Syllabi of the courses in the Curriculum:

Electronics Engg.

Periods / week – 03		Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100		Total marks – 125	Duration of exam – 3 hrs
WLE-101:	**CIRCUIT THEORY**		

I INTRODUCTION

Definition of various electrical quantities: such as charge, current, voltage, resistance, power, work, energy, potential and potential difference, their units and relationship with each other. Basic circuit, SI units. The three basic parameters of electric circuit theory: resistance, capacitance and inductance, current-voltage relation and properties of each. Ohm's law, simple circuits: series, parallel and series-parallel connection of resistors, capacitors and inductors (simple problems).

II NETWORK: LAWS & THEOREMS

Kirchoff's voltage and current laws (problems). Maxwell theorem, superposition theorem. Thevenin's theorem, Norton's theorem, Maximum power transfer theorem.

III ELECTROMAGNETISM AND MAGNETIC CIRCUITS

Basic of electromagnetism, Faraday's law of electromagnetic induction, Lenz's law, Fleming's right hand rule, magneto motive force, magnetic field intensity. Permeability, relative permeability, reluctance, magnetic circuit, series magnetic circuit, series-parallel magnetic circuit. Hysteresis, Magnetic circuit losses.

IV A.C. CIRCUIT

Definition and explanation of alternating current, voltage and their relative terms, phasor diagrams of alternating current and voltage. Series A.C. circuits, parallel a.c. circuits containing purely resistive, capacitive, inductive elements, a combination of two elements and a combination of all three elements.

V RESONANT AND COUPLER CIRCUITS

Series resonance (definition, derivation of expressions for resonant frequency, impedance quality factor, voltage and current, resonance curve, lower and upper half power frequency bandwidth and selectivity, dependence of bandwidth and selectivity on quality factor(problems based on the above). Parallel resonance (same as for series resonance). Inductively coupled circuits: mutual inductance and coefficient of coupling. Analysis of inductively coupled circuits.
Transformer as Inductively Coupled Circuit: (i) With untuned primary and untuned secondary (ii) Untuned primary and tuned secondary (iii)Tuned primary and tuned secondary (problems based on these).

BOOKS RECOMMENDED

1. *Electrical Technology, by B.L. Thereja*
2. *Fundamentals of Electrical Engg., by Ashfaq Husain*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-102:	**ELECTRONIC DEVICES & CIRCUITS**	

I SEMI CONDUCTOR PHYSICS AND DIODES

Atomic structure and elementary concept of energy bands, conduction in crystal at absolute zero temperature and above in intrinsic semi-conductor. Doping and extrinsic semi-conductor. P-type and N-type semi-conductor. PN junctions, depletion layer, barrier potential, width and height of barrier, junction biasing, characteristics and break down (Avalanche's and Zener effect). Characteristics, operation of LED, photo diode, varacter diode, schottky diode, tunnel diode, Zener diode and its applications as a voltage regulator.

II RECTIFIERS & FILTER CIRCUITS

Concept of rectification, specification of a rectifier diode. Single phase, half wave, full wave, bridge rectifier circuits and their operation. Calculations of ripple factor and rectification efficiency of rectifiers. Concept of filtering and filtering circuits. Working and use of voltage-doubler circuits.

III BIPOLAR JUNCTION TRANSISTOR

Concepts of transistors, type: NPN-PNP, their construction and operations. Transistor amplifying action. Transistor configuration common base, common Emitter and common collector, idea of their current gain, voltage gain, input characteristics and output characteristics.

IV FIELD EFFECT TRANSISTOR

Introduction, merits of FET over BJT. Type of FET. Construction and characteristics of JFETS. Introduction to MOSFETS. Depletion-type and Enhancement type MOSFETS, their construction and characteristics. Introduction to VMOS and CMOS.

V TRANSISTOR BIASING

BJT Biasing: Introduction, operating point, fixed bias circuit and voltage divider bias stabilization derivation of stability factor's for various biasing circuits.
FET Biasing: Introduction, fixed bias configuration, self-bias configuration and voltage divider biasing.

BOOKS RECOMMENDED:

1. *Electronic Devices & Circuits, by Bogart*
2. *Basic Electronics & Linear Circuits, by N.N. Bhargava*
3. *Principles of Electronics, by V.K. Mehta.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-103:	**DIGITAL SYSTEM-I**	

I NUMBER SYSTEMS & CODES

Review of decimal number, binary number system. Conversion of binary to decimal & vice-versa. Signed numbers, 1's and 2's complements of binary numbers. Binary Arithmetic: Addition, subtraction, 1's complement subtraction, 2's complement subtraction, Multiplication, Division. Octal and Hexadecimal numbers and their conversion to binary numbers and vice versa. Binary coded Decimal (B C D), 8421 Code. Digital codes: the Grey Code and the Excess-3 Code & their conversion to Binary & vice versa. Alpha numeric Codes - ASCII code.

II BOOLEAN ALGEBRA AND LOGIC GATES

NOT (Inverter) , AND, OR, NAND and NOR Gates - Definition, Symbol, Truth table and pulsed operations. EXOR and EXNOR gates. Logic Gate applications. Boolean addition & Subtraction. Logic Expressions. Rules & Laws of Boolean Algebra. Demorgan's Theorems. Boolean Expressions for Gate Network - SUM of PRODUCT Form & PRODUCT of SUM form. Simplification of Boolean Expressions . The Karnaugh Map (upto 4-variables).

III COMBINATIONAL LOGIC

Analysis of Combinational Logic Circuit: AND-OR logic, AND-OR - Invert Logic, Exclusive - OR logic and a General Combinational Logic Circuit. Designing combinational logic circuits. Gate minimization - use of Karnaugh Map. Universal Property of NAND gate and NOR Gate, NAND and NOR implementation.

IV DIGITAL SYSTEMS

Half Adder and Full Adder & their realization using combination of AND, OR, Exclusive - OR and NAND gates. Half and full subtractors. Magnitude comparators. Decoders and Encoders. Multiplexers and Demultiplexures. Parity Generators/Checkers.

V SEQUENTIAL LOGIC CIRCUITS

Introduction, difference between combinational logic circuit and sequential logic circuit.
FLIP FLOPS: RS, clocked RS,D, JK and T flip flops. Triggering of flip flops.

BOOKS RECOMMENDED:

1. *Digital Fundamentals, by Thomas L. Floyd UBS*
2. *Digital Logic & Computer Design, by M. Morris MANO*
3. *Digital Computer Fundamentals, by BARTEE T.*

Periods / week – 03		Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100		Total marks – 125	Duration of exam – 3 hrs
WLE-201:	**ELECTRICAL ENGG.**		

I D.C. MACHINE (GENERATOR AND MOTOR)

Basic principle of generator. Constructional details of D.C. generator. Derivations of e.m.f. equations, simple problems. Losses, efficiency of DC generator, armature reaction, commutation. Working principle of D.C. motors. Back or Counter e.m.f. Significance of back emf, Starting and speed control of D.C. motors.

II TRANSFORMER

Working principle, constructional features, types of transformer. E.M.F. equation of transformer (simple problems). Losses. Theory of an ideal transformer, transformer on no-load, transformer on on-load. Actual transformer, transfer of transformer winding parameters, voltage regulation of transformer (simple problems). Phasor diagram and equivalent circuit of transformer. Testing of transformer. Auto transformer.

III INDUCTION MACHINES

Constructional features of single phase induction motor. Methods for the self start of single phase induction motor. Split phase, shaded pole motors and their applications. Working construction of three phase induction motor. Concept of rotating magnetic field.

IV SYNCHRONOUS MACHINES AND STEPPER MOTOR

Constructional features of A.C. synchronous motors. Methods of starting of synchronous motor. Constructional features and principle of operation of an alternator. Introduction to stepper motors (Constructional features and method of operation stepper motor).

V POWER ELECTRONICS

Circuit operation and characteristics of S.C.R., Triac, diac and UJT. Controlled rectification of single phase supply using S.C.R. A.C. phase control circuits in illumination and temperature control etc. D.C. to A.C. inverter.

BOOKS RECOMMENDED

1. *Electrical Machines, by S.K. Bhattacharya, TATA McGraw Hills Pvt. Ltd., TTTI, Chandigarh.*
2. *Electrical Technology, by S.L. Theraja*
3. *Fundamentals of Electrical Engg., by Ashfaq Husain*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-202:	**ANALOG ELECTRONIC CIRCUITS**	

I A.F. VOLTAGE AMPLIFIER

General classification of amplifiers, difference between voltage and power amplifier and requirement of A.F. amplifiers. R.C. coupled amplifier-circuit diagram and operation. Frequency response of R.C. coupled amplifier at low, mid and high frequency. Advantages and disadvantages. Transformer coupled amplifier-circuit diagram, frequency response, advantages and disadvantages.

II A.F. POWER AMPLIFIER

Class A power amplifier with direct coupled resistive load and with transformer coupled resistive load. Class B push pull amplifier-operating condition, characteristics, analysis showing cancellation of harmonic terms. Complementary symmetry-circuit, working and advantages. Darlington pair circuit. Driver-circuit and working.

III TUNED AMPLIFIERS AND WAVE SHAPING CIRCUITS

Problems of R.F. amplification. Generalized single tuned transistor amplifier-coupling method, operation, gain, selectivity and bandwidth. Doubled tuned amplifier-circuit diagram and characteristics. R.F. class C amplifier-circuit operation, efficiency, output power and distortion. Clippers, Clampers.

IV FEED BACK AMPLIFIERS AND OSCILLATORS

Definition of positive feed back and negative feed back in amplifiers. Effect of negative feed back in amplifiers. Types of negative feed back (negative voltage feed back and negative current feed back). Feed back circuit, gain of negative feed back amplifier. Multi-vibrators – Monostable, bistable and astable. Barkhausen's criterion of oscillations. Feed back oscillators. Circuit diagram and working of generalized LC, RC and Wien's bridge oscillator. Principle of working, circuit and characteristics of crystal oscillator.

V OPERATIONAL AMPLIFIER AND THEIR APPLICATIONS

D.C. amplifiers-block diagram and characteristics of an ideal op-amp. Definition of various parameters-voltage gain, amplifier output and input voltage and current, CMRR, slew rate. Techniques of offset removal. Applications of op-amp.-adder, scale changer, subtractor, integrator, differentiator, comparator, zero crossing detector and Schmitt trigger. Active filters-low pass, high pass.

BOOKS RECOMMENDED

1. *Basic Electronics & Linear Circuits, by N.N. Bhargava*
2. *Electronic Devices and Circuits, by Bogart.*
3. *Microelectronics, by Millman.*

Periods / week – 03		Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100		Total marks – 125	Duration of exam – 3 hrs
WLE-203:	**DIGITAL SYSTEMS-II**		

I SEQUENTIAL LOGIC CIRCUITS

COUNTERS: Asynchronous or ripple counter, modulus counter, UP/Down Counters, decade counter, BCD counter. Synchronous counters, 4-bit Synchronous up counter, propagation delay, Counter applications.
REGISTERS: Shift Register, S I S O, S I P O, P I S O, P I P O. Shift register applications.

II D/A AND A/D CONVERTERS

Introduction. Interfacing with the analog world, Digital and analog signal conversion. D/A conversion-binary weighted resistor type, R-2R ladder type. Performance characteristics of D/A converter. Applications of D/A converters. A/D conversion-simultaneous A/D converter, successive approximation type A/D converter, stair step ramp A/D converter. Performance characteristics of A/D converter. Flash A/D Converter, Sample and Hold Circuits, Application of A/D converters.

III DIGITAL LOGIC FAMILIES

Bipolar logic family, unipolar logic family, characteristics of digital ICs. Propagation delay, fan in – fan out, noise immunity, power dissipation, figure of ment, operating temp, power supply requirements. Logic families: RTL, DTL, TTL, ELL, I^2L, MOS, CMOS, logic.

IV SEMICONDUCTOR MEMORIES

Introduction: Memory types, classification of memories, memory organization, reading and writing, RAMs, ROMs and PROMs. ROM: ROM organization, ROM tuning, types of ROMs. Semiconductor RAMs: Static RAMs, dynamic RAMs, Non-volatile RAMs. Charge couple devices (CCD).

V PROGRAMMABLE LOGIC DEVICES

Introduction: ROM as a PLD. Programmable logic array (PLA), block diagram of PLA, field programmable logic array (FPLA), application of PLAs, programmable logic sequencer.

BOOKS RECOMMENDED

1. *Digital Fundamental 3rd Edition - Floyd*
2. *Digital Electronics and Microcomputers, by R.K. Gaur.*
3. *Microelectronics by Millman & Grabel*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-204:	**MEASUREMENT & MEASURING INSTRUMENTS**	

I INTRODUCTION

Definition - Mechanical, Electrical and Electronics instruments. Accuracy and precision. Static sensitivity. Resolution and error. Principle of working, constructional features of moving coil instruments. Moving iron instruments. Extension of range of moving coil instruments. Rectifier type instruments. Analog Multimeter.

II MEASUREMENT OF POWER AND ENERGY

Constructional feature and working of dynamometers type wattmeter. Single phase induction type energy meter. Measurement of power at audio and radio frequency.

III MEASUREMENTS OF CIRCUIT ELEMENTS

A.C. Wheat stone bridge. Maxwell's inductance bridge, Maxwell's capacitance bridge. Hay's bridge. Wien's bridge and tuned bridges.

IV CATHOD RAY OSCILLOSCOPE

Block diagram, description and basic controls of a typical CRO. Constructional features of Cathode Ray Tube. Circuit arrangements for brightness, focusing and deflection control. Time based circuits - free running and triggered mode. Synchronization. Power supply circuit. Uses of C.R.O. for the measurement of frequency, phase shift etc.

V SIGNAL GENERATORS

Block diagram and description of A.F. and R.F. Generators. Standard signal generators. Sweep generator. Marker.

BOOKS RECOMMENDED

1. *Electrical Instruments & Instrumentation, by A.K. Sawhney*
2. *Fundamentals of Electrical Engineering, by Ashfaq Husain*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-205:	**PRINCIPLES OF COMMUNICATION**	

I INTRODUCTION

Introduction to communications and its block diagram. Representation of different types of signals. Data representation, data transmission, NOISE. Transmission channel bandwidth. Baud.

II MODULATION AND MULTIPLEXING TECHNIQUES

Purpose of modulation, AM-theory, sidebands, mod. index. FM-spectrum, mod. index. Power inside bands and carrier. Basic concept of phase modulation, introduction to PCM. ASK, FSK and PSK. MODEMS, Data transmission modes, Multiplexing. Need and types. Time division multiplexing. Frequency div. Multiplexing.

III PROPAGATION OF RADIO WAVES

Basic idea of EM waves, their characteristics, radio communications frequencies and wave lengths. Reflection, refraction interference, diffraction etc. Definition of wave length, plane of polarization, field strength. Multipath propagation. Fading. Causes and effects.

IV TRANSMISSION CHANNELS

Transmission lines, distributed constants of line, infinite line and its properties, reflection in transmission lines, SWR, lines terminated with characteristics impedance and with any other impedance. Optical fiber, HF radio wave propagation, ground wave, sky wave and space wave. Characteristics of ionospheric reflection of sky wave, virtual height, critical frequency, skip distance and MUF.

V ANTENNAS

Radiation from a dipole. Resonant and non-resonant antennas. Antenna parameters and characteristics. Radiation resistance, radiated power, directive gain, radiation pattern and polarization. Half-wave dipole antenna, folded dipole antennas HF and microwave antennas.

BOOKS RECOMMENDED

1. *Electronic Communications, by George Kennedy.*
2. *Electronic Communications, by Sanjeev Gupta.*
3. *Communication Systems, by Haykin Simon..*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-206:	FUNDAMENTALS OF MICROPROCESSORS	

I INTRODUCTION TO THE INTEL 8085

Definition of microprocessor, generations and types of microprocessors, most popular microprocessor. Architecture of 8085, brief description of ALU, CPU, register section, data & addr. Bus time sharing 8085 CPU pins and associated signal.

II PROGRAMMING THE 8085

Instruction, Group of instruction, Addressing modes of Instruction, 8085 instruction set. Machine Language, Assembly Language comparison, Assembly Language programming (Simple Problems).

III TIMING INSTRUCTION & EXECUTION

Machine, Instruction, Fetch, Read, Write(IO/MEM) cycle timing diagram, Interruption: Types of 8085 interrupt system, 8085 SID and SOD lines.

IV PERIPHERAL INTERFACING

PPLD'S, Brief description of 8255, 8251-USART, 8257-DMA Controller, Popular applications of Microprocessor in industry.

V ADVANCED MICROPROCESSORS

Introduction. Intel's 8086 architecture and addressing modes, Intel's 80186/Intel's 80286/Intel's 80386 – Architecture, memory management and programming model.

BOOKS RECOMMENDED:-

1. *Introduction to Microprocessor, by Mathur*
2. *Microprocessor and Microcomputers by Rafiquzzaman.*
3. *Microprocessor Architecture, Programming & Applications, by Goankar*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-301	**MOBILE COMMUNICATION**	

Unit-1 INTRODUCTION TO MOBILE COMMUNICATION

Evolution of Mobile Communication, Limitations of conventional mobile telephone system, Frequency Reuse and Cellular Approach, Interference and System Capacity, Power control for reducing interference, Cell splitting, Cell Sectoring, Intelligent Micro cells, Channel Assignment Strategies, Hand-off Strategies, A Basic cellular system, Inside a cell phone, Problems with cell-phones.

UNIT-II CHARACTERISTICS OF MOBILE COMMUNICATION

Introduction to radio propagation in wireless networks, Radio propagation mechanisms, Propagation path loss, Two-ray model for mobile radio environment, Distance power relationship, Shadow fading, Multi-path fading, Effects of shadow fading, Path-loss models for various cellular environments, Effect of multi-path & Doppler, Modeling of multi-path fading, Doppler Spectrum, Foliage loss, Radius of the active scatterer region.

UNIT-III DIVERSITY TECHNIQUES IN MOBILE COMMUNICATION

Introduction to diversity, linear combining & maximal ratio combining technique, space diversity, sectored antenna or angle diversity, adaptive angle diversity, polarization diversity, frequency diversity, time diversity, Implementation of a Rake receiver & its working, diversity receiver at the mobile unit as well as at the cell site.

UNIT-IV MULTIPLE ACCESS TECHNIQUES

Time division duplexing, Frequency division duplexing, Introduction to multiple access, Narrow band systems & wideband systems, Frequency division multiple access & its features, time division multiple access & its features, spread spectrum multiple access, code division multiple access, features of CDMA technique, hybrid multiple access, Space division multiple access, capacity comparison.

UNIT-V MOBILE SYSTEMS AND STANDARDS

Introduction to digital cellular mobile systems, global system for mobile communication (GSM): standardization & characteristics, GSM services & features, GSM Radio subsystems, frame structure for GSM, US Digital Cellular system IS-136, USDC radio specifications & its frame structure, CDMA Cellular System IS-95, Introduction to Low power wireless communication, CT2, DECT, PACS, & PHS.

REFERENCE BOOKS

1. T S Rappaport, "Wireless Communications", Pearson Education, Inc., 2004
2. W C Y Lee, "Mobile Cellular Telecommunications", McGraw Hill, 2nd Edn, 1995
3. R Pandya, "Mobile and Personal Communication Services and Systems", PHI, 2000.
4. K Pahlavan & P Krishnamurthy, "Principles of Wireless Networks", Pearson Education, Inc., 2004

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs

WLE-303:	**MICROELECTRONICS**

I MONOLITHIC IC TECHNOLOGY

Basic processing steps in ICs: Lithographic processes – mask making and pattern generation, lithography: optical, electron, x-ray and ion lithography, mask and printing defects, economics and yield.

II PROCESSES INVOLVED IN IC FABRICATION

Oxidation: growth mechanism of thick and thin oxides, oxidation techniques and redistribution of dopants. Diffusion: diffusion nature, one dimensional diffusion, atomic diffusion mechanism, evaluation techniques for diffused layers, ion implantation, penetration, annealing and ion implantation systems, epitaxial growth.

III IC PROCESSING TECHNOLOGIES

Isolations, self-alignment, local oxidation, MOS technologies, bipolar technologies, hybrid technology.

IV DEVICE FABRICATION & LAYOUT DESIGN

MOS-based, MESFET-based and BJT-based microcircuits, IC diode realization and properties, IC realization of resistors and capacitors, layout design rules.

V IC DESIGN & APPLICATION SPECIFIC ICs

Introduction to ASICs, advantages, problems and their solutions, various techniques of ASICs, advantages, problems and their solutions, various techniques of ASICs design, basics of HDL.

