UNIT-I: MICROWAVE GENERATORS:
Transit time effect at high frequency, Failure of triodes/diodes at high frequency, Concept of velocity modulation and current modulation, Klystron operation and characteristics, Reflex klystron, Magnetron, Principle of operation of microwave characteristics, Traveling wave tube.

UNIT-II: MICROWAVE SOLID STATE DEVICES:
Microwave transistors, Microwave field effect transistors, Tunnel diode, Concept of transferred electron devices, Gun diode, Impact avalanche transit time, IMPATT Diode, BARRITT diode.

UNIT-III: TRANSMISSION LINES:
Transmission line equation and solution, Reflection and transmission coefficient, Standing wave ratio, Line impedances, Smith chart, Propagation of EM waves in rectangular waveguide, Solution of wave equation and dispersion in rectangular waveguide, Guide and cut off wavelength, TE and TM and tm modes in rectangular waveguide.

UNIT-IV: MICROWAVE PROPAGATION AND COMPONENTS:
Wave propagation in circular waveguide, Solution of wave equation in cylindrical coordinates, TE and TM modes in circular wave guides, TEM modes in circular wave power transmission and losses in circular wave guide, Cavity resonators, Wave guide Tee (magic tee).

UNIT-V: MICROWAVE INTEGRATED CIRCUIT:
Characteristic impedance of micro strip lines, Effective dielectric constant, Losses in micro strip lines, Dielectric losses, Ohmic losses, Radiation losses, Quality factor Q of transmission lines, Micro strip lines discontinuities, Idea of capacitance and inductors, Idea of materials used for integrated circuit, Brief idea about microwave integrated circuits.

BOOKS RECOMMENDED:

1. Fundamentals of radio engineering  F.E. Terman
2. Microwaves                      Atwater
3. Fundamentals of microwave       Rich
4. Field theory of guided wave     Plonsey & collin
5. Microwaves                      Lio
UNIT-I: OPTICAL FIBRES:
Optical fiber modes and configuration, Fiber types, Ray optics representation, Mode theory for circular wave guide, Wave guide equation, Wave equation for step index fibers, Modal equation, Modes in step index fibers, Power in step index fibers, Modes in graded index fibers.

UNIT-II: SIGNAL DEGRADATION IN OPTICAL FIBRES:
Fiber material fabrication, Attenuation units, absorption, scattering losses, Radiative losses, Core and cladding losses, Signal distortion in optical wave guide, Information capacity determination, Group delay, Material dispersion, Waveguide dispersion, Intermodal dispersion.

UNIT-III: OPTICAL SOURCES:

UNIT-IV: PHOTO DETECTORS:
Radiative and non radiative transition, Optical absorption, Bulk and thin films photoconductive devices (L D R ), Solar cell (Open circuit voltage and short circuit current, fill factor), Pin photo detectors, Avalanche photo diodes, Photo detector, noise sources, Detector response time (depletion layer photo current), Response time, Avalanche multiplication noise, Temperature effect in avalanche gain, Photodiode materials.

UNIT-V: OPTICAL RECEIVER OPERATION:

BOOKS RECOMMENDED:
1. Optical fibres G.Keiser
2. Opto electronics Ghatak
UNIT-I: SEMICONDUCTOR MEMORIES:
External organization of memories, Memory organization, memory system organization,
Timing characteristics of memories, Basic operation, Timing relations and parameters,
Idea of RAM and ROM memory.

UNIT-II: COMPUTER ARCHITECTURE:
Organization of microcomputer (8085/8088). General-purpose resistors and register
pairs. General processing unit of a microprocessor, Timing and control unit. Fetch and
execute cycle. Addressing techniques: direct, immediate, relative indirect and indexed
addressing, Single address computer organization.

UNIT-III: COMPUTER ARCHITECTURE II:
General discussion about input / output of microprocessor, Simple I/O sections, General
I/O sections, Useful I/O facilities and their control, Concept of interfacing, Types of
interfacing devices, Concept of flags and their uses, Interrupt facility, Advantages and
disadvantages of interrupts, Simple interrupt systems, Direct memory Access (DMA.)

UNIT-IV: ASSEMBLY LANGUAGE PROGRAMMING:
Concept of assembly language and assemble. The instruction set of 8085/8088, Op-codes,
mnemonics, Machine cycle and instruction cycle. Debouncers, Clock buffers, The
presettable counter, The memory reference instructions, Loops, Jump instructions.
Addressing modes, Stack, Call, Return instructions and Their routines.

UNIT-V: APPLICATIONS OF MICROPROCESSORS:
Introduction, Temperature monitoring system, System requirements, Over all system
design, Hardware / software design, Closed loop control, Process of growing synthetic
quartz, Date acquisition system, I/O device control, Development of interface for CRT,
Printer and keyboards.

BOOKS RECOMMENDED:
1. Digital computer principles: A.P. Malvin and Leach.
2. Digital computer electronics and microprocessors: A.P. Malvin
3. Introduction to microprocessors: A.P. Mathur
5. Introduction microprocessors: L.A. Leventhal
UNIT-I: SIGNAL ANALYSIS
Fourier analysis of signals: Amplitude, Phase and power spectrum, Auto correlation and cross correlation and their Fourier transforms, Signal transmission through linear time invariant (LTI) system, Impulse response frequency response, Group delay, Phase delay

UNIT-II: MODULATION AND DEMODULATION
Basic principles of amplitude, Frequency and phase modulation and demodulation. Spectral analysis of these operations, Elements of hardware, Realization of analog communication systems, AM, FM transmitters, Concept of intermediate frequency and principle of super heterodyne receivers, Tuning ranges, Tracking, Sensitivity & gain, Image Rejection, Adjacent channel selectivity, AGC (Automatic Gain Control), ETR (Electronically Tuned receivers)

UNIT-III: DIGITAL COMMUNICATION

UNIT-IV: NOISE:

UNIT-V: RADAR COMMUNICATION:

1. Symen Haykins: Communication Systems
2. Taub & Shilling: Principle & Communication Systems
3. D. Roddy & J. Coole: Electronic communication
4. G.K. Mithal: Radio Engineering
5. Singh & Sare: Communication System