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SPPU

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Includes

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FOR
SEMESTER – I

**FINAL YEAR (B.E.) DEGREE COURSE IN
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
(Also Useful for Electronics Engineering)**

**Strictly According to New Revised Credit System Syllabus
of Savitribai Phule Pune University
(w.e.f. June 2018)**

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SYLLABUS

Unit I : Fundamental Theory of Radiation and Radiating Elements

8 Hrs

Fundamental equations for free space propagation, Friis transmission equation, Definition of antenna, radiation mechanism and types of antenna, performance parameters such as radiation pattern, directivity, gain, efficiency, half power beam width, bandwidth, polarization, input impedance, radiation efficiency, effective length, effective area, radiation sphere.

Unit II : Radiating Elements and Arrays

7 Hrs

Comparison of various radiating elements such as infinitesimal dipole, small dipole, finite length dipole and half wave length dipole, analytical treatment of these elements. Planar, log periodic and YagiUda antenna. Types of arrays, two element array, N-element array, uniform amplitude uniformly spaced linear broad side and end-fire array.

Unit III : Transmission Lines and Waveguides

6 Hrs

General solution for TEM, TE and TM waves. Analysis of coaxial line and rectangular waveguides. Analysis of rectangular cavity resonators and their applications, Striplines: Structural details, types and applications.

Unit IV : Passive Microwave Components

6 Hrs

Construction, working principle and scattering analysis of passive microwave components such as E-plane, H-plane and magic tee. Ferrite composition, characteristics and Faraday rotation principle. Construction, working principle and scattering analysis of isolator, circulator and directional coupler. Construction and operation of gyrator.

Unit V : Active Microwave Components

6 Hrs

Limitations of conventional tubes, O and M type classification of microwave tubes, re-entrant cavity, velocity modulation. Construction, operation, performance analysis and applications of -Single cavity and two cavity klystron, Cylindrical wave magnetron and Helix traveling wave. Construction, working principle and applications of two terminal microwave devices such as tunnel diode, Gunn Diode, PIN Diode, Schottky Barrier Diode and Varactor.

Unit VI : Microwave Systems and Microwave Measurement Techniques

6 Hrs

Microwave terrestrial and satellite communication system and industrial applications of microwaves such as microwave heating, thickness and moisture measurement, medical application such as microwave diathermy. Microwave measurement devices such as slotted line, tunable detector, VSWR meter, power meter, and their working principles. Microwave measurement techniques to measure S-parameters, frequency, power, attenuation, phase shift, VSWR, impedance. Radiation hazards and protection.



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