BOOKS RECOMMENDED

1. *SM Sze, "VLSI Technology", McGraw Hill.*
2. *C. Mead, L. Conway & Addison, "Introduction to VLSI Systems", Wesley Publishing Company.*
3. *Sorab K. Gandhi, "VLSI Fabrication Prinicples", Wiley International.*
4. *J. Millman, "Microelectronics", McGraw Hill Book Company.*
5. *R. Geiger, P. Allen & N. Strader, „VLSI Design Techniques & Digital Circuits", McGraw Hill.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-304:	**MICROWAVE & RADAR**	

I MICROWAVE TUBES

Constructional features, circuit and principle of working of Klystron amplifier. Constructional features, circuit and principle of working of reflex Klystron. Constructional features, circuit and principle of working of magnetron. Constructional features, circuit and principle of working of traveling wave tube.

II WAVE GUIDES

Elementary concept of wave guide transmission. Constructional feature, characteristics and applications of rectangular wave guides. Derivations of expressions for wave lengths, group and phase velocities in the wave guide and simple problems based on these.. Brief description with sketches of various wave guide accessories such as tees bends, twist, taper attenuator, phase shifter, directional coupler, isolator and termination tuner. Description of detector and detector mount. Impedance matching sections

III MICROWAVE ANTENNAS AND MICROWAVE MEASUREMENT

Constructional features ,characteristics ,types and applications of Parabolic dish antennaand Lens(metallic and dielectric)antennas.brief description of different types of feeds(Horn, slot, dipole, Helix, Spiral). Techniques to measure f,λ,α,ρ,VSWR,Q and other quantities.

IV RADAR

Introduction to Radar. & concept of ambiguous and unambiguous range. Classification and application of Radar. Block diagram and operating principle of a basic pulse Radar. Radar range equations,parameters involved,range equation. Pulse width, duty cycle, pulse repetition, frequency Block diagram and operation principle of CW and FMCW Radars and their applications.. Block diagram and operating principles of M T I and tracking radar.

V MICROWAVE SEMICONDUCTOR DEVICES

Limitation of Transistors at HF.Brief description and Schottkey barrier diode,varactor diode,tunnel diode,Gunn diode ,Impatt diode and PIN diode parametric Amplifier.

BOOKS RECOMMENDED

6. *Communication Systems, by Sanjeev Gupta*
7. *Communication Systems, by Kennedy*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-305:	**PRINCIPLES OF TELEVISION**	

I FUNDAMENTALS OF BLACK AND WHITE TELEVISION

Introduction to television system in brief, Picture elements and information, Principle of scanning and picture information, Interlaced scanning, Raster, Field and Line frequencies, Picture qualities: Brightness, Contrast, Resolution, Aspect ratio, Composite video signal (DC component, blanking pulses, Synchronizing pulses and equalizing pulses).

II FUNDAMENTALS OF COLOUR TELEVISION

Nature of visible light, Colour theory, Mixing of colours, Additive mixing, subtractive mixing, Attributes of colour-Hue, Brightness and Saturation, Luminance and Chrominance signals, Compatibility of Receiver, Colour camera system, colour difference signal, Gamma correction, Camera outputs on different colours, Frequency interleaving and bandwidth for colour signal transmission, Colour burst signal.

III TELEVISION RECEIVER CIRCUITS

Block diagram of monochrome and colour T.V (PAL-D) receiver, Function of each block including wave-shape and level of signals at the input and output of each block, Luminance signal processing, Colour signal processing, Colour burst and colour killer circuit, RGB matrixing circuit, Colour demodulator, ICs used in T.V.

IV PICTURE TUBES

Colour picture tubes: Construction and operation of delta gun, PIL, and Trinitron, Convergence and purity, Static and dynamic convergence, Degaussing, Raster distortion- Adjustment and correction, Power supply: Low and high voltage power supplies for picture tubes.

V ADVANCED TELEVISION SYSTEM

Microcotrolled electronic channel selection and tuning system (block diagram), Simplified schematic diagram and description of remote control receiver, Block diagram and description of colour receiver designed to receive telext signal. Digital television; 3-D television; Projectional television, Introduction to HDTV and CCTV, Block schematic and description of a new generation colour receiver.

BOOKS RECOMMENDED

1. Colour T.V Receiver by R.R . Gulati
2. Monochrome and Colour T.V Receiver by R.R . Gulati
3. Basic T.V and Video Systems by B.Grob
4. Modern Colour T.V Service manual- B.P.P Publications

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-306:	**ELECTRONIC INSTRUMENTATION & CONTROL SYSTEMS**	

UNIT-I INDICATING RECORDING INSTRUMENT

Classification and amplification of different type recorders (graphics recorder, strip chart recorder, simple point recorder, multi point recorder, ultraviolet recorder, magnetic tape recorders, digital tape recorders) and their applications. Classification of display (7 segmental displays, 14 segmental displays, 3x5 dot matrix, rear projection display, Nixie tube, light emitting diode, light crystal diode, segmental gas discharge displays.

UNIT-II ANALOG & DIGITAL INSTRUMENTS

Merits of electronics voltmeter. D.C. voltmeter with direct coupled amplifiers. A.C. voltmeter using rectifiers. Range for circuit, voltage and assistance, measurement, specification of an electronic voltmeter.
Schematic diagram and working principle of digital voltmeter (ramp type, integrating, successive approximation). Constructional feature and working principle of digital multi-meter. Principle of measurement and schematic diagram for time, frequency and period measurement by using universal counter.

UNIT-III TRANSDUCERS & INSTRUMENTATION AMPLIFIER

Basic principles of transducer, primary and secondary transducers, operation & construction of different type of transducers for measurement of force, strain, pressure, temperature, liquid & gas flow, pH. value, Instrumentation amplifier: Block & Circuit diagram.

UNIT-IV MISCELLANEOUS INSTRUMENTS

Principle of measurement distortion, distortion meter and harmonic analyzer. Block diagram and description of spectrum analyzer and Q meter. Elements of instrumentation system of recording by electrical signals, EEG, ECG (details of each block), Ultrasound.

UNIT-V AUTOMATIC CONTROL SYSTEMS

Block diagram of open and closed loop control system. Feed back and its effect on system performance. Stability and external disturbance. types of feed back control systems. Direct differential equations of physical systems. Block diagram algebra and signal flow graph.

BOOKS RECOMMENDED

1. *A course in Electrical & Electronics Measurements & Instrumentation, by A.K. Sawhney.*
2. *Instrumentation Devices & Systems, by C.S. Rangan, G.R. Mani*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-307:	**COMMUNICATION SYSTEMS**	

UNIT-I SATELLITE COMMUNICATION – I

Principle of satellite communication: Evolution and growth of communication satellites, synchronous satellites, international regulation and frequency coordination, satellite frequency allocations and band spectrum, general and technical characteristics of satellite communication system, advantages of satellite communication, active and passive satellites, introduction of analog and digital satellite communication.

UNIT-II SATELLITE COMMUNICATION – II

Satellite orbits and inclination: Introduction synchronous orbit, orbit parameters, satellite location with respect to earth, earth coverage and slant range, station keeping, satellite stabilization. Modems, multiple access formats, introduction of satellite earth stations, communication satellite sub-systems, satellite applications.

UNIT-III FIBER OPTIC COMMUNICATION

History of fiber optics, why optical fibers, introduction to light (reflection, refraction, dispersion, diffraction, absorption and scattering), manufacture and construction of basic fiber, single-strand fiber, basic single fiber cable, characteristics of light transmission through a glass fiber, classification of fibers, fiber losses, optical connectors.

UNIT-IV OPTICAL SOURCES

Introduction, Basic Concepts, Optical Emission from semi conductors, the semi conductor injection laser, simple frequency injection lasers, injection laser characteristics, injection laser to fiber coupling, non semi conductor lasers, narrow bandwidth and wavelength tunable lasers, mid infrared lasers, introduction to the light emitting diodes. Structure and characteristics, modulation.

UNIT-V OPTICAL DETECTORS

Introduction, device types, optical detection principles, absorption, quantum efficiency, responsivity, long wave length cutoff, semi conductor photodiodes without internal gain, semi conductor photodiodes with internal gain, mid-infrared photodiodes, photo transistors, photo conductive detectors.

BOOKS RECOMMENDED

1. Satellite communication by Robert M. Gagliardi, CBS publications and distributors.
2. Satellite communication by DC Agarwal, Khanna publishers.
3. Electronic communication systems by Kennedy & Davis, Tata McGraw Hill pub. company Ltd.
4. Optical fiber communications, principles and practice by John M. Senior, Pearson.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-308:	**NETWORK SYNTHESIS & FILTER CIRCUITS**	

I NETWORK FUNCTIONS AND THEIR REALIZABILITY

Network functions, properties of driving point functions, properties of transfer functions, poles and zeros, time response, frequency response, magnitude and phase plots of network functions, the biquadratic functions.

II INTRODUCTION TO FILTER CONCEPTS

Categorization of filters; low pass, high pass, band pass and band reject filters, gain equalizers, delay equalizers, passive, active and other filters.

III IMPEDANCE AND TRANSFER FUNCTION SYNTHESIS

Positive real function, reactance function, driving point synthesis: Synthesis of RC, RL, and LC driving point functions. Transfer function synthesis.

IV ACTIVE NETWORKS AND FILTERS

Active elements, operational amplifier, negative impedance converter, gyrators, generalized impedance converter, sensitivity, single amplifier filters, low pass, high pass, band pass and band reject filters.

V BASICS OF ACTIVE FILTER SYNTHESIS AND MONOLITHIC FILTERS

The cascade approach, biquad topologies, negative feedback topology, positive feedback topology, impedance scaling, frequency scaling, and coefficient matching technique, RC: CR transformation, UTA-based filters, introduction to switched capacitor networks.

BOOKS RECOMMENDED

1. *V.K. Aatre, "Network Theory and Filter Design", Wiley Eastern Limited.*
2. *G. Daryanani, "Principles of Active Network Synthesis & Design", John Wiley & Sons.*
3. *F.F. Xuo, "Network Analysis and Synthesis", John Wiley and Sons.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-191:	**ELECTRONIC WORKSHOP PRACTICE**	

OBJECT: (a) To become familiar with the resistor colour code and the use of an Ohm meter to measure resistance.
(b) To investigate the properties of potentiometer and preset.

2. Familiarization with fixed and variable capacitors.
3. Familiarization with different types of inductor transformer / chokes.
4. To become familiar with various types of diodes and to identify its P and N terminals.
5. To become familiar with n-p-n and p-n-p transistor and to identify its terminals.
6. (a) To control one lamp with one switch.
   (b) To control two lamps in series and parallel.
7. To make connection for stair case wiring using 2-way switches.
8. To make connection for go-down wiring using two-way and intermediate switches.
9. To install the conduit wiring and verify the lamp condition.
10. To make connection of C.T.S. wiring using a single-way switch.
11. Soldering practice of various types of circuits.
12. Fabrication, testing and fault-finding of battery eliminator.

BOOKS RECOMMENDED

1. Fundamental of Electrical Engg. by Ashfaq Husain.
2. Electrical Engg. by B.L. Thereja. (Vo. I and II)
3. Linear Circuits by N.N. Bhargava.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-192:	**ELECTRONICS & DIGITAL LAB-I**	

1. To verify the V-I characteristics of a Zener diode.
2. To plot forward and reverse characteristics of the given junction diode.
3. To plot the volt-ampere characteristics of LED.
4. To verify the relation between output D.C. and input A.C. voltage of half wave rectifier and trace the wave form.
5. To verify the relation between output D.C. and input A.C. voltage of full wave rectifier and trace the wave form.
6. To verify the relation between output D.C. and Input A.C. voltage of bridge rectifier and trace the wave form.
7. To verify voltage doubling action of half wave and full wave voltage doubler.
8. To plot the input and output characteristics of FET.
9. To verify the working of a parity checker / generator.
10. To verify NOR-gate as a universal gate.
11. To verify logical properties of Ex-OR gate.
12. To verify NAND-gate as a universal gate.
13. To construct a single bit comparator using NAND-gate.
14. To verify logical properties of half / full adders.

BOOKS RECOMMENDED

1. Basic Electronics & Linear Circuits by N.N. Bhargava.
2. Principles of Electronics by V.K. Mehta.
3. Digital Technology (Lab Manual) by Gerals E. Williams.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-291:	**ELECTRICAL ENGG. LAB**	

1. To find the resistance and inductance of the given coil by Ammeter and Voltmeter.
2. To verify Ohm's law by ammeter and voltmeter and to draw a graph between current (I) and potential difference (V).
3. To determine the efficiency of an electrical kettle by direct loading and finding resistance of the heating element.
4. Study of A.C. series circuit, measurement of power and power factor.
5. Calibration of single-phase energy meter with a wattmeter and a stop watch.
6. To measure the resistance of an ammeter and voltmeter by P.O. Box.
7. To verify law of resistance in series by ammeter and voltmeter.
8. To verify law of resistance in parallel by ammeter and voltmeter.
9. To study the construction of lamp starter, choke and To measure the power consumed by the lamp and voltage across the supply choke, lamp and also power factor.
10. Study of A.C. parallel circuit and measurement of power and power factor of the circuit.
11. To draw load efficiency curve for a single phase transformer by direct loading.
12. To perform open circuit and short circuit test on single phase transformer.
13. Determination of external characteristics of D.C. generator.
14. To measure power factor of an inductive load and non-inductive load and mixed load in series and parallel.

BOOKS RECOMMENDED

1. Fundamentals of Electrical Engg. by Ashfaq Husain.
2. Electrical Engg. by B.L. Thereja (Vol. I & II).

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-292:	**ELECTRONICS & DIGITAL LAB-II**	

1. To study the behavior of common collector amplifier and draw the curve between frequency Vs. gain.
2. (a) To study and plot the transfer characteristics for a Schmitt trigger.

   (b) To observe the output of a Schmitt trigger circuit.
3. To study the working of an astable multivibrator and to find the frequency of oscillation for different values of capacitor.
4. To test an electronic regulator and to draw input voltage Vs. output voltage characteristics curve.
5. To verify the working of summing amplifier.
6. (a) To study the inverting and non-inverting amplifier using operational amplifier.

   (b) To measure the gain of inverting and non-inverting amplifier with various feedback registers.
7. To observe the output wave form of Wein's Bridge Oscillator and to measure the amplitude and frequency of oscillation for different value of capacitance.
8. To construct an asynchronous binary up counter and down counter and study its operation.
9. To study and verify the operation of a 4-bit R-2R ladder network D/A converter.
10. (a) To study the operation of an SR flip-flop and verify its logical properties.

    (b) To verify logical properties for two flip-flop.
11. To trace the output wave form of the various type of clippers under different bias conditions.
12. To verify the operation of seven segment display / decoder.
13. To study FET as a voltage variable resister by plotting R_{DS} as a function of V_{DS} for very small value of V_{GS}.
14. Use U.J.T. as relaxation oscillator and to measure peak voltage and the time period of generated wave form.

BOOKS RECOMMENDED

1. Microelectronics by Millman & Grabel.
2. Digital Logic & Computer Design by M. Morris Mano

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-293:	**ELECTRONICS & COMMUNICATION LAB**	

1. To study the behaviour of common collector amplifier and draw the curve between frequency Vs. gain.
2. To study the working of an astable multivibrator and to find the frequency of oscillation for different values of capacitors.
3. (a) To study and plot the transfer characteristics of a Schmitt trigger circuit.

   (b) To observe the output of a Schmitt trigger circuit.
4. To plot the output wave form of Wien's bridge oscillator and to measure the amplitude and frequency of oscillation for different values of capacitors.
5. To verify the working of a summing amplifier.
6. To study and verify the operation of 4-bit R-2R ladder network D/A converter.
7. To verify the operation of seven segment display / decoder.
8. (a) To study the operation of SR flip flop.

   (b) To verify logical properties of two flip flops.
9. (a) To study an inverting and non-inverting amplifier using an operational amplifier.

   (b) To measure the gain of inverting and non-inverting amplifier with various feed back resistors.
10. To construct an asynchronous binary up and down counter and study its operation.
11. To study the "Low Pass active Filter" and draw the curve between the frequency and gain.
12. To study the "High Pass active Filter" and draw the curve between the frequency and gain.
13. To study an active band pass filter and draw the curve between frequency and gain.
14. To calculate the depth of amplitude modulation.

BOOKS RECOMMENDED

1. Communication System by Simen Kaykin.
2. Microlelectronic by Millman & Grabel.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-294:	**COMPUTER AIDED DESIGN & TESTING LAB**	

1. Draw the amplitude and phase spectra of different kinds of signals of given amplitude and duration (e.g. rectangular pulse, triangular pulse, sinusoidal signals, etc.).
2. Study and generation of amplitude modulated signal.
3. Study and generation of DSBSC signals.
4. Study and generation of SSBSC signals.
5. Study and generation of freeness modulated signal.
6. Study and generation of phase modulated signal.
7. Verification of sampling theorem for a sinusoidal signal.
8. Study and generation of PAM, PWM (or PDM) and PPM signals.
9. Study and quantization of different types of signals using mid-riser and mid-tread type quantizer.
10. Study of pulse code modulator and demodulator.
11. Study and generation of ASK, PSK and FSK signals,
12. Study of TDM and FDM signals.

BOOKS RECOMMENDED

1. Getting started with MATLAB by Rudra Pratap, Oxford University Press.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WLE-295:	**MICROPROCESSOR LAB**	

Report 1:	Addition of two 8-bits hexadecimal numbers stored in the memory by (a) direct addressing (b) indirect addressing
Report 2:	Addition of two 16-bits hexadecimal numbers stored in the memory by (a) immediate addressing (b) direct addressing
Report 3:	Addition of two 16-bits hexadecimal numbers stored in the memory by indirect addressing
Report 4:	Subtraction of two 16-bits hexadecimal numbers stored in memory by indirect addressing.
Report 5:	Subtraction of two 8-bits hexadecimal numbers using (a) direct SUB command (b) 2's complement method
Report 6:	(a) Addition of two 8-bits decimal numbers stored in the memory (b) subtraction of two 8-bits decimal numbers stored in the memory
Report 7:	Multiplication of two 8-bits hexadecimal numbers by successive addition method. Result should be of 8-bits
Report 8:	Multiplication of two 8-bits hexadecimal numbers by rotation method
Report 9:	Division of two 8-bits hexadecimal numbers by rotation method
Report 10:	Replace all bytes from memory location 2051 to 2055 by 00H
Report 11:	To find the successor and predecessor of a number stored in memory
Report 12:	a) Addition of a series of 8-bit hexadecimal numbers stored in the memory whose sum is of 8-bits
	b) Addition of a series of 8-bit hexadecimal numbers stored in the memory whose sum is of 16-bits
Report 13:	(a) Finding the number of 0's in a byte (b) Finding the number of 1's in a byte
Report 14:	Finding the larger of two 8-bits hexadecimal numbers
Report 15:	(a) Finding the largest number in a series of 8-bits hexadecimal numbers (b) Finding the smallest number in a series of 8-bits hexadecimal numbers
Report 16:	Multiplication of two 16-bits hexadecimal numbers stored in memory using direct addressing
Report 17:	To calculate the value of $\angle n$ where n is an 8-bit hexadecimal number. Assume $n<6$

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-391:	**ELECTRONICS & COMMUNICATION LAB**	

1. To calculate the depth of amplitude modulation.
2. To plot the frequency characteristics curve of active High Pass filter.
3. To study the "Low Pass active Filter" and draw the curve between the frequency and gain.
4. (a) To learn the operating characteristics of an astable multivibrator.

   (b) To verify experimentally the operating characteristic of a 555 timer used in an astable mode.
5. To study the active integrator circuit.
6. To draw the frequency response curve of an active band pass filter.
7. Study and test the Op-amp. based circuit for generating the ASK (Amplitude Shift Keying) and PSK (Phase Shift Keying) signals, use the circuits for generating APSK (Amplitude Phase Shift Keying).
8. Design and test a 2 x 1 digital multiplexer and a 1 x 2 digital de-multiplexer using 7400 IC.
9. Test the circuit of a phase detector using Ex-OR gate. Also calculate the phase shift introduced by the phase shifter circuit and compare the theoretical and practical results.
10. (a) To measure closed loop voltage gain of an Op. Amp.

    (b) To get data for calculating the gain band-width product.
11. To measure the slew rate of the 741 Op. Amp.
12. To demonstrate the operation of an Op. Amp. Phase shift oscillator and trace the wave form.
13. To study the active differentiator circuit.
14. To study the working of a difference amplifier and note down the output voltages for different input voltages.

