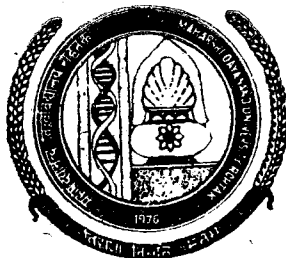8

Maharshi Dayanand University
Rohtak

Syllabus and Courses of Reading for
Bachelor of Technology (B. Tech.)
(Computer Engineering)
Examination

Session—1998-99

B.TECH COMPUTER ENGG.
1998-99
SCHEME OF STUDIES
FIRST SEMESTER

SUBJECTS

Index No.	Theory Papers	Hours Per Week
MA101	Mathematics-I	3
CH103	Chemistry-I	3
•PH105	Physics-I	3
	OR	
ME109	Workshop Technology	
SS107	English	3
EN109	Instrumentation & Electronics	3
CS111	Computer Concepts & Programming	3
		18

PRACTICALS

EN113	Workshopo Practice	6
CS115	Software Lab-I	8
	Applied Physics Practical	2
		34

SECOND SEMESTER

MA102	Mathematics-II	3
CH104	Chemistry-II	3
	OR	
ME110	Industrial Chemistry	
PH106	Physics-II	3
EN108	Applied Mechanics	3
CS110	Problem Solving & Computer Programming-I	3
SS112	Industrial Economics & Labour Laws	3
		18

PRACTICALS

EN114	Mechanical Workshop	4
CS116	Software Lab-II	6
PH118	Applied Physics Practical	2
EN120	Engineering Graphics	4
		34

Note : The allocation of Teaching hours will remain same for theory subjects. However, practical hours may be adjusted subject to minimum of the time allotted in the scheme.

B.TECH COMPUTER ENGG.
SCHEME OF EXAMINATION
SUBJECTS   FIRST SEMESTER

Index Theory Papers No.	No. of Papers	Time Hours	Marks of paper	Marks of C/work	Total Marks
MA101 Mathematics-I	1	3	100	50	150
CH103 Chemistry-I	1	3	100	50	150
PH105 Physics-I OR	1	3	100	50	150
ME109 Workshop Technology					
SS107 English	1	3	100	50	150
EN109 Instrumentation & Electronics	1	3	100	50	150
CS111 Computer Concepts & Programming	1	3	100	50	150
PRACTICALS					
EN113 Workshop Practice	1	4	75	75	150
CS115 Software Lab-I	1	4	75	75	150
SECOND SEMESTER					
THEORY					
MA102 Mathematics-II	1	3	100	50	150
CH104 Chemistry-II OR	1	3	100	50	150
ME110 Industrial Chemistry					
PH106 Physics-II	1	3	100	50	150
EN108 Applied Mechanics	1	3	100	50	150
CS112 Problem Solving & Computer Programming-I	1	3	100	50	150
SS112 Industrial Economics & Labour Laws	1	3	100	50	150
PRACTICALS					
EN114 Mechanical Workshop	1	4	75	75	150
CS116 Software Lab-II	1	4	75	75	150
PH118 Applied Physics Practical	1	4	100	50	150
EN120 Engineering Graphics	1	3	75	75	150

FIRST SEMESTER

MA 101 Mathematics-I (3) 150

To learn mathematical science which forms the basis of the design and principle of construction of many testing and control instruments, techniques and methods of evaluation of data and for understanding the principles of computing.

Course Content :

Differential Calculus : Expansion of function (only Taylor's infinite series), Tangent, Normal and Radius of curvature, Envelope, Asymptotes, partial differentiation, maxima and minima of functions of two or more variables.

Integral Calculus : Double and Tripple integrals, change of order of integration, change of variables. Application to areas. Gamma and Beta function.

Differential Equation : Ordinary differential equations of first order but not first degree, Linear differential equation with constant co-efficients. Euler-Cauchy equation, Method of variation of parameters for second order differential equation. Equations of the form $(d^2y/dx^2) = f(y)$. Simple application and solution of differential equation in series.

Reading List

Title	Author
Text book on Differential Calculus	Gorakh Prasad
Text Book on Integral Calculus	Gorakh Prasad
Integral Calculus	Ray & Seth
Differential Equations	Frank Ayres

CH 103 Chemistry-I (3) 150

pH & Buffer Solution: Hydrogen Ion concentration and its determination by using - Hydrogen, Glass and Quinhydrone Electrodes. Determination of pH of an unknown solution of acids

or bases. Preparation. properties and uses of Buffer solutions. Importance of pH, & Buffer solutions.

Water Treatment : Impurities in natural water, Hardness of water. Degree of hardness & its measurement. Various common methods for removal of hardness of water.

Colloids : Colloidal state, types of colloids, Sols: Definition, types, Preparation. purification, properties, origin of charge, coagulation and protective action. Application of colloids. Emulsions : Definitions, types, preparation and properties.

Corrosion : Theory of corrosion, factors influencing the rate of corrosion, control by metalic coating, cathodic protection and corrosion inhibitors.

Oxidation - Reduction : Definition, Oxidising & reducing agents : peroxide, chloride, hydro sulphite, sulphite, potassium permanganate. Balancing of Redox reaction by Oxidation number method, ion Electron Method.

Chemical Bonding : Introduction, molecular approach to covalent bonds, formation, comparison between V.B. and M.O. theories. Polarity of covalent bonds., Ionic bond, Metalic bonding, hydrogen bonding; reasonance etc.

Introduction to Environmental Pollution : Definition type and source of air and water pollution. Some common methods to minimise pollution in air and effluent from Industries, Introduction of Biological Oxygen Demand (B.O.D.) & Chemical Oxygen Demand (C.O.D.) Hygienic requirement of water.

Reading List

Title	Author
Text book on Inorganic Chemistry	PL Soni
Engineering Chemistry	PC Jain & Monika Jain
Principles of Physical Chemistry	BK Sharma
Air Pollution	BK Sharma

PH 105 Physics-I   (3) 150

To teach the basic principles of physics which form the basis of construction, operation and application of various instruments used in textile manufacturing processes and in testing and control instruments, viz microscope, X-rays, electron microscopes, vibroscope, strain gauge, transducers, etc.

Course Content

Introduction to Laser and Maser : Basic principles of Laser & Maser. Threshold conditions and pumping. Population inversion, He-Ne & Ruby Lasers (principle construction and working). Semiconductor Lasers-main features and conditions of laser action. Uses of lasers and limitations.

Electrical Resistance & Dielectric property of Textile fibres. Static electricity & Antistatic agents in Textiles.

Elasticity : Fundamentals of elasticity. Work done per unit volume in strain. Concept of Poisson's ratio. Resilience of elastic body. Ductile and brittle bodies and their elastic behaviour. Elastic constants. Twisting couple on a cylinder. Longitudinal strain in filaments. Bending moment and its magnitude. Cantilever (neglecting the weight of beam), Depression of beam loaded at the centre. Determination of 'Y' by bending of beam.

Viscosity : Fundamentals of viscosity. Fugitive elasticity. Poiseuille's equation for flow of liquid through cappilary. Motion in a viscous medium. Stoke's law and determination of coeff. of viscosity.

Diffusion & Osmosis : Fick's law of diffusion, relation between time of diffusion and length of column. Osmotic pressure. Semi permeable membrane and dialysis. Berakeley & Hartely method for measuring osmotic pressure. Laws of osmotic pressure-effusion (transpiration and transfusion). Isotonic solutions. Osmosis and vapour pressure. Influence of temperature on osmosis.

