

# SYLLABUS

**Faculty of Engineering and Technology**



**INFROMATION TECHNOLOGY**

**MAHATMA GANDHI CHITRAKOOT GRAMODAYA VISHWAVIDYALAYA  
CHITRAKOOT, SATNA (M.P.) - 485 331**

**MAHATMA GANDHI CHITRAKOOT GRAMODAYA  
VISHWAVIDYALAYA**

**ORDINANCE FOR B.TECH.**

Programme Offered	: B.Tech. (Information Technology) : B.Tech. (Food Technology) : B.Tech. (Agricultural Engineering)
Intake	: 30 Students in each course, can be increased with permission of AICTE.
System of Education	: Credit System on semester basis.
Eligibility for Admission	: 10+2 With Physics, Chemistry and Mathematics or Equivalent.
Mode of Admission	: Entrance examination conducted by VYAPAM, Bhopal.
Duration of Course	: 8 Semesters
Examination and Evaluation	: Internal (20%) + External (80%)
Grading	: 10-point scale

Evaluation of the programme will be referred to as grading and shall be measured by the quality of performance in that course by assigning course grade as indicated below :

Comulative Grade Point Average	: Description of Performance
8.5 to 10.0	: First Class with distinction
6.5 to 8.4	: First Class
5.0 to 6.4	: Second Class
Below 5.0	: Fail

Student obtaining Grading point of less than 5.0 will be declared as Fail (F). The course with grade point of 5.0 or more will be treated as cleared.

**Minimum OGPA required for degree :** To qualify for a degree the student shall complete all the prescribed courses with CGPA of not less than 5.0

**Grade :** It is a measure of quantity of the performance of a student work done in a course at the end of a semester. It is computed by dividing the percentage of marks obtained in a course by ten. It shall be expressed on a 10-point scale upto first decimal place.

**Grade-Point :** A grade point is product of course credit and grade secured by a student in a course. It shall be expressed upto first decimal place.

**Grade-Point Average :** It is a measure of Quantity of work done in a semester. It is a quotient of the total grade point secured by a student in various courses registered in a semester divided by the total course credit during that semester. It shall be expressed upto first decimal Place.

**Cumulative Overall Grade-Point Average (CGPA) :** It is a measure of overall cumulative performance of a student on completion of two or more semesters. It is computed by dividing total member of course grade points earned by a student over the semesters by the total number of credits. It shall be expressed upto first decimal place.

**Attendance :** Normally the attendance should be 100%. The Minimum required by a student is 80%. The attendance can be condoned by Dean /Director/CSSC upto 10% on justifiable grounds.

**Maximum number of semesters permitted to complete the course :** 12 semesters

**Make-up examination :** The students of final year shall be allowed for make-up examination on one or more grounds such as hospitalisation; death of parents; own marriage; attending interview and attending court case (s) etc.

**Procedure for awarding sessional marks :** For theory subjects one midterm exam of 10 marks will be conducted, 5 marks for assignments and five marks for quizzes are given by the subject teacher .

**Procedure for evaluation of practicals/extension etc. :** The internal assessment will be based on practicals, extension work, the submitted report, test conducted if any and attendance (attendance valuation not more than 20%). End semester evaluation will normally involve external examiner.

**Fee :** As prescribed by the VYAPAM/University from time to time.

Matters not provided for in this ordinance shall be governed by the orders of the Chairman Academic Council.