BOOKS RECOMMENDED

1. Communication System by Simen Kaykin.
2. Microlelectronic by Millman & Grabel.

Periods / week – 03	Total no. of periods reqd. - 60	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-392:	**PROJECT LAB**	

1. Fabrication, testing, fault finding and frequency response curve of electronic circuit.
2. Main project (Project of students' own choice)

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLE-397:	**PROGRAMMING & SIMULATION LAB**	

OVERVIEW OF C

Introduction, importance of C, basic structure of C programs, sample C programs, executing a C program, problem solving and hints for flow charting.

CONSTANTS, VARIABLES AND DATA TYPES

C character set, keywords and identifiers, basic types of C constants and variables, assigning values to variables, reading data from keyboard, overflow and underflow of data, defining constant identifiers, some problems based on different variables (such as string variables) and data types.

OPERATORS AND EXPRESSIONS, MANAGING I/P AND O/P OPERATORS

Arithmetic operators, relational operators, logical operators, assignment, increment and decrement, conditional operators, special operators, some computational problems to illustrate the function of C operators, operator precedence and associatively, sequence of rules to evaluate expressions, mathematical functions, formatted input and output.

DECISION MAKING, BRANCHING AND LOOPING

Decisions making with IF statement and conditional (?:) operator (e.g. a program for leap year check). Programs based on IF-ELSE statement and switch case statement. Problems based on WHILE loops (e.g. sum and average of a series of numbers), problems based on DO WHILE loops (e.g. sum of an infinite series up to a desired accuracy), some problems based on FOR loop.

PSPICE / RSPICE

1. Introduction to SPICE simulation: Description of Spice, types of Spice, types of analysis.
2. Circuit description: Element values, nodes, circuit elements, sources, types of analysis, output variables, commands, format of circuit files and output files, examples of SPICE simulations.
3. DC circuit analysis: Resistors, modeling of elements, independent sources, DC output variables, types of output and analysis.
4. Transient analysis / AC analysis: Sources, output variables, output commands, response. AC output variables, independent sources, analysis and response.
5. Analog circuit simulation: Analysis of – diode circuits, BJT circuits, FET circuits and OPAMP circuits.

BOOKS RECOMMENDED

1. Programming in C by Balaguruswamy.
2. PSPICE by M. Rashid.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-101:	**FUNDAMENTALS OF COMPUTER**	

I INTRODUCTION

Importance of Computers, Computer generations, types of computers, computer languages (machine language, assembly language and high level language). Classification of computers (based on word length and based on µp chip used).

II CONCEPTS OF BASIC BUILDING BLOCKS

Basic block of a computer, central processing unit (ALU & control unit, registers), primary memory, RAM, static and dynamic RAM, Video RAM, shadow RAM etc. ROM, PROM, EPROM, EEPROM, secondary storage (floppy disk, optical disk, magnetic tape, Winchester disk, magnetic drum, magnetic bubble memory & hard disk).

III PERIPHERAL DEVICES

Input devices:- key board, pointing devices, scanning devices, touch tone devices, terminal etc. output devices:- Printers, plotters, monitors, voice output, add-on cards, serial and parallel ports.

IV SOFTWARE CONCEPTS

Operating system, utility programs, language processor, application programs. Computer viruses & vaccines. Basic idea of PC-Tools.

V PROBLEM SOLVING TECHNIQUES

Algorithms, flow charts, algorithm development for simple problems, structured programming, modular approach to programming, concept of OOPs, GUIs, brief introduction to WINDOWS environment.

BOOKS RECOMMENDED:

1. *Fundamentals of Computer, by Raja Raman V.*
2. *Computer Primer, by Satish Jain*
3. *Computer Studies, by C.S. French*
4. *Peter Norton's Computer 2nd Edition.*
5. *Computer Fundaments, by Pearl Software.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-102:	**PROGRAMMING IN 'C'**	

I PROGRAMMING TECHNIQUES AND OVERVIEW OF C LANGUAGE

Algorithm and Programming Development, Steps in development of a program. Flow charts, Algorithm development, Program Debugging, Program Structure. I/O statements, assignment statements, Constants, variables and data types. Operators and Expressions

II JUMPING, BRANCHING AND PROGRAM LOOPING

Control Structures, Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements.

III DERIVED DATA TYPES IN C

Functions: Introduction to functions, Global and Local Variables, Function Declaration Standard functions, Parameters and Parameter Passing, Call – by value/reference.

IV ARRAYS AND POINTERS

Arrays, Introduction to Arrays, Array Declaration, Single and Multidimensional Array: Arrays of characters, strings, Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays.

V STRUCTURE AND UNIONS

Structures and Unions: Declaration of structures, Accessing structure members. Structure Initialization, Arrays of structure, Unions

BOOKS RECOMMENDED:

1. *Programming in ANSI 'C' by E. Balagurusamy Tata McGraw Hill India*
2. *Let us 'C' by Y. Kanetkar BPB publication*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-206:	**COMPUTER ORGANIZATION**	

I ARCHITECTURE FUNDAMENTALS

Introduction, instruction execution, concept of parallel processing, pipelining, array processor, parallel instruction execution, CPU organization, architectural types: RISC Vs. CISC.

II MEMORY ORGANIZATION

Memory hierarchy, auxiliary memory, microprogrammed memory, cache memory: cache structure, replacement policies, writing into cache, virtual memory.

III PROCESSOR LOGIC DESIGN

Arithmetic logic unit: Design of arithmetic circuit, design of logic circuit, design of shifter.

IV CONTROL LOGIC DESIGN

Introduction, control organization, one flip flop per state method, sequence register and decoder method, microprogram control, microprogram sequence.

V COMPUTER DESIGN AND I/O ORGANIZATION

System configuration, computer instructions, timing and control, design of simple computer, properties of simple I/o and control and transfer of information between I/o devices, CPU and memory, introduction to Pentium processor.

BOOKS RECOMMENDED:

1. *Structured computer organization (Andrew S. Tannen baum).*
2. *Digital logic and computer design (M. Morris Mano).*
3. *Computer architecture by Rafiquzamman M. & Chandra S.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-207	**ALGORITHMS AND DATA STRUCTURES**	

I INTRODUCTION OF DATA STRUCTURE

Fundamental Notations Problem solving concept, top down and bottom up design, Concept of data types, variables and constants, Concept of pointer variables and constants. Arrays, Concept of Arrays, Single dimensional and Two dimensional arrays. Implementation using C language. File management using C.

II OPERATION ON ARRAYS AND LINKED LIST

Operations on arrays with Algorithms (searching, traversing, inserting, deleting). Linked Lists, Introduction to linked list and double linked list, Representation of linked lists in Memory, Traversing a linked list, Searching linked list, Insertion and deletion into linked list, Application of linked lists, Doubly linked lists, Traversing a doubly linked lists, Insertion and deletion into doubly linked lists.

III STACK, QUEUES AND RECURSION

Stacks, Queues: Introduction to stacks, Representation of stacks, Implementation of stacks, Uses of stacks, polish notation, Introduction to queues, Implementation of queues (with algorithm), Circular Queues, De-queues.

IV TREES

Trees: Concept of Trees, Concept of representation of Binary Tree, Traversing Binary Trees (Pre order, Post order and In order), Searching, inserting and deleting binary search trees. Graph theory terminology, adjacency matrix, path matrix, shortest path, Warshall's algorithm.

V SORTING AND SEARCHING ALGORITHMS

Sorting and Searching, Introduction, Search algorithm (Linear and Binary), Concept of sorting, Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Radix Sort, Heap Sort).

BOOKS RECOMMENDED:

1. *Theory & problems of Data Structures by Seymour Lipschutz, Tata McGraw Hill India*
2. *Data Structures using C & C++ by Aaron M. Tanenbaum PHI*

PROPOSED SYLLABUS (Session – 2012 -2013)

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-207	**ALGORITHMS AND DATA STRUCTURES**	

I INTRODUCTION OF DATA STRUCTURE

Introduction, data structure, data structure operations, data organization, algorithm: complexity, time space tradeoff, sub-algorithm, variables, data types. Arrays: representation of arrays, traversing linear arrays, inserting and deleting, multidimensional arrays, pointer arrays. Records: Records structure, representation.

II LINKED LISTS: REPRESENTATION AND OPERATIONS

Linked Lists: Representation of linked lists in memory, traversing, searching, insertion and deletion. Memory allocation, garbage collection, header linked list, two way lists.

III STACK, QUEUES, RECURSION

Introduction, stacks, array representation of stacks, sorting on stacks (quick sort). Recursion. Implementation of recursive procedure by stacks. Queues: deques, arithmetic expression, polish notation.

IV TREES & GRAPHS

Binary trees, representation of binary trees in memory traversing. Binary search trees. Searching, inserting and deleting in binary search trees, heap; heap sort, huffman's algorithm, general trees. Graph theory terminology, adjacency matrix, path matrix, shortest path, Warshall's algorithm, operations on graphs.

V SORTING AND SEARCHING ALGORITHMS

Sorting: Bubble Sort, insertion sort, selection sort, merge sort, merging, radix sort, searching and data modification, hashing.

BOOKS RECOMMENDED:

1. *Data Structures by S.Lipsuitz by Schaum's Outline Series*
2. *An Introduction to Data Structures by Trembley and Sorenson,T.M.H Publications..*
3. *Data Structures by Elan Horwitz and Sartaj Sahani, Galgotia Publications.*
4. *R. Stewens "Graphics Programming in C", BPB Publications, 1995.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-208:	**SOFTWARE ENGINEERING**	

I INTRODUCTION TO S/W ENGG. & ITS EVALUATION

Introduction to Software Engineering: The importance of software, evolution of software Engineering, software Engineering Paradigms, software development, life cycle, the classic life cycle, prototyping, iterative enhancement model, the spiral model, project management, project cost estimation, project planning.

II SYSTEM REQUIREMENTS ANALYSIS

System & Software Requirements Analysis: Computer Based Systems, Systems Engineering (Hardware, Software & Human Factors), System Analysis, Requirements Analysis, Software Requirement Specification, Structured Analysis (SSADM, DFD's, ER Diagrams).

III SOFTWARE DESIGN

The Design & Implementation of Software: Design objectives & principles, design fundamentals, modular design, design methodologies (Procedural design, object-oriented design), user interface design, Programming language fundamentals, coding style.

IV S/W TESTING & MAINTENANCE

Software Testing & Maintenance: Software testing techniques- Fundamentals, white box testing, basis path testing, control structure testing, black box testing, Software testing strategies, verification and validation, unit testing, integration testing, validation testing, system testing; Software Maintenance- Maintenance characteristics, reverse engineering & re-engineering, software configuration management.

V S/W QUALITY

Software Quality Assurance & International Standards: Software quality and software quality assurance, software reviews, formal technical reviews, software quality metrics, formal approaches to SQA, software reliability, ISO 9000 recommendations & requirements.

BOOKS & RECOMMENDED:

1. *Fairley, R.E. "Software Engineering Concepts", McGraw-Hill, 1985.*
2. *Jalote, P. "An Integrated Approach to Software Engineering", Narosa Pub.*
3. *Pressman, R.S. "Software Engineering: A Practitioner's Approach", 3rd ed. McGraw-Hill Inc. 1992.*
4. *Sommerville, I. "Software Engineering", Narosa Pub.*
5. *ISO 9001, "Quality System - Model for quality assurance in design/development, production, installation and servicing", Ist ed. 1987-03-15.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-301:	**WEB DESIGN & INTERNET DEVELOPMENT**	

I INTRODUCTION TO INTERNET PROTOCOLS

Introduction to internet, internet, intranets, internet vs. intranet (brief introduction), internet protocols and ISO OSI model, internet addressing, classes, dotted decimal notation, IP address, sub-netting, masking, domain name system, how internet works, brief introduction to internet application layer protocols – FTP, TFTP and TELNET etc.

II CONNECTING AND USING THE INTERNET

Application of internet, getting connected to internet – dial up connections, always on high speed connections, ISDN, wireless alternatives. Introduction to WAP, Bluetooth and blueyes etc. Internet accounts – shell account, TCP/IP account, client access account etc. overview of SLIP and PPP. Configuring windows 9x/2000/XP for internet.

III INTRODUCTION TO HTML AND FRONT PAGE

HTML and its applications, HTML basics, document tags, container and empty tags, working with HTML, text, emphasizing text imlicity and exlicity. Using lists in web documents, nested ordered, unordered lists, menu lists, directory lists, definition lists, graphics for web pages, working with links, tables, frames and forms.
Introduction to Microsoft front page-98, components of front page-98, building new web sites using front page-98, editing an existing web page using front page editor, creating links, adding images and special features to web, adding web functions, creating forms and connecting to databases, using the image composer.

IV PROGRAMMING IN JAVA

Overview of JAVA language, Constants, Variables and Data types, Operators and Expressions, Decision Making, Branching and Looping, Classes Objects and Methods, Array, Vectors and Strings. Brief introduction to Applets and Servelets.

V INTRODUCTION TO JAVASCRIPT

Introduction to scripting languages, function, events and the FORM object, frame and document objects, windows cookies and the navigator object, string and math objects. Application of JavaScript to professional web development.

BOOKS RECOMMENDED:

1. *Programming in JAVA by E. Balagursamy by TMH publications.*
2. *JAVA 2 Complete BPB publications.*
3. *Programming in JAVA 2 by QUE (Prentice Hall) publications.*
4. *MCSE networking guide by BPB publications.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-302:	**COMPUTER COMMUNICATION NETWORK**	

I INTRODUCTION

Computer Network, Computer Network Goals, applications of Computer Networks, Network criteria. Types of network connections, network topologies (like mesh, star, bus and ring), Categories of Networks (LAN, MAN and WAN), internet, meaning of protocol.

II OSI MODEL

Introduction, Data transmission in the OSI model, Physical layer, data link layer, network layer, transport layer, session layer, presentation layer, application layer, Protocol hierarchies, Addressing: Physical, logical, port and specific addresses.

III DATA LINK CONTROL

Asynchronous & synchronous serial transmission. Transmission media (Guided media and unguided media), introduction to data link control, flow control, error control, DLC protocols.

IV COMPUTER COMMUNICATION NETWORKING

Classification of networks on the basis of switching techniques, circuit switching. Message switching. Packet switching - data gram and virtual circuit types. Routing. WAN Technology (Frame relay and ATM).

V INTERNETWORKING

Connecting devices (bridges and gateways), principles of internetworking, types of internet connections, types of internet accounts, uses and services of internet, world wide web (WWW).

BOOKS RECOMMENDED:

1. *Data Communication & Networking by BA Forouzan; Tata McGraw Hill Pub. Company Ltd.*
2. *Data & Computer Communications, by William Stalling*
3. *Computer Networks, by Andrew S. Tanenbau; Prentice Hall*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-304:	**DATABASE MANAGEMENT SYSTEM**	

I INTRODUCTION

Introduction to database concept: Goals of DBMS including data independence, Data Management Architecture-interface between application programs and data management system. Classification of DBMSs based on H/W platforms.

II STORAGE STRUCTURES & DATA ORGANIZATION

Storage Structures – Possible representation for some sample data. Indexing Techniques: Hashing. The role of database administrator. Logical & Physical data organization.

III DATA MODELING & DESIGNING

The database development life cycle, Data Models: Hierarchical, network and relational models with a description of the logical and data structure representation of data base system. Detailed study of relational database management system – domains, attribute, keys etc.
Data normalization: Need for data normalization, first, second and third normal forms. Introduction to relational algebra and relational calculus, query facilities.

IV INTRODUCTION TO SQL

Simple SQL *plus commands – create table, insert, simple queries using SELECT, conditional queries, SQL operators – Arithmetic operators, character operators, comparison operators, logical operators, set operators. Handling null values, arranging query results, sub-queries, function in SQL *plus, concept of joins, simple joins, outer joins, self joins etc. Database maintenance activities – update, delete, drop table, and alter table commands. Simple view creation.

V DATABASE SECURITY AND NEW DATABASE APPLICATIONS

The need for security, physical and logical security, design issues, maintenance issues, operating system issues and availability, accountability, integrity, modern database applications – Data mining, data warehousing, knowledge databases, spatial and geographical databases.

BOOKS RECOMMENDED:

1. *Date, C.J.- Introduction to data base system. Vol. I*
2. *Dasai Vipin- Introduction to data base.*
3. *Database System, by A. Silberschatz & Henry F. Korth.*

Periods / week – 03		Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100		Total marks – 125	Duration of exam – 3 hrs
WLC-305	**OPERATING SYSTEM**		

I INTRODUCTION & EVOLUTION OF OPERATING SYSTEM

Definition of operating system. Evolution of Operating System, Types Of Operating System, Batch System, Concepts Of Multiprogramming And Time Sharing, Parallel, Distributed, and Real Time System, Network Operating System, Operating System Structure, Components And Service, System Call, System Programs, Virtual Machine, concept of process and threads.

II PROCESS MANAGEMENT

PCB, Process Scheduling, Scheduler Types, Co-Operating Process, Process Creation and Termination, Inter-Process Communication, CPU Scheduling: CPU Scheduler, Preemptive & Non Preemptive Scheduling, Scheduling Criteria, Scheduling Algorithms FCFS, SJF, Priority, And Round Robin Scheduling, Gantt Chart. Process Synchronization: The Critical Section Problem, Algorithms To Solve Critical Section, Semaphore, Classical Problems Of Synchronization. Dead Lock: System Model, Characterization, Resource Allocation Graphs, Methods Of Deadlock Handling: Dead Lock Prevention, Avoidance and Detection, Recovery from Dead Lock, Combined Approach to Deadlock Handling

III MEMORY MANAGEMENT

Concept of memory management. Address Binding, Dynamic Loading, Dynamic Linking, Overlays, Logical And Physical Address Space, Swapping, Contiguous Allocation Space, Single Partition, Multiple Partition Allocation, External And Internal Fragmentation. Paging, Segmentation, Protection and Sharing Virtual Memory Management: Demand Paging and its Performance Page Replacement Algorithm, Allocation of Frames, Global and Local Allocation, Thrashing

IV SECONDARY STORAGE MANAGEMENT

File System: File Concepts, File Attributes, Operations on Files, Access Methods: Sequential, Direct Access, Directory Structure, Protection File-System Implementation: File System Structures, Allocation Methods: Contiguous, Linked, And Indexed Allocation. Free Space Management, Efficiency and Performance Disk Management: Disk Structure & Scheduling Methods: FCFS, SSTF, SCAN, And CSCAN

V SECURITY AND PROTECTION

Protection And Security: Goal Of Protection, Domain Of Protection, Access Matrix, Security Problem, Authentication, One Time Password, Program Threats, System Threats. Case Study: case study of Linux, and Windows NT

REFERENCE BOOKS:

1. *Silberschatz, Abraham: operating system concepts*
2. *Harvey M. Deitil: An introduction to Operating System.*
3. *Godbole. A.S. : Operating Systems.*
4. *Milan Milenkov: Operating System Design and Concepts*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-307:	**COMPUTER GRAPHICS**	

UNIT I: INTRODUCTION TO COMPUTER GRAPHICS

Introduction to graphics fundamentals, pixels and frame buffer, resolution. Display devices: CRT, beam penetration, shadow-mask color display, storage tube DVST, plasma panel, laser scan display. Random scan, raster scan, refresh cycle, interlacing. Graphical input devices and input techniques. Classification, advantages and application areas of computer graphics.

UNIT II: C GRAPHICS

Difference between text and graphics modes. Graphics.h header in turbo C, initgraph(), closegraph(), graphics mode and driver, BGI. Basic C graphics functions: putpixel(), line(), moveto(), lineto(), rectangle(), bar(), circle(), ellipse(), arc(), outtextxy(). Stype and formatting functions: setlinestyle(), settextstyle(), setfillstype(), setcolor(), fillelipse(), floodfill(), setviewport(). Image handling functions: imagesize(), getimage(), putimage(), animation. Interaction with mouse: Functions to initialize mouse, to display and hide mouse pointer, and to get mouse position and button status.

UNIT III: POINT PLOTTING TECHNIQUES

Point plotting techniques, incremental methods, criteria for good computer generated line. Line drawing algorithms: Simple and symmetric DDA, Bresenham algorithms. Generation of circle and other curves.

UNIT IV: TRANSFORMATIONS

Two-dimensional transformations: Principles, translation, rotation, scaling and concatenation matrix representation of transformations, Inverse transformations. Three-dimensional transformations.

UNIT V: CLIPPING AND GRAPHIC PACKAGE DESIGN

Clipping: Cohen–Sutherland line clipping algorithm, mid-point subdivision line clipping, Sutherland-Hodgman polygon polygon clipping algorithm. Windowing: Windows and viewports, Viewing transformation. Design of simple computer graphics package: Ground rules for graphics software design, functional domains and function sets – graphics primitives, windowing and miscellaneous functions. Example: graph plotting program.