Simple Harmonic Motion (SHM) : Differential equation of SHM. Energy of a particle executing SHM.

Reading List

Title	Author
Physical Properties of Textile Fibres	WE Morton & JWS Hearle
Physics Vol I & II	Resruck & Holliday
Properties of Matter	DS Mathur
Basics of Physics Vol II	C Ram Singla

ME 109 Workshop Technology   (3) 150

1.   Introduction :
Workshop processes (names only), safety in industry - need - safety programmes, safety instructions and training, safety consciousness, accidents - causes and types of accidents, accident prevention, personal protective devices and first-aid.

2.   Materials :
Metals, their characteristics, ferrous metals, cast irons, plain carbons steels and alloy steels, their composition and uses, copper and its alloys, aluminium and its alloys, their composition and use.

3.   Foundry :
Steps involved in making a casting, pattern - its functions, types and materials, moulding processes like green sand moulding and dry sand moulding, hand moulding tools.

4.   Welding :
Classification of welding processes, Gas welding processes and equipment required (in brief), shielded Metal Arc welding (SMAW) process and equipment required, Welding joints and welding defects.

5.   Bench work and fittings :
Common tools like vices, files, hammers, chisels, taps, dies, hacksaws, screw drivers and drills, marking tools and measuring tools (in brief).

6.   Carpentary :
Structure of wood, types of Indian timber, seasoning of timber, carpentary hand tools (in brief), carpentary joints.

7.   Smithy :

Forgeable materials and forging temperatures, hand forging tools, smith forging operations and furnaces (in brief).

8.   Sheet Metal :

Metals used in sheet metal work, sheet metal tools, sheet metal operations, sheet metal joints.

9.   Lathe :

Types of lathes, size of a lathe, work holding devices, lathe operations, lathe cutting tools, tool geometry, cutting speed, feed and depth of cut.

10.   Drilling Machine :

Elements of drilling machine, types of drills and drilling machines, operations performed on drilling machines, types of drills, twist drill geometry, drill cutting speed, feed and depth of cut.

Reading List

Title	**Author**
Workshop Technology	OP Khanna
Workshop Technology	Hazara Chaudhary
Workshop Technology	Chapman
Workshop Technology	Koeingsberger
Manufacturing Processes	Begman

SS 107 General English   (3) 150

A course in written English designed to improve student's skill in the use of language. Since this course is meant for the students who have already studied the fundamental principles of languages, its primary aim will be an extension of the student's range of comprehension and an improvement in their expression. The course will include the following:

Comprehension (Reading a passage for comprehension so as to be able to answer questions based on it).

Precis writing (Summarising a passage and assigning a suitable heading).

Business correspondence : Principles of correspondence Planning a letter. Quotations, Orders and Tenders, Sales Letters. Claim and Adjustment Letters, Applications.

Grammar and Usage : Use of Articles, use/of prepositions. Agreement of verb and subject, tenses in conditional sentences, Correct and incorrect sentences.

Gaining precision in the use of words, words often confused because of similarity in meaning, pronunciation or spelling.

Report writing : Types of Reports, Structure of Reports, use of illustrations and writing of Reports. Oral presentation of reports and taking part in meetings, discussions and conferences.

Scheme of the Question paper :

The question paper may, ordinarily contain ten questions out of which students may be asked to attempt any five. The questions will provide internal choice also. In questions pertaining to Grammar and usage, students may be asked to use words in their own sentences, correct some incorrect sentences, fill in blanks, complete some incomplete sentences or rewrite sentences with desired changes.

Reading List

Title	Author
Business Correspondence & Report Writing	RC Sharma & Krishna Mohan
Glimpses of Gen. English	Surjeet

EN 109 Instrumentation & Electronics   (3) 150

Semiconductor Diodes : P-N Junction diode, biasing of P-N Junction diode, V-I Characteristics of PN Junction diode, DC or static resistance, AC or dynamic resistance, temperature effects, diode ohm meter check. Zener schottky, varactor, power, tunnel, photo and light emitting diodes.

Applications of diode in half wave, full wave and bridge rectifiers, power supply and regulated power supply.

Transistors : Junction transistor structure. working of transistor, transistor amplifying action. three configurations. transistor characteristics, construction of transistor, transistor data sheet, biasing of transistor (different biasing circuits), general description of FET, characteristics of JFET.

Oscillators : Introduction, types of oscillators, fundamental principle of oscillation, concept of feedback oscillation, different oscillators (e.g. Hartley, Colpit, Phase shift, weinbridge, tuned collector, etc.).

Operational Amplifier : Op-amp, characteristics of Op-amp, some applications of Op-amp (e.g. inverting amplifier, scale changer, phase shifter, non inverting amplifier, summing amplifier or adder, Integrator, differentiator, voltage to current converter, current to voltage converter, differential amplifier and non-inverting summing).

Transducers : Introduction, Classification of transducers, measurement of linear displacement, measurement of pressure, construction of LVDT, measurement of temperature by using thermo-couple and thermistor, construction of thermo couple and thermistor.

Electronic Instrumentation : CRO, VTVM, Multimeter, Signal Generator, Strain gauge.

Reading List

Title	Author
Elecronic Devices and Circuits	Motorshead
Electronic Devices and Circuits	Millman & Halkies
Electronics Instrumentation & Measurement Techniques	WD Cooker
Electrical & Electronic Measurements & Instrumentation	AK Sawhney

CS 111 Computer Concepts and Programming (3) 150

Modern Computer Systems, Computer types and their origin, Computer elements and operation. PMS and structured notation of Computer. Data Information, Data types and data representation, Number systems, flow-charts and Algorithms, Operations (arithmetic and logic).

Input/output devices, media, methods and uses. Boolean algebra. Logic gates and Truth tables. Logic circuits of Half adder, Full adder, Encoder and Decoder. Operating Systems (purpose and facilities).

Basic features of FORTRAN (Formula translation) programming.

Reading List

Title	Author
Computer Studies	CS French
Introductory Computer Science	Jaggi & Jain
FORTRAN 77	RK Jain
Understanding FORTRAN 77 with structured problem Solving	Michel Billot

EN 113 Workshop Practice (6) 150

Introduction and use of simple hand tools and measuring instruments. The care and maintenance of tools and equipment and the safety regulation pertaining to workshop activities.

Execution of simple process exercises in a step by step sequence of basic processes, vis. marking filing, driling, tapering, threading and simple machining.

Selection of tools and their grain influence of joint methods, making of different types of joints. Pattern allowance. Making a single piece pattern.

CS 111 Programming Exercises (4) 150

To prepare various programmes in FORTRAN related to course CS 111 and run them on the Computer System.

SECOND SEMESTER

MA 102 Mathematics-II   (3) 150

Vector & Tensor : Vector differentiation, Gradient, Divergence and Curl. Use of general orthogonal curvilinear systems, Tensors-addition, multiplication and contraction-differentiation tensors.

Matrices : Rank of Matrix, consistency of linear equations, Eigen-values and Eigen-vectors of matrix, Cayley-Hamilton theorem, Orthogonal, Hermitian, Skew-Hermitian and Unitary Matrices.

Laplace Transformation : Definition of Laplace Transform, Laplace transform of some elementary functions. Some important properties of Laplace Transforms. Application to ordinary differential equation.

Numerical Analysis : Finite Differences. Linear interpolation (only Newton forward and Backward and Langrange's interpolation), Numerical Integration (Simpson's & Trapezoidal rule).

Complex Variable : Functions of a complex variable. Differentiation. Analytic functions. Cauchy-Reimann equations.

