Sankalchand Patel University

Faculty of Science & Humanities

Master of Science (Physics) (Sem-3)

In Effect from Academic Year 2022-23

Subject Code:1SC2050305	**Subject Title: Microwave Communication: Electronic and Technology**

COURSE OBJECTIVE:

Physics is a science to understand the nature. This course is designed to get basic understanding of the physical world.

LEARNING OUTCOMES:

- To get basic concepts of Microwave communication: Electronic and Technology

Teaching scheme (hours) per week		**Credit**		**University Examination**		**Internal Examination**		**Total**
Theory	**Practical**	**Theory**	**Practical**	**University Assessment**	**Practical**	**Internal Assessment**	**Practical**	
4	**--**	**4**	**--**	**60**	**--**	**40**	**--**	**100**

Unit	**Content**	**Lectures**	**Weight (%)**
1	Transmission Lines and Wave Guides: Fundamentals of Transmission lines- parallel wire, co-axial cable, equivalent circuits Characteristics impedance, Primary line constants, Phase velocity, Voltage Standing Wave Ratio(VSWR) 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.	15	25
2	Microwave tubes: Klystrons- Reflex Klystrons. Performance characteristics and applications Cavity magnetron, Travelling Wave Tube (TWT),Microwave Transistors: Constructional features of BJT and MOSFET, Varactor diode, PIN diode, Schottky diode, Negative Resistance Microwave Devices- Tunnel diode, Gunn diode and Impatt diodes.	15	25
3	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.	15	25
4	Antennas- Classification of antennas, Radiation fields and antenna patterns, 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 antenna, Structure of Dish Antenna, radiation mechanism in dish antenna, operation of dish antenna.	15	25

Basic Reference book:

1. Electronic Communication D. Roody and J. Coolen Prentice Hall.
2. Electronic Communication Systems G. Kennedy, Mc-Graw Hill.
3. Electronic Communication SystemsF. R. Dungan, Delmar Publishers Inc.
4. Microwave PrinciplesH. J. Reich, J. G. Skalnik, P. F. Ordung and H. L. Krauss,
5. East-West Press Modern Microwave TechnologyV. F. Velley, Prentice Hall.
6. Handbook of Electronics: Gupta and kumar