BOOKS RECOMMENDED:

1. *Newman & Sproull, "Principles of Interactive Computer Graphics", TMH*
2. *Hearn & Baker, "Computer Graphics", PHI*
3. *Kanetakar, Y., "Graphics under C", BPB*
4. *Stewens, "Graphics Programming in C", BPB*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WLC-308:	**AUTOMETA & COMPILER DESIGN**	

I INTRODUCTION OF AUTOMATA

Mathematical Preliminaries: Sets, Relations and Functions, Graphs and Trees, Strings and Their Properties, Principle of Induction; Theory of Automata: Definition of an Automaton, Finite Automaton, Transition Systems, DFA and NDFA, Mealy and Moore Models, Minimization of Finite Automata.

II REGULAR EXPRESSIONS

Formal Languages: Basic Definitions and examples, Chomsky Classification of languages; Regular Sets and Regular Grammars: Regular Expressions, Finite Automata and Regular Expressions, Pumping Lemma for Regular Sets, Application of Pumping Lemma, Properties of Regular Sets, Regular Sets and Regular Grammars.

III INTRODUCTION TO COMPILERS

Introduction to compilers, Compilers and Translators, Phases of Compiler, Symbol Table, structure of compilers, compilers writing tools, programming language grammar, Ambiguity.

IV PARSING

Role of Lexical analyzer, Specification and recognition of tokens, simple approach to design of lexical analyzer, Lexical errors, top down parsing, bottom up parsing, Predictive parsing, error handling in parsing, syntax directed translation.

V COMPILATION OF VARIOUS STATEMENTS

Translation of assignment statement, Boolean expressions and flow of control statement into intermediate code. Error detection and recovery, problems in code generation, simple code generator, code optimization.

BOOKS RECOMMENDED:

1. *Aho & Ullman:Compilers: Principles, techniques and Tools, Addison Wesley*
2. *Dhamdhere: Compiler Construction Principles and Design.*
3. *Aho & Ullman: Principle of Compiler Design, Narosa Publishing House*
4. *K. L. P Mishra &N. Chandrashekhran: Theoty of Computer Science: Automata, Languages & Computation, PHI*
5. *J. E. Hopcroft & J. D. Ullmann: Introduction to Automata Theory, Languages and Computation, Narosa Publication*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 60
Exam marks – 40	Total marks – 100	Duration of exam – 3 hrs
WLC-193:	**PROGRAMMING LAB-I**	

1. Programming exercises on executing and editing a C program.
2. Programming exercises on defining variables and assigning values to variables.
3. Programming exercises on arithmetic and relational operators.
4. Programming exercises on arithmetic expressions and their evaluation
5. Programming exercises on formatting input/output using printf and scarf.
6. Programming exercises using if statement.
7. Programming exercises using if – Else.
8. Programming exercises on switch statement.
9. Programming exercises on do – while statements.
10. Programming exercises on for – statement.
11. Programs on one-dimensional array.
12. Programs on two-dimensional array.
13. (i) Programs for putting two strings together (ii) Programs for comparing two strings.
14. Simple programs using structures.
15. Simple programs using pointers.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WLC-291:	**MICROPROCESSOR LAB**	

Report 1: Addition of two 8-bits hexadecimal numbers by (a) Immediate addressing (b) Direct addressing

Report 2: Addition of two 16-bits hexadecimal numbers stored in the memory by (a) immediate addressing (b) direct addressing

Report 3: Addition of two 8-bits and 16-bits hexadecimal numbers stored in the memory by indirect addressing

Report 4: Subtraction of two 8-bits hexadecimal numbers using (a) direct SUB command (b) 2's complement method

Report 5: (a) Addition of two 8-bits decimal numbers stored in the memory (b) subtraction of two 8-bits decimal numbers stored in the memory

Report 6: Multiplication of two 8-bits hexadecimal numbers by (a) Successive addition method (b) Rotation method. Result should be of 8-bits

Report 7: Write PSW after the following logical operations on two 8-bits hexadecimal numbers stored in memory (a) AND (b) EX-OR

Report 8: Division of two 8-bits hexadecimal numbers

Report 9: Replace all bytes from memory location 2051 to 2055 by 00H

Report 10: To find the successor and predecessor of a number stored in memory

Report 11: a) Addition of a series of 8-bit hexadecimal numbers stored in the memory whose sum is of 8-bits

b) Addition of a series of 8-bit hexadecimal numbers stored in the memory whose sum is of 16-bits

Report 12: (a) Finding the number of 0's in a byte (b) Finding the number of 1's in a byte

Report 13: Finding the larger of two 8-bits hexadecimal numbers

Report 14: (a) Finding the largest number in a series of 8-bits hexadecimal numbers (b) Finding the smallest number in a series of 8-bits hexadecimal numbers

Report 15: Multiplication of two 16-bits hexadecimal numbers stored in memory using direct addressing

Report 16: To calculate the value of $\angle n$ where n is an 8-bit hexadecimal number. Assume $n<6$

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WLC-292:	**SOFTWARE LAB**	

Introduction to Windows2000 and XP operating systems, creating/sharing new folders, copy the folders/files. Control panel: Display, date/time, add/remove program, printer, keyboard, mouse, fonts, desktop themes. Introduction to WINZIP and its use, JPEG, MPEG. Test editors: Introduction to text editors, notepad, WordPad etc. Introduction to MS-Office: MS-Word (laying a document, working faster and better, styles for consistent and easy formatting, desktop publishing with word, writing reports and papers). MS-Excel: Excel basics, excel formulae and functions, using the chart wizard. Internet explorer: Browsing the internet with the IE, using WEB components. A small project report to be submitted by each student in groups.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WLC-293:	**PROGRAMMING LAB-II**	

UNIT I: QUICK OVERVIEW OF C LANGUAGE

Editing, compiling and executing a C program, a very simple program, a weight conversion program, weight conversion table with loops and conditions, weight conversion table using a function, weight conversion with a prompt, weight conversion with command line arguments, Fibonacci series using an array and pointers.

UNIT II: CONSTANTS, VARIABLES, DATA TYPES, TYPE CONVERSION, OPERATORS, EXPRESSIONS, DECISION MAKING AND LIBRARY FUNCTIONS

Area of circle program (demonstration for using constants), area of circle with variables, area of circle using constants and variables with a prompt, programs demonstrating use of various C data types, programs demonstrating ranges of different data types and garbage values, programs to fetch ranges of different data types on a platform, type conversion programs (automatic and using type caste), programs demonstrating use of several C operators. Decision making using if statement (e.g. a function evaluation program defined in a given range), decision making using if-else (e.g. a program for leap year check), decision making using if-else-if and switch case statements (e.g. program to display a menu on the screen), unconditional control transfer using goto, loops using goto (e.g. program to display a number 100 times on screen), library functions (e.g. sin(x), cos(x), getchar(), getch() etc).

UNIT III: LOOPS, ARRAYS, STRING MANIPULATION AND STRING HANDLING FUNCTIONS

Problems based on while loops (e.g. sum of a series), problems based on do-while loops (e.g. sum of an infinite series up to a desired accuracy), problems based on for loops (e.g. to pick the largest and smallest of a given series of numbers). Program demonstrating defining, assigning values and printing values from an array (e.g. to increase each element of an array by 5), searching (linear search, binary search etc.) and sorting (bubble sort, quick sort, insertion sort and merge sort etc.), two dimensional arrays, matrix manipulation (e.g. addition of matrices, multiplication of matrices etc.). String manipulation with loops i.e. without using string handling functions (e.g. calculating length of a string without using strlen(), string manipulati9no using string handling functions (e.g. palindrome check program), two dimensional strings (e.g. manipulating a table of strings).

UNIT IV: USER DEFINED FUNCTIONS, MULTIPLE FILE PROGRAM, STRUCTURES & UNIONS

Calculator program with user defined functions, types of UDFs, parameter passing mechanisms (calculator program with each technique), storage classes in C (e.g. a program differentiating extern, static and local variables), multiple file programs (e.g. calculator program with multiple files). Defining, assigning values and printing values from a structure variable (e.g. student's record keeping system), structures and arrays, functions (e.g. books database program), difference between structures and unions.

UNIT V: USE OF POINTERS AND FILE MANAGEMENT

Pointers as address container variables, The & and * operators, accessing variables using pointers, pointers to pointers, pointers and arrays (e.g. accessing array elements using pointers, adding matrices suing pointers etc.), pointers and strings, pointers and structures, creating and managing files in C (e.g. student's database and book's database problems etc.).

LIST OF EXPERIMENTS FOR WLC-293: PROGRAMMING LAB-II

1. WAP in C to find the roots of a quadratic equation. Print the imaginary roots in the form of "a+ib"

2. WAP in C to read three sides of a triangle and check (a) if a triangle is possible or not (b) whether the triangle is right angled

3. (a) WAP in C to generate first n-numbers of Fibonacci series (b) WAP in C to calculate the sum of series 1+3+5+7+……upto n-terms

4. WAP in C to calculate the sum of the series $x - (x^3/3!) + (x^5/5!) - (x^7/7!) + \ldots\ldots\ldots \infty$

5. (a) WAP in C to find the largest and smallest number in the array
   (b) WAP in C to search an item in the given array
   (c) WAP in C to find the sum of diagonals elements of a given square matrix

6. (a) WAP in C to calculate the product of two given matrices
   (b) WAP in C to sort the elements of an array

7. (a) WAP in C to calculate the length of a given string
   (b) WAP in C to reverse the given string

8. (a) WAP in C to find whether the given string is palindrome
   (b) WAP in C to concativals two given strings

9. WAP in C to change the case of a given string (depending upon users choice) as follows:
   (a) lowercase to upper and uppercase to lower (b) sentence case
   (c) title case (d) to uppercase alternatively

10. WAP in C that uses a function called factorial to calculate the sum of the following series:
    $E^x = 1 + x + (x^2/2!) + (x^3/3!) + \ldots\ldots\ldots (x^n/n!)$

11. (a) WAP in C to check whether the given number is prime number
    (b) WAP in C using function to calculate the sum of the digits of a given number

12. WAP in C using function to reverse the digits of a given number

13. (a) WAP in C to design a structure for storing information of books
    (b) WAP in C to design a structure for storing information of students

14. WAP in C to filter the alphabets and digits from a given file (read.dat) and store them in a separate file (output.dat)

15. (a) WAP in C to copy the contents of one file (source.dat) into another file (destination.dat)
    (b) WAP in C to exchange the contents of two files

16. WAP in C to count the number of lines in a given file of alphanumeric text (data.dat)

17. WAP in C to initialize an integer array, character array, float array each consisting of 5 elements, use pointers to print the address of each element in each array

18. WAP in C to perform the following operations on the elements of a given array using pointers:
    (a) to double each element (b) to square each element (c) to print each element

NOTE: This lab is in continuation to the theory course WLC-102 (Programming in C).

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 75
Exam marks – 50	Total marks – 125	Duration of exam – 3 hrs
WLC-391:	**COMPUTER WORKSHOP**	

Practical 1: ABOUT COMPUTER CABINET

(a) Recognition of all the external computer connections, (b) tools needed to open the computer cabinet, (c) recognition of various cables and connectors, (d) jumper setting on motherboard.

Practical 2: DISASSEMBLING

(a) Disassembling the computer, (b) replacing the various components of computer (e.g. power supply, HDD, FDD etc.)

Practical 3: KEYBOARD

(a) Disassembling the keyboard by unscrewing the screw mounted on them, (b) repairing the keyboard by cleaning it with thinner.

Practical 4: CMOS SETTING

(a) Changing the CMOS setting, (b) date and time, (c) FDD, (d) boot sequence, (e) password setting.

Practical 5: HARD DISK

(a) Understanding the physical and logical organization of a computer HDD (b) Replacing and installing a HDD, (c) partitioning of HDD and formatting (d) master and slave (jumper setting).

Practical 6 HARDWARE INSTALLATION

(a) LAN card, (b) printer, (c) scanner, (d) zip drive

Practical 7: SYSTEM UNIT

(a) Assembling of ultimate computer, (b) connecting all the components needed to start the computer.

Practical 8: INSTALLATION OF SOFTWARE

(a) Installation of operating systems, (b) installation of anti virus software (c) installation of other required software.

Practical 9: DESIGN OF NETWORK CABLE

(a) Study of different cables and connectors used in networking (b) tools needed for crimping (c) crimping of CAT-5 cable, (d) connecting RJ-45 connectors.

Practical 10: NETWORKING

(a) Connectivity between 2 or more computers, (b) configuring server, (c) study of IP addresses, (d) sharing of files and folders, (e) sharing of printers.

Practical 11: INTERNET

(a) Internet connection and its installation (b) sharing the utility of internet through proxy server on LAN.

Practical 12: TROUBLESHOOTING AND MAINTENANCE

(a) Troubleshooting of H/W: checking various drives, keyboard, mouse, RAM, printers and parallel port configuration (b) troubleshooting of S/W: checking of drivers, OS, and other existing S/W (c) troubleshooting of LAN: checking of cable, connectors, IP addresses.

NOTE: After every practical, a report is to be submitted by each student individually before starting the next experiment.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 75
Exam marks – 50	Total marks – 125	Duration of exam – 3 hrs
WLC-392:	**CAD LAB**	

UNIT I: INTRODUCTION

Introduction to AutoCAD, H/W requirements to install the CAD S/W, starting up AutoCAD, about the AutoCAD graphics windows.

UNIT II: DROP DOWN MENUS

File, edit, view, insert, format, tools, draw, dimension, modify and window, about AutoCAD help.

UNIT III: FUNCTION KEYS

SNAP, ORTHO, POLAR, MODEL and GRID commands. Controlling text in drawing (TEXT, DTEXT, MTEXT), working with hatches and fills, using blocks, dimensioning a drawing, area, distance, pedit, zoom, pan, cal commands. Applying commands using keyboard.

UNIT IV: A LOOK AT DRAWING IN 3D

Extrude command, viewing a 3D drawing in different elevations, HIDE command, SOLID edit, REVSURF, RULESURF, SKETCH, ROTATE3D, REGION, BOUNDARY, BPOLY, 3DOBJECTS and different system variables. Printing an AutoCAD drawing.

UNIT V:

A small project to be submitted by each student individually with a detailed report.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 75
Exam marks – 50	Total marks – 125	Duration of exam – 3 hrs
WLC-393:	**PROGRAMMING LAB-III**	

Programming examples/ exercises demonstrated / assigned in the lab shall be based on the following topics:

S. No.	Topics
1.	Advanced C concepts – structures, printers, dynamic memory allocation, data structures implementation using C
2.	Need for object oriented programming, procedural Vs. object oriented languages, object oriented paradigms, basic structure of a C++ program, supported data types, programs based on decision making, looping, arrays and strings.
3.	Functions – what they do in C++ and not in C, multiple file programs, storage classes, objects and classes, constructors and deconstructors, overloaded deconstructors.
4.	Operator overloading, data conversion and inheritance.
5.	Virtual functions, polymorphism, files and streams, handling larger C++ programs.

TENTATIVE SCHEDULE OF LAB CLASS

Lab. No.	Topics	Lab. No.	Topics
1.	Structure	2.	Pointers basics, pointer to arrays, strings etc.
3.	Functions and pointers, pointers and structures	4.	Dynamic memory allocation, data structures implementation
PROGRAMMING ASSIGNMENT 1 AND SESSIONAL 1			
5.	Concepts of object oriented programming	6.	Programs based on arrays and strings
7.	Programs based on decision making, looping	8.	Basic structure of a C++ program, supported data types
PROGRAMMING ASSIGNMENT 2			
9.	Functions: what they do in C++ and not in C	10.	Multiple file programs, storage classes
11.	Objects and classes – 1	12.	Objects and classes – 2
13.	Constructors and deconstructors, overloaded deconstructors		
PROGRAMMING ASSIGNMENT 3 AND SESSIONAL 2			
14.	Operator overloading	15.	Data conversion	16.	Inheritance
PROGRAMMING ASSIGNMENT 4			
17.	Virtual functions	18.	Polymorphism
19.	Files and streams	20.	Larger C++ programs
PROGRAMMING ASSIGNMENT 5 and SESSIONAL 3			

1. Programming in C++ by E. Balaguruswamy, TMH Publications.
2. The Waite Group's: Object Oriented Programming in TURBO C++ by Robert Lafore.
3. Programming in C++ by H. Schidlt, TMH Publications.
4. Programming with C++ by Gotfried, Schaum's Outline Series, McGraw Hill Publishers.

Periods / week – 04		Total no. of periods reqd. - 100	Sessional marks – 125
Exam marks – 100		Total marks – 225	Duration of exam – 3 hrs
WLC-394:	**PROJECT**		

Students select their topics based on their knowledge of programming languages and application software with the consultation of their supervisor(s). The lab provides opportunity to work with contemporary programming languages, database management system software and web based software.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-102:	**FUNDAMENTALS OF INFORMATION TECHNOLOGY**	

UNIT-I INTRODUCTION

Information Technology-its concept and scope, prerequisites of information, Information Technology vs. Computer Science ,information technology and internet, careers in IT industry, societal impacts of information technology.

UNIT-II COMPUTER APPLICATIONS IN REAL LIFE

Overview, types of information needed by organizations, management structure and their information needs, how to design an operational information system, conceptual model of an application, computer system for transaction processing, steps in designing business information system.
System Design Example- Journal Acquisition

UNIT-III WEB MARKETING

Marketing on the web, marketing strategies, creating web presence, advertising, customer service and support, web branding strategies, web selling models.

UNIT– IV PERSONAL, SOCIAL AND ETHICAL ISSUES

Computers and your health-ergonomics, electromagnetic radiations, viruses, computer crime-salami shaving and data diddling ,computer intruders'
Cyberlaw: Intellectual property rights – basic ideas – copyright concepts – copyrights applied to softwares – software licensing – patents in software – Indian copyright law and provisions for software – Indian patent law and provisions for software (as amended in 2004) – various licensing models - arguments against copyrights and patents in software – free softwares – GPL software freedoms– open source softwares.

UNIT-V EMERGING TRENDS IN IT MANAGEMENT

Introduction to service management, ERP,CRM software, POS system, E-learning, What is Six Sigma?

BOOKS RECOMMENDED:

1. Introduction to Information Technology, by Pearson Education
2. Fundamentals of Information Technology, by D.S.Yadav
3. Introduction to Information Technology, by V.Rajaraman
4. Analysis and Design of Information Systems by V.Rajaraman

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-201:	**DESIGN OF MIS**	

I INTRODUCTION TO INFORMATION SYSTEMS

Data, Organization of Data, Information, Types of Information, Need for Information Systems, Computer Based Information Systems, Examples of Information Systems, Verities of Information Systems, Management Structure, Management and Information Requirements, Overview of design of an Information System.

II INFORMATION GATHERING AND SYSTEM ANALYSIS

Strategy to gather information, Information Sources, Methods of searching for Information, Interviewing techniques, questionnaires, various methods of Information search.
The Role and tasks of a System Analysis, Attributes of a System Analyst, Tools used by System Analyst.

III FEASIBILITY STUDY AND REQUIREMENTS SPECIFICATIONS

Deciding on Project goals, Examining alternative solutions, Cost benefit analysis, Feasibility report, Requirements specifications, Data dictionary, Data flow diagrams: Logical and Physical, Levels of DFDs, Decision tables, Entity-Relationship model.

IV DESIGN OF FILES

Files, Characteristics of Hard Disk and Floppy Disk storage, Processing sequential files, Processing random files, Inverted files, Indexed sequential files, Inverted files organization, Comparison of File Organization.

V CONTROL, AUDIT AND SECURITY OF INFORMATION

Controls in Information Systems, Audit of Information Systems, Testing of Information systems, Security of Information systems, Quality of information, Information System Design Examples.

BOOKS RECOMMENDED:

1. *Analysis and design of information system by Rajaraman V, T.M.H. Publications.*
2. *Business data processing by H.D Cliffton.*

Periods / week – 03		Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100		Total marks – 125	Duration of exam – 3 hrs
WIT-202:	**FUNDAMENTALS OF MULTIMEDIA**		

I MULTIMEDIA & TAXONOMY OF MULTIMEDIA

What is multimedia, why is multimedia important? How is multimedia changing the world (Mme-mail, video conferencing, training, entertainment). Classification of media types, characteristics of MM system, what is a multimedia PC (Hardware & software requirement). Text (Formatted & un-formatted, hyper-text). Graphics (what is graphics, raster graphics, vector graphics, component of graphic system, 3-D graphics). Audio: (what is audio, fundamental characteristics of sound, betrayed and file size, streaming audio). Animation (what is animation, file formats (animated gifs, flic, fla & swf, max). Images (what is image, type of images, specifications of digital images, image processing software and tools). Video:

II MULTIMEDIA COMPUTER COMPONENTS

System unit (central processor, RAM, color display, pointing device). Multimedia Accessories: (CD Rom, DVD, digital audio, audio speakers, sound card, video camera, MIDI), MPEG. Multimedia Read/Write Storage: Hard disk drive, recordable CD-ROM, PCMCIA and PC cards. Communications (Modems, network cards). Auxiliary Input: flat bed scanners, hand held scanners, digital camera. Modems & Network Interfaces: Serial & Parallel, Character encoding & error-checking codes.