Reading List

Title	Author
Matrices	AR Vashishtha
Vector Analysis and an introduction to Tensor Analysis	Murray R Spiegel
Matrices	Frank Ayres
Laplace Transforms	MR Spiegel
Numerical Analysis	Freancis Schied
Text Book of Matrices	Shanti Narayan
Advanced Engineering Mathematics	Erwin Kreyszig

CH 104 Chemistry-II   (3) 150

Structural concept of Organic Molecules : Introduction. Inductive Effect, Mesomeric Effect, Electrometric Effect.

Hyper-conjugation, Resonance. Effect of these factors on the Physical & Chemical properties of substance.

Organic Reactions & Mechanism : Substitution-Classification, Electrophillic, Nucleophillic and free radical substitution reactions.

Addition - Classification, addition reactions to compounds containing only one double bond. Addition to carbon-carbon double bond and addition to carbon-oxygen double bond with their mechanism.

Elimination-Classification, Beta and Alpha elimination reactions with mechamism in brief.

Free radical reaction in brief.

Stereo Chemistry : Classification, Structural geometrical and Optical isomerism.

Polymers & Polymerisation : Introduction, Physical properties of the polymers, Mechanism of polymerisation, Co-polymers, Co-polymerisation, Classification of polymers, Chemistry of some polymer fibres in brief.

Cellulose : Introduction, Molecular Structure, Physical and Chemical properties. Industrial application of cellulose.

Oils, Fats, Soap and Detergents : General, Physical and Chemical properties, Analysis of oils, fats and soaps. Synthetic detergents in brief.

Reading List

Title	Author
Organic Chemistry	Morrison & Blyd
Text Book of Organic Chemistry	PL Soni
Mechanism in Organic Chemistry	Peter Sykes
Advanced Organic Chemistry, Reaction Mechanism & Structure.	Jerry Manch

ME 110 Industrial Chemistry

1.   Fuels & Combustion :

Classification of fuels calorific value, characteristics of a good fuel, comparison between solid, liquid and gaseous fuels, bomb calorimeter.

2.   Polymers :

Polymers, their nomenclature, polymerisation and its types, effect of polymer structure on properties, mechanical behaviour of polymers, plastics, their classification, plastic molding methods, rubbers, natural and synthetic, calcinisation of rubber, applications of rubber, Thermocole.

3.   Lubricants :

Friction and wear, mechanism of lubrication, classification of lubricants, cutting fluids and selection of lubricants.

4.   Electochemistry :

Introduction, electrolysis, Faraday's laws of electrolysis, electrolytic cell, Galvenic cell, reversible and irreversible cells, lead-acid accumulators.

5.   Corrosion and protection of metals :

Types of corrosion, mechanism of corrosion, corrosion control, organic and metallic coatings for corrosion protection.

6.   Metal Chemistry :

Physical and chemical properties of metals, occurence of metals as ore processing, concentration, roasting and calcination, reduction and refining of crude metal. Manufacture of pig iron, cast iron production, Cupola operation, steel making by Bessemer converter process.

7.   Environmental pollution :

Ecology, factors causing pollution, elementary treatment of air pollution and control, water pollution and control and solid waste management.

Reading List

Title	Author
Engineering Chemistry	Jain & Jain
Material Science	M Lal
Physical Chemistry	Barrow
Fundamental Chemistry	Andrews and Kokes
General Chemistry	Sieno & Plane

PH 106 Physics-II   (3) 150

Conductors & IC's : Introduction to semi-conductors, conductors, insulators and their resistivity. Intrinsic ;and extrinsic semi-conductors. Classification of conductors, insulators and semi-conductors according to forbidden energy gap. Difference between conductors and semi-conductors. Electrical conductivity of semi-conductors. P-N junction and biasing, AC resistance of junction. Junction transistors (NPN & PNP). Fabrication of ICs. Different types of IC's. Fabrication of monolithic IC's. Formation of resistors, capacitors, diodes and transistors in IC's (Chip). Advantages and disadvantages of semi-conductor devices.

X-rays & Crystallographay : Crystalline solids and glassy solids. Unit Cell, crystal lattice, coordination number. Density of packing. SC, BBC, FCC structures, spacing of planes, directional indices and Miller indices. Procedure of finding Miller indices. Relation between interplanar spacing (d) and cubic edge. X-ray diffraction (Bragg's Law). Powder & rotation method for study of crystal structure.

Wave Mechanics : Wave particle dualism. Significance of uncertainty principle and its illustrations.

Optics : Introduction of theories of light. Polarisation and double reffraction (birefringence). Polarisation by reflection and scattering. Wire grid polariser. Brewster's Law & Malus Law. Resolving power of optical instruments. Quarter and half-wave plate. Dichroism. Polariods. Fresnel's theory of rotation and optical activity · Specific rotation and half-shade polarimeter. Optical properties of Textile fibres.

Reading List

Title	Author
Crystallography	Frunt Prof E
Fundamentals of Solid State Physics	Saxena-Gupta-Saxena
Introduction to Solid State Physics	C Kittel
Principles of Solid State Physics	HV Keer
Principles of Electronics	VK Mehta
Fundamentals Optics	Khanna & Gulati

EN 108 Applied Mechanics (3) 150

Motion. Elements - Pairs and Mechanism. Inertia Forces and Dynamical Equilibrium. Friction. Transmission of motion and power. Gear and Gear Trains. Simple stresses and strains. Bending Moments and shear Force Diagrams. Bending stresses. Torsion of shafts.

Fluid Properties. Fluid Masses subjected to acceleration. Kinematics of Fluid Flow. Dynamics of Fluid Flow. Types of Fluid Motion. Rectilinear Motion. Radial Flow. Rotary or Vortex motion-Free Vortex, Forced Vortex, Cylindrical vortex, Spiral vortex.

Reading List

Title	Author
Elements of Applied Mechanics	SB Juanrkar
Elements of Heat Engines	NC Pandya & CS Shah
Fluid Mechanics & Hydraulics	Jagdish Lal

CS 110 Problem Solving and Computer Programming (3) 150

Problem solving with digital computers. Structured programming concept. Algorithms and flow-charts. Step-wise refinement and Characteristics of Algorithm. Elements of Pascal high level language. Data types. Basic Control structures-sequencing, selection and repetition. Arrays. Records and pointers. Sub-programs and parameters passing. Simple file I/O. Numeric and Non-Numeric computation.

Reading List

Title	Author
Computer Programming in PASCAL.	V Rajaraman
An Introduction to Programming & Problem solving with Pascal	G Michael Schneider Stgeven W Weingart & David M Perlman
Programming with Pascal	Byron S Gottfried
Pascal User Manual & Report	Jensen K and Wirth

SS 112 Industrial Economics and Labour Laws   (3) 150

Basic economic concepts and principles of economics, Industrial development in India with particular reference to problems of Industries. Cotton textile/Computer industry of India - its importance, size structure, problems and remedies. Location of Industries, factors influencing location, selection of site, trends of dispersal of industries in India. Rationalization in Industries. Industrial productivity - its importance and factors effecting productivity. Export promotion, wages of industrial workers - methods of payment of wages including wage incentive plans, implications of bonus payment. Industrial policy. Industrial Financing - fixed and working capital, Source of finance, fringe benefits, industrial relations-problems of absenteeism and turnover, grievence handling, machinery-plant level.

An idea about labour and factory legislation, Factories Act, Indian Trade Unions Act, Payment of Wages Act, Industrial Safety Act, Industrial Relation act.

