and J. Coolen Prentice Hall.
- Electronic Communication Systems
  G. Kennedy, Mc-Graw Hill.
- Electronic Communication Systems
  F. R. Dungan, Delmar Publishers Inc.
- Microwave Principles
  H. J. Reich, J. G. Skalnik, P. F. Ordung and H. L. Krauss, East-West Press
- Modern Microwave Technology
  V. F. Velley, Prentice Hall.
- Electronic Devices and Components
  J. Seymore, Longman Scientific and Technical Publication.