III SOFTWARE THAT ENABLES MULTIMEDIA

System Software: operating systems, utilities, networking software. Development Software: graphics applications, sound applications, text applications, web development, multimedia authoring. Delivery Software: stand-alone programs, players.

IV MULTIMEDIA TOOLS AND TECHNIQUES

Screen Design Principles: Layout, font selection, text sizing, foreground, versus background, color, placing text on photographic background. Arranging text and pictures on the screen, metaphors, adopting a common look and feel. Graphics: Graphics Backdrops (frame.bmp, logo.bmp, photo.bmp). Hanging pictures, positioning graphics, resizing graphics, digital chalk, inspecting your custom file, list of graphics positioning commands. Triggering: Hypertex, hyperpicture, hypericons, editing icons, triggering multimedia objects from the backdrop, application as objects, deleting objects inspecting your custom file, list of triggering commands.

V DESIGN CONSIDERATIONS FOR MULTIMEDIA

Systems design techniques: Design in Architecture, Design in Engineering, Design in Graphics and the Arts, Design in Software Engineering, Design in Multimedia. Foundations of Interactivity Design: Modes of Communication with and Through Computers, Interface Metaphors and Principles, Relevant Research in Psychology, Theories and Tools for Development, Interaction Styles. Designing for Interactivity: Design Rules for Graphic and Screen Design, Dialog in Interfaces, Preventing and Handling Errors in System and Human, Intelligent Interfaces.

BOOKS RECOMMENDED:

1. *Multimedia literacy, II Edition by Fred T. Hofstetter.*
2. *An Interactive guide to multimedia by John Villamil-Casahova and Louis Molina..*
3. *Multimedia concepts and practice by Stephen McGloughlin.*
4. *Theoretical Foundations of Multimedia by Robert S. Tannenbaum*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-203:	**ACCOUNTING AND FINANCIAL MANAGEMENT**	

UNIT-I FINANCIAL ACCOUNTING

Meaning, objective and basic accounting terms, classification of accounts, double entry system of book keeping, accounting equation, recording of transactions, journalizing and ledger posting, preparation of trial balance, detection of errors and their ratification, nature, use and form, simple cash book, double column and three column cash book, petty cash book.

UNIT-II FINAL ACCOUNTS

Trading account-meaning, need and preparation, profit and loss accounts-meaning need and preparation, balance sheet-meaning need and preparation, use of further information for adjustment in preparation of final accounts (a) Depreciation (b) Provision for doubtful debts (c) Outstanding expenses (d) Prepaid expenses (e) Income received in advance and prepaid incomes (f) Broad classification of capital and revenue items (g) Closing stock

UNIT-III PARTNERSHIP ACCOUNTS

Admission of a partner, effects of admission of a partner, change in profit sharing ratio, goodwill-nature and method of valuation of goodwill, need for revaluation of assets and liabilities, retirement of partner (introduction).

UNIT-IV COMPANY ACCOUNT

Nature of company, accounting for a share capital, issue and allotment of shares, issue at par, premium, discount, call in advance, call in arrears, forfeiture and reissue of forfeited share.

UNIT-V BASIC ACCOUNT FOR "TALLY"

Starting of tally, company creation, chart of accounts, creation of ledger, voucher entry.

BOOKS RECOMMENDED:

1. Double Entry Book Keeping, by T.S Grewal, Sultan Chand & Sons.
2. A Text Book of Accountancy, by M/S. Franks Bros. & Co. Pvt. Ltd.
3. A Text Book of Accountancy, by M.S. Tata and McGraw Hill.
4. Accountancy Book I (NCERT)
5. Principles and Practices of Accounting by M/S Arya Publishing House, New Delhi.
6. Problems in Advanced Accounting, by R.L Gupta.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-301:	**ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM**	

UNIT-I PRODUCTION SYSTEMS AND SEARCH TECHNIQUE

Introduction to AI, application areas – NLP, computer vision, robotics. Problem solution as a state space search, production systems. Uniformed search: Breadth-first search, depth-first search, uniform cost search, bi-directional search, depth-first iterative deepening (DFID), limitations of blind search. Heuristic search: Best-first search, A*, IDA*, problem reduction and AO*, hill-climbing. Adversarial search: Game playing, mini-max search, alpha-beta pruning. Problems: water-jug, traveling salesman, route-finding, 8-queens, 8-puzzle, tic-tac-toe.

UNIT-II KNOWLEDGE REPRESENTATION

Prepositional logic: Identities, truth tables, resolutions, limitations. First order predicate logic: Interpretation of predicate formula, inference, prenex normal form, Skolemization, unification, resolution. Structured knowledge representation: Semantic networks, frame systems, inheritance.

UNIT-III FUNDAMENTALS OF ARTIFICIAL NEURAL NETWORKS

Structure and functioning of biological neural network. Artificial neuron models, computational model, activation functions, signal flow graph, architectural graph, supervised and unsupervised learning paradigms. Neural network architectures, feed-forward and feedback networks. Perceptron, XOR problem, multi-layer perceptron, error back-propagation learning. Radial basis function (RBF) networks, Adeline and Madeline.

UNIT-IV UNSUPERVISED LEARNING

Vector distances, Euclidean distance, Hamming distance, inner product, clustering. Linear Vector Quantization (LVQ), Bi-directional Associative Memory (BAM), Counter-propagation Network (CPN), Adaptive Resonance Theory (ART), Optical Neural Networks. ANN application areas.

UNIT-V INTRODUCTION TO EXPERT SYSTEM

Introduction, historical development and philosophical issues. Expert system components, shell, rule based architecture. Knowledge acquisition and representation, knowledge engineering, examples and application areas of expert systems, case study: MYCIN.

BOOKS RECOMMENDED:

1. *RichE, and Knight K "Artificial Intelligence", TATA McGraw Hill, 1995.*
2. *Russell S and Norvig P "Artificial Intelligence – A modern approach", Pearson.*
3. *Patterson DW "Introduction to Artificial Intelligence and Expert Systems", PHI.*
4. *Haykin S., "Neural Networks – A comprehensive foundation", Tata McGraw Hill.*
5. *Freeman and Skapura "Neural Networks – Algorithms, Applications & Techniques", Pearson.*
6. *Schalkoff R "Artificial Neural Networks", McGraw Hill.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-302:	**OBJECT ORIENTED PROGRAMMING & C++**	

UNIT-I INTRODUCTION TO OBJECT ORIENTATION

What is Object Orientation, Modeling the real world, Classes and Object, Objects storage in memory their lifetime & dynamic Objects, Metaclass, Inheritance, Polymorphism, Object Oriented analysis and design.

UNIT-II INTRODUCTION TO C++

Simple Programs, Variable Objects and their declarations, Keywords & Identifiers, Operators & expressions, Program Structure, Operator, Precedence & Associativity, Expression, Overflow & Underflow.

UNIT-III C++ LANGUAGE CONSTRUCTS

Conditional Statements – if statement, if-else statement, relational operator, comma operator, Switch statement, Program Looping – While statement, do statement, for statement, break and continue statement, go to statement, and avoiding gotos. Functions, arrays and strings, pointers and references.

UNIT-IV OOP FEATURES OF C++

Classes, objects, constructors, deconstructors, operators and function over loading, composition and inheritance, multiple inheritance, polymorphism method and problems related to these topics.

UNIT-V I/O HANDLING INI C++

Stream classes, the ios class, ios format flags, the I stream and o stream classes, unformatted input functions, unformatted output functions. Generic functions, Explicitly overloading a generic functions, overloading a function template, generic function restrictions, applying generic functions (a generic sort), generic classes. User default arguments with template classes.

BOOKS RECOMMENDED:

1. Programming in C++ by E. Balagursawamy, T.M.H. Publications.
2. The Complete Reference by Herbert Schildt.
3. OOP and C++ by David Parson; T.M.H. Publications.
4. Programming in C++ by Robert Lafore; Galgotia Publications.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WIT-304:	**NETWORKING ESSENTIALS**	

UNIT-I INTRODUCTION TO COMPUTER NETWORKS

Concept to Networking, Purpose of Networking, use of Computer Networks, NIC, functions of NIC, access methods, CSMA/CD, token passing access, types of errors, single bit, burst error, error detection and correction for block coding, parity check code, checksum and its performance, CRC codes, CRC encoder & decoder.

UNIT-II LAN

Project IEEE 802, IEEE 802.1, Ethernet 802.3, 10 Base 5, 10 Base 2, 10 Base T, 1 Base 5, 100 Base T, Frame format 802.3, other Ethernet networks like switched Ethernet, fast Ethernet, gigabit Ethernet, types of fast Ethernet like100 Base TX, 100 Base FX, 100 Base T4, comparison between gigabit Ethernet implementations, 10 Gigabit Ethernet, implementations and comparison.

UNIT-III VIRTUAL CIRCUIT NETWORKS

Frame relay, architecture, frame relay layers, address, extended address, FRAD's, VOFR, LMI. ATM design goal, ATM Qos, ATM LAN architecture, identities, ATM cell, ATM layers, AAL_1 and AAL_2.

UNIT-IV TCP/IP Protocol

Overview of TCP/IP and OSI, inter network protocol, addressing, classes, dotted decimal rotation, sub-netting, three level of hierarchy, masking, client-server model, DNS, FTP and SMTP, addresses, POP, HTTP, WWW.

UNIT-V WIRELESS NETWORKING

IEEE 802.11, Architecture, Mac sublayer Addressing Mechanism, Bluetooth architecture , Bluetooth layers , satellite networks, orbits footprint , three categories of satellites, GEO satellite, MEO satellite , LEO satellite .

BOOKS RECOMMENDED:

1. *Data Communications and Networking by Behrouz A. Forozan.*
2. *Telecommunications & the Computer, by James Martin*
3. *Data & Computer Communications, by William Stalling*
4. *Computer Networks, by Andrew S. Tanenbaum*

Periods/week-03		Total no. of periods reqd.-75	Sessional marks-25
Exam marks-100		Total marks-125	Duration of exam-3hrs
WIT-305:	**e-COMMERCE**		

UNIT-I INTRODUCTION

What is E-Commerce, Forces behind E-Commerce Industry Framework, Brief history of E-Commerce, Inter Organizational E-Commerce ,Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, benefits of e-commerce, e-commerce system architecture.
Network Infrastructure for E-Commerce, Market forces behind I Way, Component of I way, Access Equipment, Global Information Distribution Network, Broad band Telecommunication.

UNIT-II MOBILE COMMERCE

Mobile Commerce systems-characteristics and functions ,Mobile Computing technology-mobile clients, mobile client software ,Wireless Application Protocols, WAP Technology, wireless application development, wireless information devices m-commerce-trust, payment issues ,introduction to U-commerce :the next step after m-commerce.

UNIT-III WEB SECURITY

Introduction to Web security, Firewalls & Transaction Security, Client Server Network,
Emerging Client Server Security Threats, firewalls & Network Security.
Encryption, Secret Key Encryption, Public Key Encryption, Virtual Private Network (VPM), Implementation Management Issues.

UNIT-IV ELECTRONIC PAYMENTS

Overview of Electronics payments, Digital Token based Electronics Payment System (EPS), Smart Cards, Credit Card/Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

UNIT-V NET COMMERCE

EDA, EDI Application in Business, Legal requirement in E -Commerce, Introduction to supply Chain Management, CRM, issues in Customer Relationship Management.

Books Recommended:

1. Greenstein and Feinman, “E-Commerce”, TMH
2. Ravi Kalakota, Andrew Whinston, “Frontiers of Electronic Commerce”, Addision Wesley
3. Denieal Amor, “The E-Business Revolution”, Addision Wesley
4. Diwan, Sharma, “E-Commerce” Excel
5. Bajaj & Nag, “E-Commerce: The Cutting Edge of Business”, TMH

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 60
Exam marks – 40	Total marks – 100	Duration of exam – 3 hrs
WIT-191:	**COMPUTER APPLICATION-I**	

Introduction to Microsoft Windows 98/2000, MS-Office (Word, PowerPoint, Excel).

GETTING STARTED IN WORD

Setting up your screen, displaying and hiding rulers, selecting text, moving the insertion point, inserting and sizing picture, inserting, positioning and formatting text boxes, viewing the document, normal view, online layout view, page layout view, print preview, online view, split screen view, zooming the view.

SIMPLE FORMATTING

Character formatting, character formatting using the font dialog box, formatting using the formatting toolbars, formatting using keyboard shortcuts. Paragraph formatting, setting alignment, setting tables, setting indents, setting line spacing, setting spacing before and after paragraph.

PAGE LAYOUT AND STYLES

Language formatting, borders and shading, style formatting, applying styles, creating a new style, modifying a style, removing a style.

PRINTING A DOCUMENT

Using print preview, printing a document, printing all of a document, printing a different paper, choosing a paper source.

COLUMNS, TABLES AND SORTING

Columns: Creating columns quickly with the columns button, creating columns with the columns dialog box, changing the number of columns, starting a new column, removing columns from text.
Tables: Drawing a table with the draw table button, inserting a table quickly with the inset table button, inserting a table with the insert table command, converting existing text to a table, selecting parts of a table, adding and deleting cells, rows and columns, editing text in a table, copying and moving within tables, converting a table to text.

POWER POINT

Creating a representation, using the auto content wizard, using a template, creating a blank presentation, saving the presentation, power point five views, creating and editing slides, entering text in a slide, pasting in text from another application, selecting text.

DEVELOPING YOUR PRESENTATION

Changing the layout of a slide, modifying a slide master, changing the design template, outlining your presentation, rearranging your slides, previewing your slide show.

BRINGING A PRESENTATION TO LIFE

Inserting objects in your presentation, inserting a graph or chart, inserting a picture, inserting a sound, setting custom animations, playing a sound or video clip, using action setting.

EXCEL

Spreadsheet, worksheet and workbooks, parts of the excel screen, working with worksheets, moving about the worksheet, moving among worksheets, selecting worksheets, adding a worksheet, deleting a worksheet, renaming a worksheet, creating a spreadsheet, starting a new workbook, types of data in excel, entering data, saving and closing a workbook.

Periods / week – 02		Total no. of periods reqd. - 50	Sessional marks – 60
Exam marks – 40		Total marks – 100	Duration of exam – 3 hrs
WIT-192:	**CAD LAB**		

INTRODUCTION

Introduction to AutoCAD, H/W requirements to install the CAD S/W, starting up AutoCAD, about the AutoCAD graphics window.

DROP DOWN MENUS

File, edit, view, insert, format, tools, draw, dimension, modify and window. About AutoCAD help.

FUNCTIONS KEYS

ORTHO, POLAR, MODEL, GRID commands, controlling text in drawing, working with hatches and fills, using blocks, dimensioning a drawing. Applying commands using keyboard.

BASIC COMMANDS

Line, polyline, ray, construction line, polygon, rectangle, chamfer, fillet, multiline, scale, offset, block, insert, explode, point command, multiple command, divide measure, trim, extend, break, region, boundary, union, subtract, intersect, extrude, align, array, hatch, text, circle, arc, ellipse etc.

3-D COMMANDS

Box, dish, mesh, pyramid, sphere, torous, cone, wedge, rulesurf, revsurf etc.

Periods / week – 3	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WIT-291:	**PROJECT LAB-I**	

Students select their project topics base d on the theory courses “Design of MIS” and “Programming in C”,

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 3 hrs
WIT-292:	**COMPUTER APPLICATIONS-II**	

UNIT-I CREATING A DATABASE

How a database works, storing the data in tables, records and fields, a relational database, getting information from forms, queries and reports, designing your database, a quick geography lesson, two ways to create database, creating a database with the database wizard, creating a database from scratch, creating and refining database tables, creating a database table, importing data from another table or program.

UNIT-II BUILDING YOUR DATABASE TABLES

Opening a database table, ways of viewing tables, designing and refining a database table, creating a field, moving, copying, deleting and renaming fields, establishing field properties for easier data entry, creating a data-entry drop-down list, choosing the primary key, indexing a table field, forging the relationships between tables, seeing the relationships between tables, mapping relationships between table, changing and severing table relationships, changing a table appearance, changing the look of a datasheet, changing the width of columns and the height of rows, changing the order of columns, entering data in a table, entering data in a datasheet, editing data in a datasheet, forms for entering and viewing data, creating a form.

UNIT-III SORTING, FILTERING A DATABASE

Finding data in a database table, finding specific records, finding and replacing records, finding and replacing data, filtering to find data, filtering by form, filtering by selection, filtering by exclusion, sorting or arranging records in a database table.

UNIT-IV QUERYING A DATABASE

An introduction to querying, constructing a select query, creating the query, choosing which tables to query, choosing which fields to query, deciding how to sort thee query result, deciding which fields appear in the query results, entering the query criteria, seeing and saving the results of a query, the different kinds of queries, constructing a select query with the query wizard, advanced filter/sort: sorting on two fields, calculation: performing calculations on query returns, crosstab: displaying query results in a matrix, summary: getting comprehensive information about data in a field, top value: finding high and low values in fields, update: updating records in a database, append: copying data to a new table, make-table: creating a table from query results, delete: querying to delete records from tables.

UNIT-V GENERATING REPORTS AND MAILING LABELS

Generating reports, choosing hw to create your report, creating an autoreport, creating a report with the report wizard, customizing a report, opening a report you already created, printing a report, generating mailing labels.

BOOKS RECOMMENDED:

1. The complete reference Office2000 by Stephen L. Nelson, Tata McGraw Hill Publishing Co. Ltd., New Delhi.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 75
Exam marks – 50	Total marks – 125	Duration of exam – 3 hrs
WIT-391:	**COMPUTER MAINTENANCE & NETWORKING LAB**	

COMPUTER ASSEMBLY AND MAINTENANCE

Power supply, motherboard and chipset, memory (RAM & ROM), BIOS, secondary devices: types, methods and interface, input devices, parallel, serial and USB ports, output devices (printers – local and network).

NETWORKING

Connectors, cabling, crimping, installing LAN cards and other networking devices, assigning IP addresses, establishing communication, demonstration of various topologies using various devices (switches).

EXTENDING LANS

Bridging (S/W bridging), routing (S/W routing), H/W based routing (all experiments will be carried out using simulators), configuring different types of networks (peer-to-per, server based etc.), configuring various network servers, network troubleshooting: commands and case studies, case studies of campus and other networks.

Periods / week – 03	Total no. of periods reqd. - 60	Sessional marks – 75
Exam marks – 50	Total marks – 125	Duration of exam – 3 hrs
WIT-392:	**INTERNET AND APPLICATION LAB**	

UNIT-I INTRODUCTION TO FRONT PAGE

Page, folders, navigation, hyperlink, tasks, preview – normal, HTML.

UNIT-II RELATED TOPICS

Page templates, website templates, templates on Micsoft.com, frames pages, style sheets, photo gallery, pictures, themes, spreadsheets and charts, horizontal lies, border and shading, preview in browser.

UNIT-III ADVANCED TOPICS

Hover button, marquee, page, transition, banner ad manager, DHTML, web search, form, audio, video, page banner, online frame, bookmark, tables, background style, hit counter.

UNIT-IV PROBLEMS

- To design a library catalog system.
- To design your personal home page.
- To design a website for Women's' Polytechnic.
- To design a website for a fashion company.
- To design a logo for a company/institute of your choice.
- To design web pages for course structure syllabi and study material for your course.
- To design a web page using animations and also include audio and video.

Periods / week – 4	Total no. of periods reqd. - 100	Sessional marks – 125
Exam marks – 100	Total marks – 225	Duration of exam – 3 hrs
WIT-393:	**PROJECT LAB-II**	

Students select their topics based on their knowledge of programming languages and application software with the consultation of their supervisor(s). The lab provides opportunity to work with contemporary programming languages, database management system software and web based software.