Effective from Batch 2006-2007

Course curriculum of B. Tech. (Information Technology)									
1st Semester					2nd Semester				
Sr.	Course Name	Credit	CFA	ESE	Sr.	Course Name	Credit	CFA	ESE
1.	Engg. Physics	4	20	80	1.	Engg. Chemistry	4	20	80
2.	Engg. Physics Lab	2	20	80	2.	Material Sc. & Technology	4	20	80
3.	Engg. Maths –I	4	20	80	3.	Engg. Maths –II	4	20	80
4.	Communication Skill	3	20	80	4.	Engg. Mechanics	4	20	80
5.	Engg. Graphics	4	20	80	5.	Basic Mechanical Engg.	4	20	80
6.	Workshop Practice	4	20	80	6.	Engg. Mechanics Lab	2	20	80
7.	Computer Programming – Lab	3	20	80	7.	Computer Programming –II Lab	4	20	80
8.	Fundamental Computer	2	20	80	8.	Engg. Chemistry Lab	2	20	80
9.	Basic Electrical Engineering	4	20	80	9.	Fundamental of Computer	2	20	80
10.	Basic Electrical Engg. Lab	2	20	80	10.	Basic Mechanical Engg. Lab	2	20	80
11	V.S.R.	2	100	-	11	V.S.R.	2	100	-
3rd Semester					4th Semester				
Sr.	Course Name	Credit	CFA	ESE	Sr.	Course Name	Credit	CFA	ESE
1.	Mathematics III	4	20	80	1.	Information Theory & Coding	4	20	80
2.	Instrument & Measurement	4	20	80	2.	Analog & Digital Comm.	4	20	80
3.	Digital Electronics & Microprocessor	4	20	80	3.	Data Structure & Organization	4	20	80
4.	OOP Methodology	4	20	80	4.	Computer Architecture & Organization	4	20	80
5.	Energy, Ecology & Environment Science	4	20	80	5.	Discrete Structure	4	20	80
6.	Instrument & Measurement Lab	2	20	80	6.	Computer Programming Lab	4	20	80
7.	Computer Programming III Lab	4	20	80	7.	Information Theory & Coding	2	20	80
8.	Digital Electronics & Microprocessor Lab	2	20	80	8.	Analog & Digital Comm. Lab	2	20	80
9.	OOP Methodology Lab	2	20	80	9.	Data Structure & Algorithms Lab	2	20	80
10.	V.S.R.	2	100	-	10.	Computer Architecture & Organization Lab	2	20	80
					11	V.S.R.	2	100	-
5th Semester					6th Semester				
Sr.	Course Name	Credit	CFA	ESE	Sr.	Course Name	Credit	CFA	ESE
1.	Data Communication	4	30	70	1.	Adv. Microprocessor & Interfacing & Interfacing	4	30	70
2.	Operating System	4	20	80	2.	Software Engineering	4	20	80
3.	Data Base Management System	4	20	80	3.	Digital Signal Processing	4	20	80
4.	Principles of mgt. & Multimedia	4	20	80	4.	Computer Networking	4	20	80
5.	Computer Graphics & Multimedia	4	20	80	5.	Cellular & Mobile Communications	4	20	80
6.	Workshop (Computer Hardware) Lab	4	20	80	6.	Adv Microprocessor & Interfacing Lab	2	20	80
7.	Data communication Lab	2	20	80	7.	Software Engineering Lab	2	20	80
8.	Data Base Management System Lab	2	20	80	8.	Computer Networking Lab	2	20	80
9.	Computer Graphics & Multimedia Lab	2	20	80	9.	V.S.R.	2	100	-
10.	V.S.R.	2	100	-					
7th Semester					8th Semester				
Sr.	Course Name	Credit	CFA	ESE	Sr.	Course Name	Credit	CFA	ESE
1.	Mgt. Information System	4	20	80	1.		4	20	80
2.	Networking with TCP/P	4	20	80	2.	Web Engineering	4	20	80
3.	Elective - I	4	20	80	3.	Elective – I	4	20	80
4.	Compiler Design & Translator	4	20	80	4.	Elective – II	3	20	80
5.	Elective - II	4	20	80	5.	Distributed Systems Lab	2	20	80
6.	Networking with TCP/IP Lab	2	20	80	6.	Web Engineering Lab	2	20	80

7.	Compiler Design & Translator Lab	2	20	80		7.	Major Project	8	20	80
8.	Minor Project	4	100	-		8.	Seminar	4	100	-
9.	Industrial Training	3	100	-						
10	Seminar	2	100	-						

## Department of Electronics & Computer Sciences (List of Labs.)

*Name of Labs*

*Clubbed To*

i.	Instrument & Measurement Lab	I.T
ii.	Computer Programming – Lab	I.T
iii.	Digital Electronics & Microprocessor Lab	I.T
iv.	Data Structure & Algorithms Lab	I.T
v.	OOP Methodology Lab	I.T
vi.	Analog & Digital Comm. Lab	I.T
vii.	Computer Architecture & Organization Lab	I.T
viii.	Workshop (Computer Hardware) Lab	I.T
ix.	Data communication Lab	I.T
x.	Data Base Management System Lab	I.T
xi.	Computer Graphics & Multimedia Lab	I.T
xii.	Adv. Microprocessor & Interfacing Lab	I.T
xiii.	Software Engineering Lab	I.T
xiv.	Computer Networking Lab	I.T
xv.	Networking with TCP/IP Lab	I.T
xvi.	Computer Design & Translator Lab	I.T
xvii.	Distributed Systems Lab	I.T
xviii.	Web Engineering Lab	I.T

**B.Tech. (Information Technology) I Sem**  
**Sub: Engineering Mathematics I (3+1+0)**

**UNIT- 1**

Maclaurin's and Taylor's theorem. Partial differentiation. Euler's theorem and its application in approximation and error. Maximum and minimum of one and two variables. Tangents and Normal. Curvature, Indeterminate forms.

**UNIT- 2**

Definite Integral as limit of a sum, Application in summation of series. Beta and Gamma functions. Double and triple integral. Length of the curves, Volumes and surfaces.

**UNIT- 3**

Ordinary differential equations of first order. Linear higher order differential equation with constant coefficients. Homogeneous linear differential equation. Simultaneous differential equations.

**UNIT - 4**

Rank, Solution of simultaneous equation by elementary transformation, Consistency of equation. Eigen Value and Eigen Vectors. Cayley-Hamilton theorem. Algebra of Logic, Fuzzy Logic.