Reading List

Title	Author
Principles of Economics	Dr. KK Dewitt
Indian Industrial Economics	KV Sivayya & VBM Dass
Labour Problems & Social Welfare	BP Tyagi

EN 114 Mechanical Workshop   (4) 1.

Metal cutting processes related to lathe, shaper, drilling, slotter and milling operations.

Weld preparations and metal deposit by both oxyacetylen and electrical processes. Experiments in moulding, preparation of moulding and study of couplas.

Temperature effect in metals in the simple forging processes. Hand forging methods. Processes steps involving upsetting, drawing, bending, punching, drifting and fibre welding.

CS 116 Problem Solving through Pascal   (4) 150

Examples taken from numeric & nonnumeric applications of computers. The emphasis in the course is on teaching the techniques of algorithm development and programming style.

PH 118 Applied Physics Practical   (4) 150

Study of the characteristics of Solar cell.

Determination of self inductance of coil by using AC and DC circuits. Graph between voltage and current (AC & DC).

Study of Magnetic field produced by the Passage of electric current through a circular coil.

Study of temperature dependence of iron resistance coil and thermistor. Plot graph between temperature and resistance.

Frequency of AC by using sonometer and electro magnet.

Determination of the coefficient of viscosity of oil by falling drop method (Stoke's Method).

Determination of the coefficient of viscosity of water by flow method. Relation between pressure and rate of flow.

Determination of Poisson ratio of rubber and plotting graph between dL and dh.

Determination of diameter and TPM of given yarns by using Coaxial Microscope.

Determination of Young's Modulus by bending of beam. Plotting graph between load and depression.

Dark Room Experiments :

Determination of the wave-length of Monochromatic light by using plane diffraction grating.

Determination of the refractive Index of the material of the prism by spectrometer.

Determination of specific rotation and conc. of sugar solution using half shade polarimeter and plotting graph between angle of rotation and concentration.

Investigatory Experiments

Practice in assembling of automatic wireless emergency light (using chip 303).

To study the systolic and diasystolic blood pressure of human body under different ambient conditions.

Study of mass specific resistance of fibres by using Bull clip arrangement in ohmic circuit.

EN 120 Engineering Graphics (4) 150

Concepts of orthographic projection, lettering and dimensioning, plane geometric constructions. Orthographic projections of point, line and planes, Auxiliary and oblique planes, Generating and contour lines, Intersection of Solids, Development of surfaces, Graph and charts. Isometric Views.

SCHEME OF STUDIES

THIRD SEMESTER

SUBJECTS

Index No.	Theory Papers	Hours Per Week
CS201	Data Structrures & Programming Methodology	3
CS203	Problem Solving & Computer Programming-II	3
CS205	Logic Design	3
EN207	Thermal Science	3
EE209	Electrical Engineering	3
MA211	Applied Statistics	3
	Practicals	
CS213	Logic Design Lab	4
CS215	Software Lab-III	4
EE217	Electical Engineering Lab	4

30

FOURTH SEMESTER

THEORY PAPERS

Index No.	Theory Papers	Hours Per Week
CS202	Computer Organisation	3
CS204	System Programming	3
CS206	Data Processing & File Structures	3
MA208	Discrete Mathematical Structures	3
EN210	Microprocessor Technology	3
CS212	Object Oriented Programming	3
	Practicals	
CS214	Software Lab-IV	4
EN216	Microprocessor Lab	4
CS218	Data Processing through COBOL	4
		30

SCHEME OF EXAMINATION

THIRD SEMESTER

SUBJECTS

Index No.	Theory Papers	No. of Papers	Time Hours	Marks of paper	Marks of C/work	Total Marks
CS201	Data Structure & Programming Methodology	1	3	100	50	150
CS203	Problem Solving & Computer Programming-II	1	3	100	50	150
CS205	Logic Design	1	3	100	50	150

EN207	Thermal Science (Common)	1	3	100	50	150
EE209	Electrical Engineering	1	3	100	50	150
MA211	Applied Statistics (Common)	1	3	100	50	150

Practicals

CS213	Logic Design Lab	1	3	75	75	150
CS215	Software Lab-III	1	3	75	75	150
EE217	Electrical Engineering Lab	1	3	75	75	150

FOURTH SEMESTER

THEORY PAPER

CS202	Computer Organisation	1	3	100	50	150
CS204	System Programming	1	3	100	50	150
CS206	Data Processing & file structures	1	3	100	50	150
MA208	Discrete Mathematical Structures	1	3	100	50	150
EN210	Microprocessor Technology	1	3	100	50	150
CS212	Object Oriented Programming	1	3	100	50	150

Practicals

CS214	Software Lab-IV	1	3	75	75	150
EN216	Microprocessor Lab (Common)	1	3	100	50	150
CS218	Data processing through COBOL	1	3	75	75	150

THIRD SEMESTER

SYLLABUS

CS 201 Data Structures & Programming Methodology (3)150

To introduce the tools and techniques required for a disciplined and structured approach towards the development of correct and efficient programs with emphasis on data structures.

Course Content :

Structured approach to programming. Step-wise refinement techniques. Programming style-documentation. Procedures, Scope rules, Recursion. Algorithms for internal sorting and searching. Elementary notations of analysis of algorithms. Time-space trade-off.Study of data structures-arrays, records, stacks, queues, lists and trees. Exiomatic definitions, operations and applications of structures.

Reading List

Title	**Author**
Data Structures using C	AM Tenenbaum
	MJ Augensten
Fundamentals of Data	Ellis Horowitz,
Structure	S Sahni

CS 203 Problem Solving & Computer Programming-II (3)150

To further enhance the skill in problem-solving techniques, programming methdology and programming style as well as the teaching of a largely used high level language 'C'.

Course Content

An overview identifying computer components & their functions. Problem solving, algorithms, effective procedures-techniques in problem solving through C. Scalar data types, basic control structure-sequencing, selection and iteration. Arrays, Records, pointers and Files. Subprograms & parameters passing, simple I/O.

Reading List

Title	Author
The C Programming Language	BW Kernighan M Ritchie
Mastering Turbo C	Stan Kelly Boottle
How to Solve it by Computer	RG Dromey
Systematic Programming	N Wirth

CS 205 Logic Design (3) 150

Launching pad for basic digital electronics in preparation for the subject of Computer Organisation. Teaching the principles of electronic gate circuits used in constructing computer hardware.

Course Content

...... systems. One's and Two'scomplements and signed ....de Binary numbers. Addition, Subtraction of Binary numbers in different representations. Floating point arithmetic. Boolean algebra and logic functions. Minimization of logic functions using gates. Design of combinational circuits - adder, Subtractor, code converter, parity generator, Synchronous and asynchronous sequential circuits, flip-flops, state diagrams - design of counters, shift-registers. A/D and D/A conversion techinques. Storage elements RAM and ROM Design using gates.

Reading List

Title	Author
Modern Digital Electronics	RP Jain
Computer System Architecture	M Morris Mano
Digital Computer Electronics	AP Malvino

EN 207 Thermal Science (3)150

Definitions and basic concepts. Units and measurements. Laws of thermodynamics, thermodynamic behaviour of working substances, circulation of properties in difference phases. Analysis of work production cycles. Steam Generators and their accessories. Fuels and consumption. Heat transfer (elementary theory, e.g.

modes of heat transfer, steady and unsteady heat transfer, simple discussion on the theory of conductivity). Heat exchangers.

Psychromotry, Systems of Humidification in Textile Industry, Air-conditioning Systems, heat load calculations. Operation of plants in textile industry.