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-101:	**INTRODUCTION TO MULTIMEDIA**	

I MULTIMEDIA BASICS

Definition of multimedia, Digital multimedia, Characteristics of multimedia systems, Multimedia data elements, Classifications of multimedia data, Benefits of multimedia systems, Challenges of multimedia system design, Impact of Multimedia (Telecommuting, Home shopping, Electronic Publishing, Teaching & Learning, Business & Advertising, Mergers & Alliances), Multimedia PC, Internet, World Wide Web, Text (printed, scanned, electronic, hypertext), Graphics (bitmaps, clipart, digitized pictures, hyper pictures), Sound (waveform audio, CD audio, enhanced CD, MIDI, hyper audio), Video (live video feeds, videotape, videodisc, digital video, hyper video), Animation (frame animation, vector animation, computational animation, morphing).

II MULTIMEDIA INPUT/ OUTPUT TECHNOLOGIES

Limitations of traditional input devices, Display and Encoding technologies, Resolution and Bandwidth issues, Electronic pen, Digitizer, Pen driver, Recognizer, Display system requirements, Performance issues, Video display technology standards, Output technologies, Laser and Dye sublimation printers, Color printers, Image scanners, Charge-Coupled devices.

III MULTIMEDIA PRODUCTION SYSTEMS

Multimedia development and delivery systems, storage devices, operating systems, video, audio and image capturing equipment, authoring and media integration, software - office integrated systems.

IV SYSTEM DESIGN: METHODOLOGY AND CONSIDERATIONS

Fundamental design issues, key deliverables, determining enterprise requirements, Technology assessment, Business information model, Examining current architecture and feasibility, Performance analysis and monitoring, Object- oriented Multimedia systems, Design examples; Introduction to Multimedia systems architecture; Issues in Multimedia Systems Design: Traffic analysis, buffer design, Traffic shaping, Scheduling.

BOOKS RECOMMENDED:

1. Fred T. Hofstetter, "Multimedia Literacy, II Edition", The McGraw-Hill Companies, Inc., 1997.
2. Prabhat K. Andleigh, " Multimedia Systems Design ", Prentice- Hall, 1995.
3. Blattner, Meera M, Roger B, " Multimedia Interface Design ", Addison -Wesley, 1992.
4. S.V. Raghavan and Satish K. Tripathi, "Networked Multimedia Systems: Concepts, Architecture and Design", Prentice-Hall, 1998.
5. www.cs.nps.navy.mil/people/faculty/xie/cs3202/notes_html/tsld002.htm

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-105:	**IMAGE PROCESSING AND ITS APPLICATION**	

UNIT 1

Digital image representation, fundamental steps in image processing, elements of digital image processing systems, image acquisition, storage, processing, communication, display. Digital image fundamentals, Elements of visual perception, structure of human eye, Image formation in the eye, brightness adaptation and discrimination, nonuniform sampling and quantization.

UNIT-2

Some basic relationships between pixels, connectivity, labeling of connected components, relations, equivalence and transitive closure, distance measures, imaging geometry, camera model, camera calibration, stereo imaging, photographic film, film structure and exposure, film characteristics, image enhancement, spatial filtering, smooth filters, sharpening filters, enhancement in the tray domain, low pass filtering, Highpass.

UNIT-3

Colour image processing, colour fundamentals, colour models, pseudo-colour image processing, full colour image processing.
Image Compression: Coding redundancy, interpixel redundancy, image compression models, the source encoder and decoder, the channel encoder and decoder, error free compression, variable length coding, bit plane coding, loss less predictive coding.

UNIT-4

Images segmentation: point detection, line detection, edge detection, combined detection. Representation and description, representation schemes, chain codes, polygonal approximations, signatures, boundary segments, knowledge of editing software like Corel Photopaint and CorelDraw 11.

BOOKS RECOMMENDED

1. Digital Image processing by Rafel C. Gonzalez and Richard E. Woods, Addison Wesley.
2. Fundementals of Digital Image Processing, Anil K Jain
3. Handbook of Image and Video Processing, Al Bovik

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-108:	**MULTIMEDIA IN TEACHING & LEARNING**	

COURSE OBJECTIVE

Define learning with multimedia. Describe the development of media in the history of alternate modes of education (e.g. distance education) as a function of interaction and independence. Identify the basic psychological processes involved in multimedia learning. Outline the basics of sensation and perception in processing multiple media. Explain the rationale of multimedia design principles. Identify the opportunities for learning and teaching that multimedia learning affords. Develop criteria for the evaluation of multimedia applications. Apply these criteria and critically analyze multimedia products. Develop a proposal for a multimedia project.

I INTRODUCTION AND OVERVIEW

Multimedia learning, generations of technological innovations in education, define multimedia learning in the context of distance learning/e-learning/online learning/computer-based learning (group work). Critically analyze the impact of the use of media on teaching and learning. Attributes of multimedia applications and opportunities for learning and teaching that they afford.

II EVALUATION AND TOOLS FOR MULTIMEDIA APPLICATIONS

Identify characteristics of educational software. Explore examples of multimedia learning environments. Learn about the systematic of evaluation processes. Compile criteria to evaluate multimedia learning environments. Develop an evaluation protocol. Prepare an evaluation review. Introduction to instructional computer and the impact of the computer on education. Usability as a quality criterion of multimedia learning environments. Usability testing. Brief introduction to word processor tools, photo editors and drawing tools. Digital movie editors and producers, spreadsheets and data bases and presentation tools.

III INTERNET USAGE, APPLICATION & TOOLS FOR ACADEMIC PURPOSES

HTML editors and design for the WEB. Programming languages, their usage and applications. Teacher utilities and management tools. Submission, discussion and evaluation of the short assignments and digital portfolios. Tools: MS Front Page and establishing Web servers, Scripting languages (client side and server side), MONDO, Bodington etc.

IV DEVELOPING A PROPOSAL FOR A MULTIMEDIA PROJECT

Learn to select suitable media representations of information for different target groups. Compile a multimedia project proposal. Identify barriers to success in implementing multimedia learning. Plan measures of quality assurance.

BOOKS RECOMMENDED:

1. Vaughan. T, “Multimedia: Making It Work”, Tata McGraw Hill, VIIth Edition.

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-109:	**ANIMATION DESIGN**	

I INTRODUCTION

A review of the basic computer graphics concepts with an emphasis on the basic 3D graphics pipeline, Representation and modeling of objects; polygonal representation vs. solid modeling methods, Basics of illumination models, Mathematical Light models, Types of Reflected Lights including ambient, diffuse, and specular light, Specifying light Material and Properties (Global, Light model parameters, Material properties, Light properties).

II IMAGE PROCESSING & TEXTURE MAPPING

Basics of representing, Storing, Displaying, Manipulating 2D images (Cropping, Scaling, and Combining Images), Mapping of image onto the surface of a 3D object, including texture subdivision, texture replication, and texture blending, Frames of reference, viewing systems, and 3D transformations for 3D Coordinate system.

III RAY TRACING & ANIMATION ELEMENTS

Ray tracing rendering algorithm including the calculation of shadows, reflections, and refraction, Illusion of Movement, Key Frame Animation, Forward and inverse Kinematics, Articulated structure.

IV ADVANCE TRANSFORMATION AND ANIMATION

Demonstration and supervision on animation techniques, shades, animation controllers, advance lighting, particle systems and rendering parameters, Detail organic modeling of a live character with inverse kinematics and character features such as facial expressions and components, skin properties, realistic renderings and cloth dynamics.

BOOKS RECOMMENDED:

1. Rechard Parent and Rick Parent, "Computer Animation: Algorithms and Techniques", Morgan Kaufmann Publishers, 1999.

2. F. S. Hill, Jr., "Computer Graphics Using OpenGL, 2nd Edition", Prentice Hall (2001).
3. Alan Watt, "3D Computer Graphics", Addison-Wesley (1996).
4. Vaz, C. and Mark, "ILM: Into the Digital Realm", London, Virgin Publication,1996.
5. Kelly and Doug, "Character Animation in Depth", Coriolis Az 1998.

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-201:	**VIDEO PROCESSING AND VIDEO PRODUCTION**	

I INTRODUCTION

Introduction/Course Overview; Analog video, Spatio-temporal sampling; Sampling structure conversion (without using motion)

II MOTION ANALYSIS

Real versus apparent motion, Spatial-temporal constraint methods (optical flow equation). Block-matching methods, Mesh-based methods, Region-based (parametric) motion modeling, Motion segmentation and layered video representations

III VIDEO PROCESSING AND COMPRESSION

Motion-compensated (MC) filtering, Noise reduction, Signal recovery and general inverse problems, Restoration (deblurring), Superresolution, Mosaicing, Deinterlacing, Frame-rate conversion (MC-Interpolation), Frame-based compression (principles behind MPEG-1/2), Scalable or layered frame-based compression, Object-based compression (principles behind MPEG-4)

IV VIDEO COMMUNICATION

Video streaming and error-resilience, efficient processing of compressed video Digital TV

BOOKS RECOMMENDED:

1. Y.Wang, J.Ostermann, Y-Q.Zhang: DIGITAL VIDEO PROCESSING & COMMUNICATIONS, Prentice-Hall, 2001 [Required].
2. A.Bovik & J.Gibson: HANDBOOK OF IMAGE & VIDEO PROCESSING, Academic Press, 2000 [Recommended]
3. A. N. Netravali and B. G. Haskell, *Digital Pictures – Representation, Compression and Standards,* 2nd ed. Plenum Press, 1995.

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-203:	**NETWORKED MULTIMEDIA**	

I OVERVIEW OF MULTIMEDIA SYSTEMS

Basic definitions, formats, delivery issues, Browsers, servers, protocols, caching

II COMPONENTS AND OPERATING SYSTEMS SUPPORT

Text, graphics, images, video, audio, documents, time, and money: JPEG, GIF, MPEG, MP3, MHEG, MIDI. File systems, support of databases involving images and video, scheduling issues

III NETWORK SUPPORT FOR MULTIMEDIA

Integrated Services Model (ISM), MBONE, RSVP (reservation protocol), RTP (real-time protocol), RTSP (real-time streaming protocol), NTP (network time protocol), Compression, quality-of-service, and synchronization.

IV APPLICATIONS AND EMERGING TECHNOLOGY

Principles, protocols, security, and implementation issues for emerging multimedia technologies such as e-commerce, m-commerce, video-on-demand, audio-video conferencing and collaboratories.

Additional Topics: Streaming Video, Video on Demand, IP/TV

BOOKS RECOMMENDED:

1. Networked Multimedia Systems: Concepts, Architecture and Design. Ralf Steinmetz and Klara Nahrstedt
2. Networked Multimedia system, S. V. Raghavan, Setulo K Tripathi
3. Understanding Networked Multimedia, Francis Fluckiyer
4. Multimdia Communications Networks: Teel & Sevees Multikariya Tatipamular, Bhump Khasrdrsh

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-204:	**MULTIMEDIA AUTHORING**	

I INTRODUCTION

Multimedia authoring system, Why should you use an authoring system, Multimedia Authoring Paradigms, Multimedia Programming vs Multimedia Authoring,.

II MULTIMEDIA AUTHORING AND USER INTERFACE

Design issues for Multimedia Authoring, Multi-source Multi-user authoring systems, Telephone authoring systems, Hypermedia application design, Attaching sounds and video clips to objects, User Interface design, special metaphors for multimedia applications, Audio/Video indexing functions, object display/ playback issues, Hypermedia messaging.

III MULTIMEDIA APPLICATIONS DESIGN

Issues in Multimedia Applications Design: Scripting (writing), Rules for good writing, Graphics (illustrating), Graphics Styles, Animation (wiggling), Audio (hearing), Types of Audio in Multimedia Applications, Interactivity (interacting), Types of Interactive Multimedia Applications: Technical Design, Visual Design, Storyboarding.

IV MULTIMEDIA SOFTWARE TOOLS

Digital Audio, Music Sequencing and Notation, Image/Graphics Editing, Animation, Authorware 7, IconAuthor, Director 8 Multimedia Studio, Lingo Authorized

BOOKS RECOMMENDED:

1. Andleigh, Prabhat K. & Thakrar, K., Multimedia Systems Design, Prentice-Hall, 1998.
2. Chapman, N., Digital Media Tools, Paperback (2003) John Wiley and Sons Ltd; ISBN: 047085748X
3. Elsom-Cook, M. (2001). Principles of Interactive Multimedia, ISBN 007-709610-X
4. Vaughan, T. (1998). Multimedia: Making it work, McGraw Hill, ISBN 0-07-882552-0

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-191:	**MULTIMEDIA LABORATORY – I**	

ADOBE PHOTOSHOP AND ADOBE IMAGE READY

I BASICS

Overview of the Adobe Photoshop. Image modes. Image size and resolution. Image color concepts.

II BASIC TOOLS AND COLOR

Overview of the Photoshop toolset. Brushes and brush types. Choosing colors by eye. Numerical color. Pantone color. Canvas color. Review and assignment.

III SELECTIONS AND MASKS

Marquee selection tools. Lasso & Wand selection tools. Selection tool. Select menu commands. Transforming selections. Quick mask mode. Alpha channels and channel palette. Mask/selection practice exercise.

IV LAYERS AND BLEND MODES

Intro to layers. Move, copy and transform layers. Advanced layer features. Applying layer effects. Layers review. Review and assignment.

V PAINTING TOOLS

Intro, paint bucket and fill command. Gradient, pattern and line tools. Brushes and fade command. Pencil, paintbrush and airbrush tools. Eraser tools.

VI RETOUCHING TOOLS

Retouching tools intro and tips. Blur, sharpen, smudge. Dodge, burn, sponge. Clone stamp, history brush, art history brush. Practice exercises. Review and assignment.

VII ADOBE IMAGE READY

Introduction to Image Ready. Opening and importing files. Image Reader workspace. Toolbox. Animation. Practice exercises. Review and assignment.

VIII PROBLEMS

Exercises based on Unit I to Unit VII.

Periods / week – 04	Total no. of periods reqd. - 50	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WMM-192:	**WEB PAGE DESIGN LAB (HTML, DHTML, JAVA SCRIPT)**	

I INTRODUCTION TO HTML

Introduction: html tags, paired tags ,structure of an html program, text formatting ,text styles, emphasizing material in a web page, **lists:** unordered list, ordered list, definition list, adding graphics to html documents, tables, **links:** external document references, internal document references, images as hyperlinks, image maps.

II BEYOND THE BASICS

Frames:<frameset>tag,<frame>tag, targeting named frames, **Forms**: text element, password element, button element, submit(button) element, reset(button) element, checkbox element, radio element, textarea element, select and option element, multi choice select lists element, grouping controls with fieldset and legend, adding multimedia to your web.

III STYLE SHEETS

Font attributes, color and background attributes, text attributes, border attributes, margin related attributes, list attributes, class, using tag, external style sheets, layer element, marquee element.

IV HTML SCRIPTS

JavaScript: Writing JavaScript into html, basic programming techniques, data types, literals, creating variables, JavaScript array, operators and expressions in JavaScript, condition checking(if-then-else, immediate if(conditional expression),for loop, functions in JavaScript(built-in functions, user defined functions),placing text in browser, dialog boxes(alert dialog box, prompt dialog box ,confirm dialog box), handling (web page) events using JavaScript.

EXERCISE

Design a website using concept of HTML, DHTML and JAVASCRIPT.

Periods / week – 06	Total no. of periods reqd. - 50	Sessional marks – 50
Exam marks – 100	Total marks – 150	Duration of exam – 3 hrs
WMM-292:	**MULTIMEDIA LABORATORY – II**	

3-D MODELING & ANIMATION

I IDENTIFYING THE WORK AREA AND CREATIVE PRIMITIVES

Getting to know the interface, customizing, setting units and grids, primitives, modifying parameters, quad menus and toggles, transformations, files formats and operations and exercise.

II WORKING WITH OBJECTS

Display and selection methods, cloning, group and ungrouping, alignments, max space concepts, hold and fetch, snaps, mirroring, basic rendering and exercise.

III WORKING WITH SPLINES AND COMPOUND OBJECTS

Arrays, working with splines, compound objects, max scene files and exercise.

IV WORKING WITH MODIFIERS

Types of modifiers, applying modifiers, modifiers stack, instanced modifiers, architectural tools and exercise.

V TYPES OF MODELING

Patch modeling, non-uniform rational B-spline (NURBS) modeling, editable mesh modeling and exercise.

VI MATERIALS AND MAPS

Materials editor, materials editor options, material properties, materials types rollouts in materials editor and exercise.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-101:	**ELEMENTS OF BUSINESS STUDIES**	

I PURPOSE AND STRUCTURE OF BUSINESS

Meaning, definition and objective of business. Range and classification of business activities. Difference between business and other activities. Meaning and functions of commerce. Industry and its types. Trade and its types. Concept of social obligation of business. Responsibilities towards different interest groups. Social values and business ethics. Characteristics of business.

II FORMS OF BUSINESS ENTERPRISES

Meaning and types of business undertakings. Private sector and public sector. Sole proprietorship meaning, feature, merits, limitations and expansion, partnership features, types of partners, formation and registration, partnership deed, merits and limitations. Co-operative form of organization.

III SOURCES OF BUSINESS FINANCE

Nature and significance. Types of business finance and their uses – long term, medium term and short term. Sources of finance. Owner's funds and borrowed funds. Meaning and characteristics of following sources (i) equity and preference shares (ii) debentures and their types. Institutional finance, Retained profits (earning), meaning and characteristics. Public deposits: meaning and characteristics.

IV STOCK EXCHANGES

Meaning and importance. Functions. Names of stock exchange in India; their functions and services. Types of operators – brokers, jobbers bulls and bears. Terms in stock exchange quotations – ex-dividend, cum-dividend, spot delivery, forward delivery.

V INTERNAL AND EXTERNAL TRADE

Internal trade: Meaning and types. Wholesale trade – functions and services, retailers – functions and services. Types of retail organizations (a) itinerants and fixed shops (b) departmental stores, chain stores, mail order house, consumer's co-operative stores (including superbazar). External trade: meaning and importance. Import procedure and export procedure (brief outline). Documents used in foreign trade – indent, letter of credit, bill of lading, charter party.

BOOKS RECOMMENDED:

1. *Elements of Business Studies, by J.N. Maheshwari & S.K. Maheshwari.*
2. *Business Studies, by Dinkar Pagare.*
3. *Principles and Practice of Commerce, by P.N. Bose, Raghvandra Mathur & Abhijit Bose.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-102:	**BUSINESS CORRESPONDENCE & OFFICE COMMUNICATIONS**	

PART A: OFFICE COMMUNICATION

I BASICS OF COMMUNICATION

Meaning of office communication. Principles of communication. Communication process. Factors influencing communication. Verbal and non-verbal communication. Two way personal communication. Barriers to communication. Listening, feed back, openness and counseling.

II OFFICE COMMUNICATION

Role of office as a communication agent. Flow, channels of communication. Formal and informal communication. Timing and presentation factors in communication. Communication in groups and meetings. Communication system.

PART B: BUSINESS CORRESPONDENCE

III ESSENTIAL OF BUSINESS CORRESPONDENCE

Meaning and scope of office correspondence – as vehicle of communication. Structure of business letters, essentials of an effective letter. Personal letters – invitations, replies of invitations, congratulatory letters and telegrams, condolence messages, letters of regret. Applications.

IV OFFICE CORRESPONDENCE-I

Business letters – tenders and quotations, orders for goods. Letters of acceptance and cancellation of orders. Forwarding letters. Letters of complaints. Status references. Drafting of simple advertisements and telegrams. Business circulars. Semi-official letters. Official circulars.

V OFFICE CORRESPONDENCE-II

Office memo, office orders, endorsements and acknowledgements. Orders of appointments, leave transfer and termination of services, rejection of requests. Drafting of office notes and case reports. Issuing notices and agenda of official meetings. Preparation and distribution of minutes.

BOOKS RECOMMENDED:

1. *Principles and Practice of Commercial Correspondence, by James Stephenson.*
2. *Business Communication, by Gordon Lord.*
3. *Effective Business Communication, by M.V. Rodniques.*
4. *Business Communication, by M. Bala Subrahmayam.*
5. *Business Communication, by Homai Pradhan.*
6. *Commercial Correspondence, by Majumdar.*
7. *Commercial Correspondence, by P.K. Ghosh & Y.K. Bhushan.*
8. *Manual of Office Management and Correspondence, by B.N. Tandon.*
9. *Business Studies, by Dinkar Pagare.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-103:	**PRINCIPLES OF ECONOMICS**	

I ECONOMIC PROBLEM, METHODS OF ECONOMIC THEORY AND ALTERNATIVE FORMS OF ECONOMIC ORGANIZATION

Economic problem and Central problem of an economy, Solution of central problem of an economy- Capitalistic, Socialistic and mixed economy. Methods of economic theory - Deductive and inductive method. Concept of production possibility frontier and opportunity cost.