Reading List

Title	Author
Heat Engineering	VP Vasandani & DS Kumar
The Theory of Practice of Heat Engines	DA Wrangham
Thermodynamics Applied to Heat Engines	EH Lewit
Air Conditioning in Textile Mills	SP Patel, Subramaniam

EE 209 Electrical Engineering (3)150

Teaching the concepts of basic electrical circuits, theorems and electrical machines for understanding the principles of construction and working of computer hardware.

Course Content

Nodal and Mesh techniques of circuit analysis. Superposition, Thevenin's Nortons and reciprocity theorems. Source free RL and RC circuits, application of the unit-step forcing function to RLC circuit. Natural and forced response of RL, RC and RLC circuits. Over damped, critically damped, Under damped source free and complete response of RLC circuits. Application of Laplace Transform for complete analysis of RL, RC and RLC circuits.

DC Motor - Working principle, equation of armature, torque, characteristics and speed control, DC generator-working principle, Classification, EMF Equation characteristics. Singlephase Transformer - working principle. EMF equation, Ideal and Actual Transformer, Vector diagram, equivalent circuit, open and short circuit tests, regulation and efficiency. Three phase Induction Motor - working, equation of torque, characteristics, equivalent circuit, circle diagram, No load and blocked rotor tests. Single phase

...duction Motor - working and starting methods. Three phase Syn-
.hronous Motor - Working. equation of power in terms of load
angle. V and inverted V curves.

Reading List

Title	Author
A Text Book of Electrical Engg.	BL Theraja
Electrical Engineering Handbook	Siemens
Circuits, Devices and Systems	Ralph J Smith
Theory and Problems of Electric Circuit	Joseph A Edminister

MA 211 Applied Statistics (3)150

Knowledge of this subject is required to understand the prin-
ciples and techniques used in the design of experiments, analysis of
data, interpretation of test results, and in statistical quality control.

Course Content

Measures of dispersion, Moments, Skewness and Kurtosis.
Basic concepts of probability, Discrete and continuous probability
distribution, Laws of expectation. Main features of Binomial, Poisson
and normal distribution and their properties. Their application in
Engineering and Industrial problems.

Analysis of Correlation and Regression (Only Multiple and
Partial) and Rank Correlations. Theory of Attributes. Sampling
theory, Introduction to the theory of Estimation, Test of hypothesis,
t, F, X^2 Test. Simple analysis of variance of one and two way
classification.

Reading List

Title	Author
Mathematical Statistics	Ray & Sharma
Business Statistics	Gupta & Gupta
Statistics	Murray R Spiegel

CS 213 Logic Design Lab (4)150

Experiments based on I.C. Chips, Design of various logic
circuits and their testing.

CS 215 Software Lab-III (4)150

Examples taken from non-numeric applications of computers. The emphasis in the course is on teaching the techniques of algorithm development and programming style.

EE 217 Electrical Engineering Lab (4)150

Practical on A.C. Circuits, D. C. Machine, Transformer, 3-phase induction motor, Machine Tutor.

FOURTH SEMESTER

CS 202 Computer Organisation (3)150

To explain the concepts of hardware organisation of a digital computer. To provide logical exposition of processor organisation machine level programming, input-output organisation, memory organization and modes of communication.

Course Content

Functional Components - Von neumann stored program principle - Instruction execution-memory organisation-instruction formats and addressing modes-machines and assembly language programming-macros subroutines and linkage-relocation-input/output operations-notions of concurrent I/O interrupts-characteristics of simple I/O devices and controllers-modes of communications.

Reading List

Title	Author
Computer Organisation	V Carl Hamacher Zvonko G Vranestic & Safwat G
Computer System Architecture	M Morris Mano
Computer Organisation & Programming	C William Gear
Digital Computer Fundamentals	Thomas C Bartee

CS 204 System Programming (3)150

To give elementary knowledge of the working and applications of assemblers, macros, loaders, compilers and operating systems.

Course Content

Introduction - evolution of system organisation and operating system. Machine structure. Assemblers - introduction, Single pass assembler. Two pass assembler - design concepts. Compilers - introduction, different phases of a compiler. Macroprocessor - introduction, Single pass and two pass Macroprocessor. Loaders - introduction, Absolute loader, Relocatable loader, Dynamic loading and linking. Operating systems - introduction, Memory management, Processor management.

Reading List

Title	Author
System Programming	JJ Donovan
Introduction to System Software	DM Dhamdhere
System Software	Lendell L Beck

CS 206 Data Processing and File Structures   (3)150

This course deals with the software requirements and organisation of data which are essential for data processing applications. Case studies of computer applications and data processing are taught through COBOL.

Course Content

Introduction - characteristics of secondary storage devices file systems - file organisation, operations, device control, managing buffers, data base systems, file organisation techniques - performance of heap, sequential, Indexed sequential, hashed, multi - Indexed, Inverted, and multi-ring files, Sorting and merging files, Relative file organisation - addressing techniques, directing mapping, directory look-up, address calculation technique - collision, Index structures - B-trees-use of files in data processing through COBOL, examples from payroll, Inventory control, Accounting.

Reading List

Title	Author
Data Management and File Structures	Mary ES Loomis
Programming through COBOL	

Theory and Problems of   Martin M Lipschutz
Data Processing   Seymour Lipschutz
Programming with Structured   PS Grover
COBOL

MA 208 Discrete Mathematical Structures   (3)150

The aim of this course is to introduce part of Mathematics which is more relevant to study of computer science and/or is useful for (good) programming practices.

Course Content

Set Theory - basic set operations. Partition of a set. Laws of logic, Relations, Graph of relations. Properties of relations. Matrix of relations. Equivalence and Order relation, definition. Functions- injective, bijective and surjective. Composition of functions - identity and inverse of function. Basic Counting techniques.

Recursion and Recurrence Relations - polynomial and their evaluation. Recursion, Iteration, Induction. Sequences and Discrete functions. Recurrence relations, Generating functions.

Graph Theory - definition. Isomorphic graphs. Connectivity. Transversals. Eulerian graphs, Hamiltonian graphs. Konigsberg Seven - bridges problem. Travelling Salesman problem and Network problem. Search Technique (Depth first and Breadth first).

Boolean Algebra. Latice. Finite Boolean Algebra. boolean Expressions and Application of Boolean algebra to switching theories. Algebaric structures (only definitions and examples of group, sub-group, cyclic group and permutation group).

Reading List

Title	Author
Discrete Mathematical Structure for Computer Science	Bernard Colman Robert C Basby
Applied Discrete Structures for Computer Science	Allen Doerr Kenneth Levasseur
Elements of Discrete Mathematics	CL Liu

EN 210 Micro-Processor Technology   (3)150

This course introduces the architecture and elementary software development for 8085 based systems and explain the use of microprocessors in control operations and enables the students to design simple microprocessor based systems and understand how complex systems can be designed without increasing the hardware complexity.

Course Content

Introduction to micro-processors. Introduction to digital system design. Microprocessor architecture : basic blocks, stored programme concept, machine instructions and their formats, program counter, accumulator, general purpose register. stack and subroutines, buses, data, address and control instruction cycle and machine cycles.

8085 Microprocessor. Memories : ROMs, PROMS, EPROMS, RAMs a small TTL memory, Hexadecimal address.

Microprocessor Programming : Assembly language notation, machine language, addressing modes, programming examples. Input/Output techniques : Programmed I/O, Restart instruction, interrupts, interrupt instructions, serial input, serial output, DMA, polled and vectored interrupts.

Peripheral interfacing : Switches, Keyboards, displays, A/D and D/A converters, printer, cassette recorders, CRT.