II SECTORAL DEVELOPMENT SINCE INDEPENDENCE

Agricultural development- the food problem. Industrial policy and development of human resource -New industrial policy 1991, Industrial policy resolution 1948, Industrial policy resolution1956. Industrial sickness in India. Investment in Human resource - Education and training, Health and nutrition, Housing and civic amenities

III PRODUCTION COST AND SUPPLY ANALYSIS

Concept of Product-Total Product, Average Product, Marginal Product Production Functions - Types of production function, Law of variable proportion or law of returns, Presentation of three stages in one graph , return to scale . **Cost** - Concept of cost of production - Explicit cost, implicit cost , opportunity cost , real cost controllable and uncontrollable cost. Behavior of cost - Fixed and variable cost**.** **Supply**-meaning. Law of supply, elasticity of supply degree and determinants of elasticity of supply.

IV MARKETS AND DEMAND ANALYSIS

Market- Meaning, Forms of market and their price determination, Equilibrium price and the effect of changes in demand and supply on equilibrium price . Demand- Concept of demand, Law of demand- demand schedule and demand curve ,Elasticity of demand, degree, and determinants of elasticity of demand

V CALCULATION OF DOMESTIC PRODUCTION IN INDIA AND NATIONAL INCOME

Distribution of income in capitalistic economy. Measurement of national income .Concept of Gross Domestic product , Net domestic product and national income . Distinction between Net domestic product at factor cost and net domestic product at market price.

Books Recommended

1. *Introductory Economic theory , by I.C.DHINGRA AND V.K.GARG National income Accounting, by I.C DHINGRA AND V.K GARG*
2. *Evaluation of Indian economy,by Dr Gopalji, Arya book depot,Karol Bagh , New delhi.*
3. *Evaluation of Indian economy,by A.N.Agarwal;Frank Brothers.*
4. *Introductory economic theory by K.P.M Sundaram; R. Chand &Comm.New Delhi.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 75	Total marks – 100	Duration of exam – 3 hrs
WSP-104:	**FINANCIAL ACCOUNTS**	

I INTRODUCTION TO ACCOUNTING

Accounting – Meaning, objectives, basic accounting terms – assets, liability, capital, expenses, income expenditure revenue, debtors, creditors, goods, stock, purchase, sales. Accounting principles – meaning and nature. Process of accounting from recording of business transaction to preparation of trial balance. Classification of accounts, double entry system of book keeping.

II RECORDING OF BUSINESS TRANSACTIONS

Vouchers and transaction – origin of transaction, preparation of accounting vouchers. Accounting equation; approach – meaning and analysis of transaction using accounting equation, rules of debit and credit. Recording of transaction – books of original entry – journal. Books – (i) Cash books – simple, double and triple column cash book, patty cash (ii) Purchase book, sale book, purchase return and sales return book. Ledger – meaning utility, format posting from journal. Bank reconciliation statement – meaning, need preparation.

III TRIAL BALANCE AND RECTIFICATION OF ERRORS

Trial balance – meaning objective preparation. Errors – types of errors, errors affecting and non-affecting trial balance. Detection and rectification of errors (one sided and two sided), use of suspense account.

IV DEPRECIATION PROVISION AND RESERVES

Depreciation – meaning and need for charging depreciation, factors affecting depreciation, methods (straight line method, written down value method). Provisions and reserves – meaning importance and difference between provision reserves. Types of reserves – revenue, general, capital and secret reserves.

V BILLS OF EXCHANGE

Bills of exchange and promissory note: definition, feature, parties, specimen and distinction. Important terms – days of grace, date of maturity, endorsement, discounting, dishonor of bill, noting charges, retirement and renewal of the bill, journal entry and necessary account in the book.

BOOKS RECOMMENDED:

1. *Introductory Economic Theory; NCERT.*
2. *B.L. Gupta (Arya Book Depot).*
3. *I.C. Dhingre; Sultan Chand & Sons.*
4. *Evaluation of Indian Economy, by Dr. Gopalji; Arya Book Depot, Karol Bagh, New Delhi.*
5. *Evaluation of Indian Economy, by A.N. Agarwal; Frank Brothers.*
6. *Introductory Economic Theory, by K.P.M. Sundaram; R. Chand & Comm. New Delhi..*

Periods / week – 04	Total no. of periods reqd. - 100	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-201:	**SECRETARIAL PRACTICE**	

I CORPORATE ORGANIZATION

Company definition, types of companies – public, private and government companies, multinational companies. Difference between public and private company, privileges of private company. Formation of company – procedure and role of promoters. Memorandum of association and articles of association and distinction between the two. Filling of documents and registration. Certificate of incorporation. Prospectus, its nature and importance. Commencement of business.

II SHARE CAPITAL AND MEMBERSHIP

Issue and allotments of shares. Calls on shares, forfeiture of shares. Transfer and transmission of shares. Shares certificate, share warrant and stock. Different types of capital. Membership of the company – acquisition and termination.

III PATTERNS OF COMPANY MANAGEMENT

Secretary – appointment, qualification, functions and positions. Director – appointment, retirement, functions and disqualifications. Chairman – appointment, power and responsibilities.

IV COMPANY CORRESPONDENCE

Company returns, company notices, company circulars, company reporters, financial and statistical returns.

V COMPANY MEETINGS

Annual, general, statutory and board of directors. Rules and procedures of conduct of meetings. Motions and resolutions. Notice, agenda and minutes of company meetings. Office meetings: formal and informal meetings. Arrangements for the meetings. Office Secretary's duties in regard to meetings: (a) before the meeting, (b) during the meeting and (c) after the meeting.

BOOKS RECOMMENDED:

1. *The Text Book of Commerce, by J.N. Sinha.*
2. *Secretarial Practice in India, by Tripathi.*
3. *Company Secretarial Practice, by P.K. Ghosh.*
4. *Secretarial Practice, by M.C. Kuchlal.*

Periods / week – 04	Total no. of periods reqd. - 100	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-202:	**FINANCIAL ACCOUNTS**	

I FINANCIAL ACCOUNT

Trading account – meaning need and preparation. Profit and loss account – meaning need and preparation. Balance sheet – meaning need and preparation. Use of further information for adjustment in preparation of final account (depreciation (b) provision for doubtful debts (c) outstanding expenses (d) prepaid expenses (e) prepaid income (f) broad classification of revenue items (g) closing stock.

II RATIO ANALYSIS: MEANING OBJECTIVE AND COMPUTATION OF RATIO ANALYSIS

Liquidity ratio: current ratio and quick ratio. Solvency ratio: debt equity ratio. Activity ratio: capital, fixed asset, net working capital, stock turnover ratio. Profitability ratio: gross profit, net profit, return of investment, return of equity.

III ACCOUNTING FOR PARTNERSHIP FIRM

Nature of partnership firm, partnership deed (meaning, impact on accounting treatment), special aspects of partnership accounts (a) Fixed vs. fluctuating capital (b) Division of profits among partners.

IV ADMISSION OF A PARTNER

(a) Effects of admission of a partner (b) Change in profit sharing ratio (c) Goodwill – nature and methods of calculation: average profit, super profit, capitalization, accounting treatment. (d) Need for revaluation of asset and liabilities. Requirement of a partner: (a) Change in profit sharing ratio (b) Share of capital (c) Share of goodwill and accumulated profits. Dissolution of partnership firm: (a) Meaning and settlement of accounts – preparation of realization account.

V COMPANY ACCOUNT

Nature of a company, accounting for a share capital (a) Issue and allotment of shares – entries to be past for application allotment and calls (b) Issue at par, at premium, at discount, call in advance, call in arrears (c) Forfeiture and re-issue of forfeited share. Issue of debenture (a) Meaning of debenture (b) Nature of debenture capital (c) Issue of debenture at a par, at a discount and at a premium.

BOOKS RECOMMENDED:

1. *Double Entry Book Keeping, by T.S. Grewal, Sultan Chand & Sons.*
2. *A Text Book of Accountancy, by M/S. Franks Bros. & Co. Pvt. Ltd.*
3. *A Text Book of Accountancy, by M.S. Tata and McGraw Hill.*
4. *Accountancy Book I (NCERT)*
5. *Principles and Practices of Accounting, by M/S. Arya Publishing House, New Delhi.*
6. *Problems in Advanced Accounting, by R.L. Gupta.*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-203:	**BANKING, INSURANCE & TRANSPORT**	

(A) BANKING

I BANKING PRACTICE

Definition of banking. Different types of banks. Commercial bank and their functions. Opening of different type of accounts. Operation of accounts, closing of bank account. Pass book, cheque book and pay-in-slip book. Banker and customers relationship.

II NEGOTIABLE INSTRUMENTS

Definition and characteristics. Bills of exchange, kinds, acceptance, presentation, discounting, dishonour, noting and protesting. Promissory note-cheque. Kinds of cheque. Difference between bill, note and cheque I.O.U.

III PAYMENT OF CHEQUES

Paying banker duty, precautions to be taken by paying banker. Crossing of cheques, its effects and examples. Endorsements of cheques – its effects and examples. Collection, discounting and dishonour of cheques. When the banker must refused payment of cheques. Overdraft and cash credit.

(B) INSURANCE PRACTICE

IV INSURANCE

Fire insurance: function of fire insurance, principles of fire insurance. Procedure of taking out fire policy. Kinds of fire policy. Claims and their settlements. Motor insurance: categories of vehicles. Type of motor insurance policies, policy conditions. Settlement of claim. Main elements of an insurance contract: definition, types of insurance, contracts, principles, kinds. Socio-economic significance of insurance. Life insurance: importance, principles, procedure, kinds of life insurance policy.

V TRANSPORT

Railway, Railway problems in India, development of Railways. Roadways. Urban and rural transport. Advantages of road transport. Problems of road transport.

BOOKS RECOMMENDED:

1. *Theory and Practice of Banking, by Hanumanta Rao A.V.*
2. *A Text of Commerce, by J.C. Sinha.*
3. *Economics of Transport, by S.K. Srivastava.*
4. *Business Studies, by Dinkan Pagare.*
5. *Theory and Practice of Insurance, by Mohd Arif Khan.*

Periods / week – 04	Total no. of periods reqd. - 100	Sessional marks – 25
Exam marks – 100	Total marks – 125	Duration of exam – 3 hrs
WSP-204:	**OFFICE ORGANIZATION & MANAGEMENT**	

I NATURE AND IMPORTANCE OF MANAGEMENT

Meaning and functions of management. Principles and levels of management. Scientific management, principles and techniques. Direction and supervision, leadership, coordination and controlling.

II OFFICE ORGANIZATION

Principles of organization, types of organization – centralization and decentralization of office work – division of work and specialization. Organization charts and manuals. Principal departments of a modern office.

III MARKETING & SALES PROMOTION

Basic concept of marketing and salesmanship. Sales promotion, meaning, need and importance. Methods/Techniques of sales promotion. Advertising – features, functions and significance.

IV UTILITY OF COMPUTER TO OFFICE

Introduction to computers, meaning and features. Components of computers and its management. Role of computers in offices. Types of process in relation to accounting record system such as spread sheet, database, and word processor. Office work. Office machines. Advantages and disadvantages. Types of office machines.

V OFFICE PERSONNEL RELATIONS

Human relations in office management. Employee suggestion system. Staff welfare – working conditions, motivation and handling of grievances. Public relations: meaning and scope of public relations. Role of office assistant in conducting public relations in an organization. Relation with internal public and relations with external public. Principles and techniques of effective public relations (an overview).

BOOKS RECOMMENDED:

1. *Principles and Functions of Management, by Dinkar Pagare.*
2. *Office Management Principles and Practice, by Prasanta K. Ghosh.*
3. *Office Management, by R.K. Chopra.*
4. *Principles and Functions of Management and Administration, by G.P. Gupta.*
5. *Fundamental of Business Organization and Management, by Y.K. Bhushan.*
6. *Practical Public Relation, by Sam Black.*
7. *Labour Problems in Social Welfare, by S.R. Saxena.*
8. *Functional Management – BP Singh & TN Chabra*

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 25
Exam marks – 75	Total marks – 100	Duration of exam – 3 hrs
WSP-205:	**LABOUR LAWS & LABOUR RELATION**	

I LABOUR ECONOMICS AND LABOUR PROBLEMS

Meaning and concepts of labour. Labour economics – definition, nature and importance of labour economics, relation between labour economics and labour problems. Labour welfare: meaning, feature and objectives of labour welfare.

II HUMAN RESOURCE MANAGEMENT

Concept of personnel management. Manpower requirement, recruitment and selection. Employees training and development.

III LABOUR LAWS

Aims of industrial legislation. Salient feature of factory act 1946 (a) Workman's compensation act 1923, (b) Rates of compensation act (revised in 1976). Minimum wages act. Employees provident fund act.

IV LABOUR MANAGEMENT RELATION

Trade union – Rise and growth of trade union movement. Concept of industrial peace, prevention and settlement of disputes.

BOOKS RECOMMENDED:

1. *Economics of labour and industrial relation (Sahitaya publications) by Dr. TN Bhagoliwal.*
2. *Dynamics of Industrial Relation, Himalaya Publishing House.*

Periods / week – 06	Total no. of periods reqd. - 150	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 2 hrs
WSP-191:	**SHORTHAND-I**	

TO ACQUIRE A SPEED OF 60 WORDS PER MINUTE IN ENGLISH SHORTHAND

Consonants and vowels. Intervening vowels and position. Grammalogous. Punctuation. Alternative sings for 'r' and 'h' Diphthongs and Triphones. Abbreviated 'w' phraseography. Tick 'the' 's'; and 'z' left and right motion. Stroke 's' and 'z'. Large circle 'sw' and 'ss' or 'sz' . loops 's' and 'str'. Initial hooks to straight strokes and curves. Alternative forms. For 'fr' ; 'vr' etc. Circles and loops to final hooks. Shun hook. Aspirate; upward and downward 'L' and 'sh' . Compound consonants. Vowel indication. Halving principle, Doubling principle, Diphonic or two vowel sign, medial semi-circle. Prefixes. Suffixes and termination. 110 Exercises of Pitman and Shorthand Instructor.

Periods / week – 06	Total no. of periods reqd. - 150	Duration of exam – 1 hrs
Exam marks – 50	Total marks – 150	Sessional marks – 100
WSP-192:	**COMPUTER TYPING & TEXT PROCESSING-I**	

Keyboard practice on Computer Keyboard using "MS-Word" word-processor program to achieve a speed of 25 words per minute. Typing passages in Indented, Blocked and Hanging Paragraph styles. Typing passages and letters from handwritten manuscripts with proof-reading and correction indications. Typing invitations, programmes, etc., for meetings / functions etc. Typing of simple tables using "Tables" feature of MS-Word

Periods / week – 03	Total no. of periods reqd. - 75	Duration of exam – 1 hrs
Exam marks – 25	Total marks – 75	Sessional marks – 50
WSP-193:	**OFFICE NOTING & REPORTING**	

The practice shall comprise of exercise to be designed for training of the students by the teacher simulating the Noting & Reporting work arising in public and private sector offices. A broad outline of the topics to be dealt with is indicated below:- Noting/Reporting on communication concerning; Non-payment' under- and over-payment of bills. Leaves, appointments, promotions, transfer of personnel. Disciplinary cases against personnel. Scholarship, admissions; removal / renewal of names, disciplinary cases as arising in an educational institution. Replenishment of stocks, theft in stocks, etc. Enquiries of happening of certain events in the organization. Short delivery, excess delivery, non-delivery of goods/materials/supplies. Breakage, repair, fault, etc. in building, machinery equipment/ furniture, etc. Visits, inspections, interviews, etc. Any other relevant topics in the discretion of teacher.

Periods / week – 03	Total no. of periods reqd. - 75	Sessional marks – 60
Exam marks – 40	Total marks – 100	Duration of exam – 3 hrs
WSP-196:	**COMPUTER APPLICATIONS-I**	

M.S Word – introduction of word creation of a new Doc viewing and saving a document, in introduction of tool bass use of keyboard keys. Desktop publishing with word. Working with Text – Editing – Navigation and Block operator formatting – page formality, paragraph format & font format protection and compare document, mail merge, use of drop cap, format painter. Use of Drawing tool bar, working with table simple mathematical work in M.S Word. Final touch – Use of Resume Wizard, use of Watermark working with diagrams. A period report on M.S Word. M.S Excel – Introduction and Basic excel features as Insertion and deletion of Coolum's and Rows. Working with chart. Introduction of formula bar.

Books Recommended

1. M.S office 2000 by Nelson

Periods / week – 05	Total no. of periods reqd. - 125	Sessional marks – 100
Exam marks – 50	Total marks – 150	Duration of exam – 2 hrs
WSP-291:	**SHORTHAND-II**	

To acquire a speed of 100 words per minute in English Stenography. To Practice phrases and contractions from exercises onwards of the pitman and shorthand instructor. Taking dictation of unseen passages and transcript of shorthand notes on the typewriter. To correct mistakes in spelling transcription and typing.

Periods / week – 06	Total no. of periods reqd. - 150	Duration of exam –1 hrs
Exam marks – 50	Total marks – 150	Sessional marks – 100
WSP-292:	**COMPUTER TYPING & TEXT PROCESSING-II**	

Speed-building practice on Computer Keyboard using “MS-Word” word-processor program to achieve a speed of 40 words per minute. Typing simple passages and Bulleted/Numbered passages in Indented, Blocked and Hanging Paragraph styles. Typing passages and letters from handwritten manuscripts with proof-reading and correction indications. Designing Business Letter-Heads and typing business letters in various styles (Blocked, Indented, Semi-Blocked Styles) Typing minutes and agenda of meetings. Typing of multi-column tables, Balance-Sheets, Bills and Invoices, etc. using “Tables” feature of MS-Word.

Periods / week – 03	Total no. of periods reqd. 75	Sessional marks – 50
Exam marks – 25	Total marks – 75	Duration of exam –1 hrs
WSP-293:	**SECRETARIAL FUNCTIONS**	

The practice shall comprise of exercises to be designed for training of students by the teacher on the topics indicated below:

Filling practice. Indexing practice. Receipts and dispatch. Follow up. Forms and proformas generally uses in office. Practical training in handling of office machines. Any other topic / topics in the discretion

Typing passage and acquiring a speed of 25 words per minute’.. Typing from manuscripts. Typing draft letters, hand written and with correction indications in it. Typing invitation, programmes, etc. for meetings / functions etc. typing of simple tables containing single had columns.

Periods / week – 03	Total no. of periods reqd. 75	Sessional marks – 60
Exam marks – 40	Total marks – 100	Duration of exam –3 hrs
WSP-294:	**COMPUTER APPLICATIONS-II**	

M.S Excel: Working with formula – Use of IF and COUNTIF formulas Cell referencing - Relative absolute and mixed refereeing. Advance features - Goal seek Validation, conditional formality protection of sheets,

fetter and Auto fetter. Working with chart Wizard – Different types of chart How to make changes in the exciting chart. Use of pivot table – working on it. Final project report on Excel.
Tally 5.4, 6.3: Introduction Gateway of tally creation of co. Ledger (single Multiple), Accounts, Rules of journalizing. Vouchers – (All six types of Vouchers). Inventory - Stock ledger, Groups, client. Features F11, F12

Periods / week - 03		Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100		Total marks - 125	Duration of exam – 3 hrs
WGT-101:	**COSTUME DESIGN & FABRICATION-I**		

RATIONALE

The objective of this paper is to make students familiar with selection and matching the needle, thread with fabrics, basic stitches and decorative stitches, seams and seam finishes, disposal of fullness in garments.

UNIT-I

Selection and matching the thread and needle with the fabric (i) Basic hand stitches. Temporary stitches: basting-even, uneven, diagonal and slip basting (ii) Permanent stitches: running stitch, hemming, back stitch, over casting, blanket stitch, button hole stitch.

UNIT-II

Technical terms used in clothing construction. Seams and seam finishes: types of seams and their choice. Working of common seams. Plain seam, lapped seam, run and fell seam, French seam, Mantua makers seam, seam finishes. Pinked finish, edge stitched finish, double stitch finish, overcast finish, herring bone stitch finish, bound seam edge finish.

UNIT-III

Designing through disposal of fullness such as Darts, Pleats, Tucks, Gathers. Frills, Ruffles, Flare, Gore, Gusset and Godet.

UNIT-IV

Preparation and use of true bias, facings and bindings. Uses of true bias cutting and joining bias strips. Facing: Bias facing, shaped facing, decorative facing. Binding: Single bias binding, double bias binding. Common neck line finishes.

UNIT-V

Plackets and openings: Standards of a good placket. Inconspicuous plackets. Continuous bound placket, two piece placket, zipper placket. Conspicuous openings and plackets, shirt sleeve placket, bound neck opening, center front opening, box pleat style. Fasteners: Button and button holes, press buttons, hooks and eyes, Velcro etc.