Reading List

Title	Author
Microprocessors and Digital Systems	DV Hall
Microprocessor Architecture, Programming and Applications	R Gaonkar
Digital Computer Electronics	AP Malvino
Introduction to Micro-processors : Software. Hardware Programming	LA Leventhal

CS 212 Object Oriented Programming   (3)150

To introduce the new concept of programming paradigm called object Oriented Programming and explain its characteristics, applications and benefits over procedural languages. Students are also trained to write efficient programs in C++.

Course Content

OOP Concepts, Techniques, Basic Components - Objects, Classes, Methods, Data Abstraction and Message Encapsulation, Inheritance in OOP Systems, Concepts, Binding & Polymorphism in OOP Systems - Concepts. Introduction to C++.

Reading List

Title	Author
Object Oriented Programming in Turbo C++	Robert Lafore
Object Oriented Analysis and Design with applications	Grady Booch
Applying C++	Robert Ladd
C++ and OOP Paradigm	Bindu R Rao

CS 214 Software Lab-I   (4)150

Programming in C++ based on CS 212.

EN 216 Microprocessor Lab   (4)150

Preliminary Experiments (PE). Elementary Programming Exercises (EPE). Input Output Experiments (IOE). Project Demonstration (PD).

CS 218 Data processing through COBOL   (4)150

Writing of programs in a suitable programming language (COBOL) to handle different file organisation. Implement applications and examples covered in lectures. Use of data base systems.

SCHEME OF STUDIES

FIFTH SEMESTER

SUBJECTS

Index No.	Theory Papers	Hours Per Week
CS301	Data Communication and Networking	3
CS303	Automata, Language and Computation	3
CS305	Computational Numerical Analysis	3
CS307	System Analysis and Design	3
MS309	Business, Environment and Marketing Management	3
CS311	Database Management Systems	3
	PRACTICALS	
CS313	Software Lab-V	12
		30

SIXTH SEMESTER

Index No.	Theory Papers	Hours Per Week
CS302	Operational Research	3
CS304	Computer Graphics	3
CS306	Principles of programming languages	3
CS308	Complier Design Principles	3
CS310	Operating Systems	3
MS312	Financial, Material & Personnel Management	3
	PRACTICALS	
CS314	Computer Graphics Lab	6
CS316	Software Lab-VI	6
		30

SCHEME OF EXAMINATION
FIFTH SEMESTER & SIXTH SEMESTER

SUBJECTS

Index No. Theory Papers	No. of Papers	Time Hours	Marks of paper	Marks of C/work	Total Marks
CS301 Data Communication & Networking	1	3	100	50	150
CS303 Automata, Language & Computation	1	3	100	50	150
CS305 Computational Numerical Analysis	1	3	100	50	150
CS307 System Analysis & Design	1	3	100	50	150
MS309 Business, Environment & Marketing Management	1	3	100	50	150
CS311 Database Management System	1	3	100	50	150
CS313 Software Lab-V	1	3	75	75	150
CS302 Operational Research	1	3	100	50	150
CS304 Computer Graphics	1	3	100	50	150
CS306 Principles of Programming Language	1	3	100	50	150
CS308 Compiler Design Principles	1	3	100	50	150
CS310 Operating Systems	1	3	100	50	150
MS312 Financial, Material and Personnel Management	1	3	100	50	150
CS314 Computer Graphics Lab	1	3	75	75	150
CS316 Software Lab-VI	1	3	100	50	150

FIFTH SEMESTER

CS 301 Data Communication and Networking

(3) 150

This course provides an overview of the communication principles and the systems involved in transmitting digital signals over some distance. An introduction to computer network is also offered.

Course Content :

Communication concepts, channel, design characteristics, noise, modulation-fundamentals of data communication, data rates, full duplex, asynchronous communication, encoding at bit, byte & frame levels - error detection and correction data communication sub-systems. Pulse Analog and Digital Modultion. Multiplexing in frequency domain and time domain including statistical multiplexing, telephone system characteristics, modem.

Networking goals and application-network topology design-cost, delay, throughput and realibility-packet switching vs. circuit switching - broadcast channel access in satellite-based networks-local area bus and ring structures-OSI reference model-protocol hierar-chy-datalink, network transport, and other higher layer protocols-network services-electronic mail, file transfer, remote login-communication protocol standards.

Reading List

Title	Author
Communication Systems	Simon Haykin
Data Communication and Distributed Networks	Ulyess D Black
Data Communication Technology	James Martin
Digital, Analog and Data Communication	William Sinnema

CS 303 Automata, Language and Computation   (3)150

To acquaint the students with the development of standard mathematical models of computational devices and investigate the

cognitive and generative capabilities of such machines so that they acquire mathematical maturity for understanding the limitations of mechanical computation and formal specifications of languages.

Course Content

Finite state machines-state diagrams-Moore and Mealy models-deterministic and non-deterministic automata, minimisation-regular sets, regular expressions-grammars-algebra of regular expressions-grammars-Chomskian hierarchy-pushdown and linear bounded automata-closer properties and deterministic push down automata-Turing machines-variants of Turing machines.

Reading List

Title	Author
Theory of Finite Automata	John Carroll
	Darrell Long
Introduction to Automata Theory Language and Computation	Hopcsoft & Ullman

CS 305 Computational Numerical Analysis (3)150

This subject introduces various methods of solving mathematical problems by numerical computation and also provide inspiration for mathematical creativity.

Course Content

Calculus of Finite differences. Fundamental theorems of differential calculus, factorial notation, Operator E, Mew and Delta. Interpolation with equivalent rows and unequivalent rows. Centre difference interpolation formula. Numerical Differentiation and integration - Trapezoidal rule. Simson's one-third rule, three-eighth rule, Widal's rule. Solutions of non-linear equations. Linear systems and matrix inversion; Eigen values and Eigen vectors. Least squares and ordinary Differential equations.

Reading List

Title	Author
Calculus of Finite Differences and Numerical Analysis	Gupta & Malik

CS 307 System Analysis & Design   (3)150

To develop skill for analysing the systems and methods of work of any real life situation/activity and to organise the system findings by structured analysis techniques. To acquaint the students with different structured analysis techniques.

Course Content

Fundamental System concepts. Phased approach analysis. Creation of high level data flow diagrams. Data dictionary; simplification of contents of data stores; process logic specification. Structured approach for system design; input to structured design; building a logical model of the new system and its objectives.

Reading List

Title	Author
System Analysis & Design	Don Yeates

MS 309 Business, Environment and Marketing Management
                                                        (3)150

To make the students aware of the economic, social, political, legal, technological and business environment which influence managerial decision making.

Course Content

Business : Changing concept and objective of Business; professionalisation; Business Ethics; Social Responsibility of Business - Responsibility to Shareholders, Employees, Consumers, and to the Community. The Indian situation.

Environment : Meaning of Environment, Constituents of Business Environment; Economic, Social, Political, Legal and Technological Environment; Relation between Firm and its Environments

Management : Definition; Teylor's Principles of Scientific Management; Henry Fayol's Principles of Management; and Human Relations Approach; Functions of Management : (i) Planning, (ii) Organising, (iii) Staffing, (iv) Directing, (v) Controlling. Forms of Organisation structures. Line organisation; Functional organisation, Line and Staff Organisation their Merits and Demerits.

The Marketing Process : Components Factors Influencing marketing process : Modern Marketing Process.

The Market Concept : Features/Premises of Modern Marketing Concept.

Marketing Management : Meaning and Importance; Marketing Mix- A very brief description of Product Mix, Price Mix, Distribution Mix, and Promotion Mix.

Reading List

Title	Author
Principles of Marketing	Philip Kotler
Fundamentals of Marketing	Cundiff, Still, Goreni
Modern Marketing Management	Davar
Business Environment	Francis Cherunilan
Govt. and Industry	PK Ghosh
Economic Environment of Business	M Adhikari

CS 311 Data Base Management Systems   (3)150

To introduce different data organising techniques with emphasis on storage and retrival of data and the comparison of different organising techniques.

Course Content

Introduction. Data Independence. Data models. Brief review of the file organisation techniques. Network model-DBTG proposal

implementation. Data definition and manipulation languages. Hierarchical model. Relational model. Storage organisation for Relations. Relational algebra and Relational calculus. Relational query languages. Query processor and optimizer. Functional dependencies-normal forms, multivalued dependencies. Decomposition of relation schemes. Integrity constraints - protection, security and concurrency of operations on databases. Database Recovery. Distributed database machines. Comparison of available Database systems.

Reading List

Title	Author
An Introduction to Data Base System	CJ Date
Computer Database Organisation	James Martin
Database Processing-Fundamental Design and Implementation	David Kroenke
Logic Algebra and Databases	Peter Grey

CS 313 Software Lab-V   (12)150

Programming assignments to supplement the learning in CS 311.

CS 302 Operations Research   (3)150

To understand the relevance of operations research in the context of modelling with special emphasis on decision making and pertinence of various techniques in different application areas. Building of algorithms for various methods. The mathematical derivations are not considered.

Course Content

Linear Programming - extreme point solutions. Simplex method-computational procedures. Quality problems - degeneracy. Revised simplex, Sensitivity analysis. Introduction to nonlinear programming Dynamic programming. PERT/CPM problems. Transportation and Assignment problems. Network flows. Simple inventory models.

Reading List

Title	Author
Principles of Operations Research	Harvey M Wagner
Principles of Operations Research for Managers	Frank S Budnick
Operations Research - Methods and Practices	CK Mustafi

CS 304 Computer Graphics (3)150

The use of computer graphics to enhance information transfer and understanding is endemic in all scientific and engineering disciplines. The basic concepts and programming skills in the field of Computer Graphics are introduced through this subject.

Course Content

Graphic Input devices (Mouse, Light Pen). Graphic display devices-Storage CRT display, Calligraphic display, Raster scan display. Line and circle plotting using Bresenham's algorithm. Windowing and Clipping, Sutherland-Cohen approach, Mid-point sub division algorithm. Curve drawing using Hermite polynomial, Bezier curves, B-splines. Picture transformation-translation, rotation, scaling, mirror images. 3-D graphics, 3-D transformations-rotation about an arbitrary axis, orthogonal projections, multiple views. Isometric projections, perspective projection (1,2,3 vanishing points).Curved surface generation, hidden surface removal.

Reading List

Title	Author
Principles of Interactive Computer Graphics	Newman & Sproull
Procedural Elements for Computer Graphics	David F Rogers
Computer Graphics (Schaum's Outline series)	Roy A.Plastock
Computer Graphics A Programming Approach.	Stever Harrington

CS 306 Principles of Programming Languages (3)150

To introduce various program constructs and their binding problems. To discuss data abstraction concept and different control structures and related topics.

Course Content

History of Development, Features, Application areas and Design Philosophy of High Level Languages. Notion of syntax and Semantics. BNF and context-free Grammar.

Block structured languages. Design principles. Abstraction – control and data types. Binding, Environment and scope rules. Parameter passing mechanism. Semantic introduction to functional language - Study of LISP - Programming style, Basic Control structures, Property lists and macro expansion via LISP - data types. Comparative look at Pascal, Fortran, Cobol, C and Lisp.

Reading List

Title	Author
Fundamentals of programming languages	Ellis Horowitz
Programming Language Concepts	Carlo Gheezi
	Mehdi Jazayeri
Lisp second edition	Partick H Winston
	Berthold P Horn

CS 308 Compiler Design Principles (3)150

This course introduces the design and implementation of various phases of compiler construction for understanding the system software and language processing.

Course Content

Compilers and Translators. Lexical and syntax analysis. Top down, Bottom up and Operator Precedence parsing techniques. Internal form of source program. Semantic analysis. Symbol tables. Error detection and recovery. Code generation and optimisation.

Reading List

Title	Author
Principles of Compiler Design	Aho and Ullmann
Compiler construction- Principles and Practice	DM Dhamdhere
Compiler construction Theory & Practice	A Barrett, RM Balts

CS 310 Operating System   (3)150

This course provides an insight into the concepts of time and resource management and device-handling. The operating system is an integral and essential part of computer installation.

Course Content

Historical perspectiveness - batch processing, time sharing-functions and components of an operating system - review of device drivers - file system, directory structure, gaining access to files -basic file system calls - interrupt mechanisms - concurrent processes, mutual exclusion, synchronization - process management, switching, scheduling, synchronising - memory management swapping, segmentation paging, Virtual memory, page replacement and space allocation policies - segmented paging, dynamic linking, coaching of secondary storage information - I/O scheduling policies - terminal I/O handling - deadlocks - protection - case study. UNIX and DOS internals.

Reading List

Title	Author
Operating Systems	S Madnick & JJ Donovan
Operating System Concepts	JL Peterson & A Silberachitz

MS 312 Financial, Material and Personnel Management
(3)150

To acquaint students with the concepts of accounting and

finance, personnel and materials management and their relevance in managerial decisions.

Course Content

Basic Accounting Concept : Need and Branches, Double Entry System and records - Journal, Ledger, Trial Balance and Balance sheet.

Sources of Finance : A very brief introduction and listing of internal and external source of finance.

Management of working capital : Nature, Concept and Classification. Factors affecting requirement of working capital.

Capital Structure : Meaning, Essentials of an optimum capital structure, Determination of Capital structure.

Personnel Management : Meaning, Need, Importance and Scope selection. Training and development compensation, Performance appraisal and industrial relations.

Materials Management : Definition, Objectives, Scope.

Inventory Management : Importance and Techniques-EOQ, ROL, ABC Analysis, Stock turnover and Lead time.

Reading List

Title	Author
Double Entry Book Keeping	TS Grewal
Management Accounting	RK Sharma & SK Gupta
Personnel Management	CB Memoria
Production Management	Goyal & Gupta
Management of Human Resources	AF Sikula & MC Kenna John F

CS 314 Computer Graphics Lab   (6)150

Programming assignments to supplement the learning in class.

CS 316 Software Lab-VI   (6)150

LISP programming, implementation of various compiler phases using LEX and YACC.

SCHEME OF STUDIES

SEVENTH SEMESTER

SUBJECTS

Index No.	Theory Papers	Hours Per Week
CS401	Artificial Intelligence	3
CS403	Advanced Computer Architecture	3
CS405	Elective-I	3
CS407	Elective-II	3
	Practicals	
CS409	Seminar	2
CS411	Project	8
CS413	Computer AI Lab	4
CS415	Digital Hardware Lab	4
		30

EIGHTH SEMESTER

CS402	Practical training Report, Seminar & Viva-voce.	

NOTE :

After completion of B.Tech (CS) seventh semester, the students will undergo for one semester practical training in any recognised computer centre/industry/institution. This training will be held in the eighth semester in continuation with winter vacation succeeding the seventh semester. The actual duration of training will depend on the nature and size of the project allotted to the student. However, the total duration of training should not be less than four and a half months. After completion of training each student will submit the consolidated report duly approved by the training authority. The viva-voce examination and evaluation of the report will be conducted by a board of examiners consisting of two internal and two external.