BOOKS RECOMMENDED:

1. *Mc Call's Sewing in Colour, Hamlyn, London, New York.*
2. *Odhams Encyclopaedia of Needlecraft, Dorothy M. Eawlett, Hazel M. Thoma, Constance Howard, J. Petherbridge, Odhan's Press Ltd., London..*
3. *Basic Process of Clothing Construction, Prof. Dongaji.*
4. *Creative Clothing Construction, Allyne Bawe, McGraw Hill Book Company.*

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-102:	**DRAFTING AND PATTERN LAYOUT-I**	

RATIONALE

The objective of this paper is to acquaint the correct use of equipments, designing and drafting, draping cloth into styles, pattern making for individual and commercial designing.

UNIT-I

(i) Elementary anatomy as applied to dress making. Normal and abnormal figure. Human body, its growth and development, theory of eight heads, height and girth factors (ii) Measurements, method of taking body measurements and their order of recording. Study of measurement chart and human proportions. Standardization of measurements.

UNIT-II

(i) Correct use and use of cutting to stitching equipments (ii) Importance of pattern making and types of patterns placing, marking and cutting. Preparation of fabric before cutting.

UNIT-III

(i) Drafting of child's bodies block and its adaptation (ii) Drafting of ladies bodies block and its adaptation.

UNIT-IV

Drafting of the following garments in scale and current fashion. Jhabla, Baba suit, Romper, frocks, and combination suits for boys and girls.

UNIT-V

Drafting of the following garments in scale and current fashion. Various types of petticoats. Types of chooridar, Aligarh cut and broad pyjamas. Types of shalwar, ladies shirts, blouse and house coat.

BOOKS RECOMMENDED:

1) *Basic processes and clothing construction – Sheric Doongaji..*
2) *Basic book of sewing – Harlow Eve.*
3) *Easy cutting – Jurekar M.B..*
4) *Commercial system of cutting – Jurekar M.B..*
5) *Making and Designing clothes – Miles and Cicile.*
6) *Manual of children's clothing – Savitiri Pandit.*
7) *Making your children clothes – Newton Abbot, David and Charles.*

Periods / week - 02	Total no. of periods reqd. - 50	Sessional marks - 20
Exam marks - 80	Total marks - 100	Duration of exam – 3 hrs
WGT-103:	**TEXTILE MANUFACTURING**	

UNIT-I INTRODUCTION TO TEXTILE

Industry, markets, classification of textile fibers and essential fiber properties.

UNIT-II YARN FORMATION

(i) Elementary process of different types of fibers to yarn. Cellulose. Protein. Synthetic. (ii) Twist and ply of yarns and (iii) Types of yarns, simple and fancy yarns.

UNIT-III FABRIC CONSTRUCTION

Weaving structure of simple loom and its working method. Types of weave, basic and fancy – plain, twill, satin, crepe, leno and pile. Elementary knowledge of knitting, felting bonding and brading.

UNIT-IV ORIGIN AND PROPERTIES OF NATURAL FIBERS & MANDE FIBERS

Wool. Silk. Cotton. Linen. Rayon. Polyster. Nylon.

BOOKS RECOMMENDED:

3. *Grammar of Textile Design – H. Nishbal – Tarapore Wak; McGraw Hill.*
4. *Surface Characteristics of Fibres & Textiles – M.J. Schick; Marul Dekker Jac Ny.*
5. *Fundamental of Textile and their care – Sushila Dantyagi, Orient Longman, New Delhi.*
6. *Textile Fibre to Fabric, by Bernard P. Corbman; McGraw Hill Book Company, New Delhi.*
7. *Household textile and laundry work – Durga Deulkar.*

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs

WGT-104:	**FASHION ART & DRAWING**

UNIT-I COLOR THEORY

Fundamentals of colour, Classification of colour, warm colour, cool colour, colour psychology. Colour harmonies, their use and importance in dress. Colour terminology – Hue, value, intensity. Tones, tints and shades.

UNIT-II ELEMENTS AND PRINCIPLES OF DRESS DESIGN

Elements of dress design – line, form, colour and texture. Effect of line on dress, effect of colour on dress and effect of texture on dress.

UNIT-III PRINCIPLES OF DRESS DESIGN

Proportion balance – formal, informal & radial, rhythm – uniform and diminishing, emphasis and harmony.

UNIT-IV FASHION DESIGN AND DESIGNERS

Basics of fashion design, terminology of fashion design – style, design, taste, classic, fad, acceptance, fashion cycling, designer's role and their types.

UNIT-V ART MATERIALS, EQUIPMENTS AND MEDIUMS

Introduction of materials and their use: Drawing and designing equipments. Different mediums of painting – Water colour, poster colour, water proof ink.

BOOKS RECOMMENDED:

1. Art in Everyday Life by Hariet Gold Stein, Vedda Gold Stein.
2. Individuality in clothing selection and personal appearance by Mary Kefgen & Phyllis Touchie-Specht.
3. Design through discovery by Marjorie Elliott Beklin..

Periods / week - 02	Total no. of periods reqd. - 50	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-201:	**COSTUME DESIGN & FABRICATION-II**	

RATIONALE

The objective of this paper is to familiarize the students to select the fabric for various purposes, to prepare properly designed garments with perfect fitting.

UNIT-I

Types of sewing machines: Parts of a machine and their functions, minor defects and their remedies. Sewing machine attachments.

UNIT-II

Selection of fabrics for various purposes: Age, climate, occasion, profession and fashion.

UNIT-III

Fitting problems and solution. Alteration on commercial pattern. Inspection and checking of fabrication.

UNIT-IV

Mending fundamental rules for darning. Kinds of tears. Pressing: Equipments, pressing method, the final pressing.

UNIT-V

Prospects of garments industry. Importance and short comings of readymade garments.

BOOKS RECOMMENDED:

1) *Basic process and clothing construction – Sherie Doogaji & Raushri Deshpande.*
2) *A.B.C. of sewing – Ciceley Penton.*
3) *Making a dress – Ira Lillow.*
4) *Clothing care – A.J. Ernest Mass.*
5) *The basic book of sewing – Eve Harlow.*
6) *Individuality in clothing selection and personal appearance – Mary Kelgen & Specht.*
7) *Clothing for moderns – Eras'n Kinchen Peters*
8) *Creative clothing construction - Allyne Bane.*

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-202:	**DRAFTING & PATTERN LAYOUT-II**	

RATIONALE

The objective of this paper is to acquaint and expertise the students in designing and drafting of dresses in different styles and fashions for commercial and individual purpose.

UNIT-I

Reading of pattern from a fashion book and the methods of its transfer to paper pattern.

UNIT-II

Use of dress form for draping cloth into styles and for making patterns. Creative styles through Dart Manipulation and torso foundation. Creating variety in yoke design, decorative seams and Asymmetrical design designing.

UNIT-III

Drafting, pattern cutting and layout of the following design. Details: Collars:- Partial roll, scalloped, puritan, sailor, square, rippled, flared, full roll, two-piece shirt, shawl, application of collars. Sleeves:- Plain, puff, bell, bishop, circular, leg-o-mutton, raglan, kimono dolman Magyar. Pocket:- Patch pocket, bound pocket, side pocket, front pocket, welt pocket, flap pocket. Cuffs:- various kinds.

UNIT-IV

Drafting and designing of the following garments in scale and current fashion. Shorts, pants, bush-shirt, full sleeve shirt.

UNIT-V

Drafting of the following garments in scale and current fashion, types of pyjama, Bengali kurta, kalidar kurta, waist coat for ladies and gents, nighty.

BOOKS RECOMMENDED:

1) *Basic process and clothing construction – Sherie Doogaji & Raushri Deshpande.*
2) *A.B.C. of sewing – Ciceley Penton.*
3) *Making a dress – Ira Lillow.*
4) *Clothing care – A.J. Ernest Mass.*
5) *The basic book of sewing – Eve Harlow.*
6) *Rahual Jewell*
7) *Skatch Book on Drafting*
8) *Drafting Book of Hellon Joseph*

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-203:	**BUSINESS ORGANIZATION & ENTREPRENEURSHIP DEVELOPMENT**	

RATIONALE

The objective of this paper is to make the students familiar with Entrepreneurship development, small scale industries, financial management, marketing techniques, industrial management, banking and postal information etc.

I INTRODUCTION

Entrepreneur, entrepreneurship & its importance, qualities of an entrepreneur, entrepreneur motivation training, achievement planning. Small scale industries – role and importance of small scale industries, village industry, tiny industry, small scale and ancillary industry. General principles of organization and management nature, types and functions.

II FINANCIAL MANAGEMENT

Estimating and costing, financial institutions for land, infrastructure, machinery and raw materials.

III MARKETING TECHNIQUES

Project selection based on market survey, demand and supply estimation product life style. Basic concept of marketing and salesmanship.

IV INDUSTRIAL MANAGEMENT

General cleanliness and supervision, preparing salaries and wage bills, proper stores, studying purchase requirements, maintenance of stock and stock books, receipt and issue of stock. Working capital management, personnel management, book keeping, balance sheet, brake even analysis. Project identification, analysis of report writing.

V BANKING

Cheaques, credit note, debit note, promissory note, draft, invoice, voucher and other commercial documents. Postal information.

BOOKS RECOMMENDED:

1) *Environment and entrepreneur – Arvindrai N. Desia*
2) *Entrepreneurship and small business management – Dr. C.B. Gupta and Dr. S.S. Khanka.*
3) *Business environment and entrepreneurship – U.C. Patnaik and S.R. Patnaik.*

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-204:	**INDIAN ETHNIC COSTUME & TEXTILE**	

UNIT-I

Evolution of dress, decorative, protective and utility value of dress.

UNIT-II

Role of fashion, factors which influence fashion. Current style and fashion.

UNIT-III

(i) Traditional textiles of India. Muslin, Daccasaris, Chanderisari, Baluchar-Buttedar, Brocade, Bafta, Ab-I-rawans, Himrus & Amrus, Paithani and Pitambar, Patola, Bandhini, Kalanndar. (ii) Traditional embroideries of India – Phulkari of Punjab, Kasuti in Karnataka, Kanthas of Bengal, Chickenkari of Lucknow, Kashmiri Kashida.

UNIT-IV

Indian costumes: Variety and diversity. Contemporary scene. (I) Northern and Western region. Contemporary scene. (II) Eastern region. Contemporary scene. (III) Southern region.

UNIT-V

(i) History of Indian costume, Ancient, Mughal period, Rajput and Victorian period. (ii) Dance costumes: Traditional and folk.

BOOKS RECOMMENDED:

1) *Indian costumes – A. Biswas.*
2) *Indian costumes – G.S. Ghurye.*
3) *The theory of fashion design – Brockman.*
4) *Indian Costumes and Textiles – Dr. Parul Bhatnagar*

Periods / week - 02	Total no. of periods reqd. - 50	Sessional marks - 25
Exam marks - 100	Total marks - 125	Duration of exam – 3 hrs
WGT-205:	**TEXTILE DYEING & PRINTING**	

I FINISHING PROCESS OF FABRICS (ELEMENTARY)

Importance of fabric processing. Bleaching. Mercerizing. Shrinking. Tentering. Calendaring. Napping. Beetling. Crepe and crinkled effects,

II DYEING

Classification: Natural dyes: Vegetable. Animal. Mineral. Synthetic dyes: Basic dyes. Acid dyes. Sulphur dyes. Vat dyes. Disperse dyes.

III PRINTING

Tie and dye. Block printing. Batik printing. Screen-printing.

IV CARE OF FABRICS

Fabric care. Storing. Stain removal.

BOOKS RECOMMENDED:

4. *Grammar of Textile Design – H. Nishbal – Tarapore Wak; McGraw Hill.*
5. *Surface Characteristics of Fibres & Textiles – M.J. Schick; Marul Dekker Jac Ny.*
6. *Fundamental of Textile and their care – Suchila Dantyagi, Orient Longman, New Delhi.*
7. *Textiles fiber to fabric – Bernard P. Corbman; McGraw Hill.*
8. *Household Textiles & Laundry Work.*

Periods / week - 07	Total no. of periods reqd. - 175	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 5 hrs
WGT-191:	**COSTUME DESIGN FABRICATION & PRODUCTION EQUIPMENT**	

1. Demonstration of basic stitches and decorative stitches listed under Unit-I (WGT-101).
2. Demonstration of different types of seams and seam finishes.
3. Demonstration of various methods of disposing fullness in garments.
4. Demonstration of various kinds of bias finishing, plackets, opening and fasteners.
5. Fabrication of various types of garments listed under paper (WGT-102).

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 3 hrs
WGT-192:	**DRAFTING & PATTERN LAYOUT-I**	

1. Exercise on observation of different types of bodies.
2. Practice and taking measurements directly from body.
3. Practice on drafting, layout and estimation of garments listed under theory Unit-IV of drafting and pattern layout.
4. Practice on drafting, layout and estimation of garments listed under Unit-V of drafting and pattern layout.

Periods / week - 04	Total no. of periods reqd. - 100	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 4 hrs
WGT-193:	**EMBROIDERY**	

1. Introduction to different fabrics, threads and equipments used in embroidery.
2. Learning and practicing of the hand embroidery stitches on sample: Basic and variations, back stitch, button hole stitch, blanket stitch, bullion knot, cable chain stitch, chain stitch, chequered chain stitch, Chevron stitch, couching, cross stitch, darning, eyelet hole stitch, feather stitch, fish bone stitch, fly stitch, French knot, hem stitch, herring bone stitch, holbein stitch, long and short stitch, over casting stitch, running stitch, Rumanian stitch, satin stitch, sedding stitch, stem stitch, double knot stitch, lazy daizy stitch, joha stitch, kamdoni, salma sitara and pisauri bhounri.
3. Preparing samples of types of emoridery and traditional Indian embroideries. Applique Assisi, cut work, drawn fabric work, net emboirdery, shadow embroidery, smocking, honeycomb, sindhi work, kashmeri embroidery, kantha of West Bengal, kasuti of Karnataka, chicken kari of U.P. phulkari of Punjab.
4. Building up and designing stitchary borders, repeat borders, corners, circles , squares etc,

Books Recommended

1. The craft of embroidery – Alison Liley.
2. Indina embroidery – Kamla Devi Kasuti
3. Needle work in colour – Macalls (edges)
4. Embroidery and stitch book – Penelope
5. Crewel embroidery – F. Anderson

Periods / week - 04	Total no. of periods reqd. - 100	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 3 hrs

WGT-194:	**FASHION ART & DRAWING-I**

Objectives: To make students aware of:

Art materials and tools. Understand colour theory and its application. Understand the nature through line, form, colour, texture, balance and harmony in design. Optical illusion created by lines and other geometrical shapes. Drawing and sketches of realistic and fashion figures.

PART-A: Exercise on colour and design

Colour mixing, colour chart, tonal scale, tints and shades. Munsell system, Ostwalled system nature sketches. Optical illusion created by lines and colour. Different placement of textile design based on nature, method of making motif, transfer and tracing of motif / unit. Textile design – Geometrical, floral, traditional , imaginative, folk designs – at least 50 sheets.

PART-B: Exercise on human figures

Prepare block figure of male, female and kids. Study of human figures according to standard fashion measurements in different postures. Sketching and drawing in different medium. Figure drawing with textile, fashion styles and cuts.

Students have to submit a project consisting Part A and B.

BOOKS RECOMMENDED:

1. Art in Everyday Life by Hariet Gold Stein, Vedda Gold Stein.
2. Individuality in clothing selection & personal appearance by Mary Kefgen & Phyllis Touchie- Specht.
3. Design through discovery by Marjorie Elliott Beklin..

Periods / week - 04	Total no. of periods reqd. - 100	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 3 hrs
WGT-195:	**COMPUTER APPLICATIONS-I**	

UNIT-I FUNDAMENTALS OF COMPUTER, MULTIMEDIA AND INTERNET

Basic of computers. Basic of Windows 2000 operating system. Introduction to multimedia and all about internet.

UNIT-II CONCEPTS OF GRAPHICS

Drawing, all about colour, typography, laws of design, resolution, graphic image file formats, managing graphic images, graphics for the web, visualization basics..

UNIT-III WORKING WITH AUTOCAD

Introduction to AutoCAD. Drafting in AutoCAD: Bodies block of children and ladies, Adaptation of bodies blocks, Collars and sleeves.

UNIT-IV WORKING WITH COREL DRAW

Drawing and coloring, mastering with text, applying effect, working with bitmap commands, corel draws web resources.

UNIT-V PROJECT

Periods / week - 07	Total no. of periods reqd. - 175	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 5 hrs
WGT-291:	**COSTUME DESIGN & FABRICATION-II**	

1. Demonstration of fitting problem and solutions. Demonstration of alteration.
2. Demonstration of pressing on various fabrics.
3. Practice on fabrication of different types listed under Unit II and Unit III.
4. Practice on fabrication of different types of dress listed under Unit-IV of Drafting and Pattern Layout.
5. Practice on fabrication of different types of dress listed under Unit-V of Drafting and Pattern Layout.

Periods / week - 03	Total no. of periods reqd. - 75	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 5 hrs
WGT-292:	**DRAFTING AND PATTERN LAYOUT-II**	

1. Practice on reading fashion book and transfer the design into pattern.
2. Practice on making patterns by drafting and by draping fabric on dress form or model.
3. Practice on drafting and layout of sleeves, collars, pockets and cuffs.
4. Practice on drafting, layout and estimation of garments listed under Unit-IV of Drafting and Pattern Layout.
5. Practice on drafting, layout and estimation of garments listed under Unit-V of Drafting and Pattern Layout.

Periods / week - 04	Total no. of periods reqd. 100	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 4 hrs
WGT-293:	**MACHINE EMBROIDERY**	

1. Demonstration of embroidery machines. Preparation before starting the machine embroidery, setting the machine, correct position and posture for working on machines.
2. Practice on selecting of appropriate needles, threads, fabrics, design, colour, schemes for particular articles.
3. Basic stitches used in machine embroidery, its characteristics and working methods. Running stitch, round stitch, cording, needle work, patch work, net work, cut work, eye let stitch, button hole stitch, satin stitch, long and short stitch, French knot.
4. Knit, pearl, cast on, cast off, garter stitch, sticking stitch, ribs, patterns

Periods / week - 04	Total no. of periods reqd. - 100	Sessional marks - 100
Exam marks - 50	Total marks - 150	Duration of exam – 3 hrs
WGT-294:	**FASHION ART & DRAWING-II**	

Objectives: To make students aware of – Illustration of fashion figures and attires in different colour mediums – Poster colour, water colour, ink, sketch pen, dry colour.

PART-A

Illustration of fashion figures to the scale in different postures – At least 10 different poses. Different types of textures and its use in illustrating different fashion garments: Blowing, Marble, metallic, animal print, fur, wrinkled, Chiffon, Leather, Net, etc. – At least 10 latest fashion fabrics. Different types of prints and their effect when draped as dress: Striped, check, geometrical, floral etc. Illustration of garments to the scale for male, female and kids, using fabric of paper – At least 5 sheets.

PART-B

Adaptation of basic designs. Source of inspiration. Using different colour schemes for different seasons. Prepare casual wear, party wear, wedding wear, Indian and western costumes. Prepare Hi fashion attires – At least 5 sheets. Prepare the project and portfolio consisting at least 30 sheets of ¼ imperial size.

BOOKS RECOMMENDED:

1. Art in Everyday Life by Hariet Gold Stein, Vedda Gold Stein.
2. Individuality in clothing selection & personal appearance by Mary Kefgen & Phyllis Touchie-Specht.
3. Design through discovery by Marjorie Elliott Beklin..

Periods / week – 01 (2 Alt. Week)	Total no. of periods reqd. - 25	Sessional marks - 50
Exam marks - 25	Total marks - 75	Duration of exam – 3 hrs
WGT-295:	**TEXTILE DYEING & PRINTING**	

1. Fabric familiarization through market survey.
2. Prepare samples in dyeing and printing listed under Unit-II and Unit-III of WGT-205.
3. To visit clothing manufacturing and printing factories and prepare a report.

Periods / week - 04	Total no. of periods reqd. - 100	Sessional marks - 75
Exam marks - 50	Total marks - 125	Duration of exam – 3 hrs

WGT-297:	COMPUTER APPLICATIONS-II

1. Creating 12.5 inch stick figure. Creating features and shaped figures. Draping traditional Indian dress with accessories on fashion figure.
2. Working with text. Logo designing (Monogram or Trademark of any company). Creating fashion magazine cover.
3. Images in Photoshop and image ready. Working with layers, creating shapes and painting, transforming and retouching.
4. Color and tonal adjustment, filters and their special FX, working with type.
5. Designing fashion ads. Project: Containing 10 sheets.