SCHEME OF EXAMINATION

SEVENTH SEMESTER

SUBJECTS

Index No.	Theory Papers	No. of Papers	Time Hours	Marks of paper	Marks of C/work	Total Marks
CS401	Artificial Intelligence	1	3	100	50	150
CS403	Advanced Computer Architecture	1	3	100	50	150
CS405	Elective-I	1	3	100	50	150
CS407	Elective-II	1	3	100	50	150
	Practicals					
CS409	Seminar	1	2		100	100
CS411	Project	1	Viva Voce	200	100	300
CS413	Computer AI Lab	1	3	75	75	150
CS415	Digital Hardware Lab	1	3	75	75	150

EIGHTH SEMESTER

CS401	Practical training Report, Seminar & Viva Voce	1	Viva Voce	300	200	500

SYLLABUS

CS 401Artificial Intelligence   (3) 150

To acquaint the students to the basics of AI and its applications in the field of natural language, inference, planning, expert system, vision, robotics, etc. Introduction to Prolog language which is widely used in AI applications.

Course Content

Meaning of AI, Representing Facts, Variables & Queries, Definitions and Inferences, Arithmetic and Lists in Prolog, Control Structures for Rule Based System, Implementation of Rule Based System, Representing Uncertainty in Rule-Based Systems, Search, Implementing Search. Natural language processing, Question-answering, vision, expert system, etc.

Reading List

Title	Author
Artifical Intelligence through Prolog.	Neil C Rowe
Artifical Intelligence	Elaine Rich
Introduction to Turbo Prolog	Carl Townsend

CS 403 Advanced Computer Architecture   (3)150

This course provides more comprehensive knowledge in computer architecture and makes the students know about latest developments in computer hardware industry as well as R & D.

Course Content

Basic computer organisation - CPU design - memory systems - bus structure - processing - expectations - language features that influence architecture - memory management - computer arithmatic, floating point processor - microprogramming -microprocesors - bit slice architecture - multiprocessor architectures- shared memory, loosely coupled - associative processors - inter-connections networks - pipelined architecture-tagged architecture-dataflow architecture-special purpose architecture

performance evaluation- cache memories - language for parallel/ distributed computation-cache memories-language for parallel/ distributed computation-operating system for distributed systems.

Reading List

Title	Author
Computer Architecture & Parallel Processing	Hwang & Briggs
Microprocessor and Interfacing	Douglas V Hall

Elective I, II .   (3)150   (3)150

Two out of the following six :

(A)   Analysis and Design of Algorithms :

To qualitatively define the computational complexity of algorithms and to introduce the relevant mathematical tools. To discuss the methodologies for developing algorithms for searching and sorting and to compare the same in the context of computational complexity.

Course Content

Basic Design methodologies. Divide and conquer, Dynamic programming. Greedy algorithms. Algorithms for set manipulation. Matrix multiplication. Pattern matching and integer and polynomial arithmetic. Depth first search and its application. Introduction to the theory of lower bounds.

Reading List

Title	Author
Fundamentals of Computer Algorithms	Sartaj Sahni Ellis Horowitz
Design and Analysis of Algorithms	A V Aho, JE Hoproft, JD Ullman
Fundamental Algorithms (The Art of Computer Programming Vol. I)	DE Kruth
A Discipline of Programming	ED Digkstra
Writing Efficient Programs	Jon DL Bently

(B)   Simulation & Modelling :

To introduce the subject and explain the techniques of continuous and discrete system simulation and the programming techniques involved in the design and construction of simulation programming systems.

Course Content

Systems and models-discrete and continuous simulation-programming considerations and languages - GPSS, SIMSCRIPT II AND SIMULA. Random numbers generator, testing of random number, stochastic variates generation-output analysis-control of length of simulation-verification and validation of simulation.

Reading List

Title	Author
System Simulation	Geoffrey Gordon

(C)   Software Engineering :

Highlighting the importance of using structured approach for designing algorithm and teaching the basic ingradients of structured approach. Various methodologies for designing and developing problem solutions algorithmically are discussed with the help of examples. Matter related to solution implementation and software maintenance are discussed with the help of illustrations.

Course Content

Techniques of Structured programming, Information hiding, Coupling & Complexity measures, Software engg. concepts and methodology. Software project planning. Design techniques. Programming. Code Review, Integration, Testing and Validation. Quality Assurance. Software Maintenance.

(D)   Computer Aided Design of Digital Systems :

To develop skill in designing and testing electronic circuits using computer simulation packages with special emphasis on VLSI circuit design.

Course Content

Introduction to VLSI design methodologies and supporting CAD tool environment; Concepts, Structures and algorithms of some of the following CAD tools :

Schematic editors;
Layout editors'
Module Generators;
Place and Route tools;
Floor Planning'

Behavioral, functional, logic and circuit simulation. Aids for test generation and testing. Computational complexity issues : big Oh and big O terms; Simulation Algorithms : compiled code and Event-driven; Optimization Algorithms : greedy method simulted annealing; Silicon compilers; Recent topic in CAD-VLSI : Array Compilers, High-level synthesis tools and Hardware-Software codesign, VHDL modeling.

Reading List

Title	Author
Computational Aspects of VLSI	JD Ullman
Digital Testing and Simulation	Alexander Miczo, Harper and Row

(E) Process Control and Instrumentation :

To introduce the techniques used in process automation and automatic control systems. Study of transducers used in any physical system required in computeriation.

Course Content

Principles of measurement : error, accuracy, sensitivity. Pressure measurement : pressure gauge, strain gauge, summing devices. Temperature measurement : thermocouple, resistance thermometer, thermistor, optical and radiation pyrometers. Level and flow measurement devices. Humidity measurement.

Basic concepts of feedback control : Control loop and its elements, Dynamic behaviour of first, second and higher order physical systems. Lumped and distributed parameter systems. Linear system transient analysis using Laplace Transforms. Frequency response analysis : Bode and Nyguist stability criteria.

Reading List

Title	Author
Automatic Control Systems	BC Kuo
Control System Engineering	Nagrath Gopal
Electronic Instrumentation & Measurement Techniques	ED Cooper
Electrical & Electronic Measurement & Instrumentation	AK Sawhney

(F)   Digital Image Processing & Pattern Recognition

Introducing the techniques for digitization of image elements and methods of transforming images in terms of image elements processing. Various statistical methods relevant to image/recognition are discussed. Relevance of pattern recognition to natural language processing and industrial applications.

Course Content

Description of continuous images, scene analysis, sampling, a quantisation of images, Image compression, image enhancement, sampling, Image Processing applications; Automatic navigation computer vision systems etc.

Geometrical and statistical theory of pattern recognition and inferences, natural language processing, Recognition of 2-D and 3-D objects, issues concerning representation and learning, speech recognition and synthesis, Industrial applications.

Reading List

Title	Author
Computer Vision Graphics and Image Processing	Academic Press INC, New York

CS 409 Seminar (2)100

Topic will be given by the faculty.

CS 411 Project (8)300

Theoretical and/or experimenal design project(s) depending upon the interests of the student(s) and facutly.

CS 413 Computer AI Lab (4)150

Based on lecture materials of AI.

CS 415 Digital Hardware Lab (4)150

Program designing using 8086 microprocessor kits. Digital hardware elements and their description in a hardware description language; hardware, software and firmware considerations in designing control units for arithmetic and logic processors. Designing microprocessor based system using MICROLAB.