**UNIT- 5**

Boolean Algebra Principle of Duality Basic theorems, Boolean expressions and functions. Graph Theory, Graphs Sub graphs, degree and distance, Tree, Cycles and Network

**References:**

1. Differential Calculus- By Gorakhprasad
2. Higher Engg. Mathematics- By B.S. Grawal.
3. Integral Calculus- By A.R. Vashishta & H.K. Sharma.
4. Statistics- By Ray and Sharma
5. Boolean Algebra – By Thakur & Shrivastava
6. Higher Engg Mathematics- H.K.Dass

## **B.Tech. (Information Technology) I Sem**

### **Communication Skill (3+0+0)**

#### **UNIT-I**

##### **LANGUAGE AND SKILL OF COMMUNICATION:**

Linguistic Techniques, Modern usage and style – comprehension skills, English Phonetic symbols/signs, Oral Presentation- Audition.

#### **UNIT-II**

##### **APPLICATION OF LINGUISTIC ABILITY:**

Writing of definitions of engineering terms, Objects, processes and principles (Listening). Topics of General Interest, Reproduction from business, daily life, travel, health buying & selling, company structure, systems etc.

#### **UNIT -III**

##### **LETTER WRITING:**

Applications, Enquiry, Calling quotation, Tenders. Order and complaint.

#### **UNIT-IV**

Precise Writing, Noting and drafting, Technical Descriptions of simple engineering objects and processes (Writing) Report writing, Précis writing, note writing, slogan writing comment, speech advertising.

#### **UNIT -V**

Writing technical reports of the type of observation report, Survey report, Report of trouble, Laboratory Report and Project Report on the subjects of engineering. (Speaking) Vocabulary, Presentations, Demonstrations, Conversation- Telephone media, socializing, cultural events, debates, speech.

##### **References:**

1. Business Correspondence and Report Writing – By Krishna Mohan, Prentice Hall India
2. Living English Structure – By W. Stannard Allen, Longmans.
3. Student's Grammar- By Dev Willys Collins (Harper)
4. Spoken English for India – By R.K. Bansal & IB Garrioson (Orient Longman)
5. New International Business English – By Joans and Alexander (OUP)
6. Testing English as a Second Language – By David P. Harris (McGraw Hill Pub.)

## **Basic Electrical Engineering (3+1+2)**

#### **UNIT -I**

##### **AC CIRCUITS**

Review of Single-phase AC circuits under sinusoidal steady state. Active, reactive and apparent power, power factor. 3- Phase AC circuits, star and delta connections. Three Phase source and load. Analysis of balanced and unbalanced systems. Power in three phase circuits and their measurements.

#### **UNIT -II**

##### **MAGNETIC CIRCUITS**

Review of laws of electromagnetism. Flux, M.M.F and their relation. Analysis of magnetic and electric circuits. Saturation, B-H curves, fringing and leakage. AC excitation in magnetic circuits. Induced voltage, Hysteresis effect and eddy currents.

#### **UNIT -III**

##### **TRANSFORMERS**



Single-phase transformer, Basic concepts and construction features. Types of transformers, Voltage, current and impedance transformation. Equivalent circuits. Per unit system, voltage regulation, losses and efficiency. Testing of transformers. Auto transformers.

#### **UNIT -IV**

##### **ELECTRO MECHANICAL ENERGY CONVERSION**

Principles of energy conversion. Production of force and e.m.f. Singly and multiply excited magnetic field system. Torque production and torque balance. General analysis of electromechanical System.

#### **UNIT -V**

##### **ROTATING ELECTRIC MACHINES**

General construction. Definitions and terminologies, generation of e.m.f in rotating machines. Voltage in DC and AC machines. Airgap e.m.f in DC and AC machines. Rotating magnetic field. Torque production. Principle of operation and application of DC Machine, Three phase synchronous and induction machines. Single phase induction motors. Insulating materials, name plate rating, frame size, duty cycles, cooling, enclosures materials and standards.

#### **Practical:**

- Measurement of impedance of RL, RC and RLC circuits. Study of Resonance phenomenon
- Measurement of active and reactive powers in single phase and three phase
- Study of no load current waveform in a single phase transformer using CRO
- Study of transformer name plate rating, determination of ratio and polarity Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions. Verification by load test
- Study of constructional features of DC machines. Magnetization and load characteristics of DC generator
- Characteristics of DC motors. Study of 3 and 4 point starters for DC shunt motors
- Speed control of DC motor by armature resistance control and field resistance control and armature voltage control
- Study of constructional features of three phase induction motors. No load, blocked rotor and load tests on three phase Induction motors
- Starting methods and construction of Single phase Induction motors.

#### **References:**

1. Electrical Machinery, A.E. Fitzgerald, C. Kingsley and Umans, Mc Graw Hill, 5th Edition, 1992
2. Principles of Electrical Engineering, Vincent Del Toro, Prentice Hall, 1987
3. Basic Electrical Engineering, A.E. Fitzgerald, Higginbotham and Grabel, Mc Graw Hill
4. Basic Electrical Engineering, I.J. Nagrath, Tata Mc Graw Hill, 1991
5. Electrical Machinery, P.S. Bimbhara
6. Basic Electrical Engineering, V.N. Mittle

## **Engineering Physics (3+1+2)**

#### **UNIT -I**

## **QUANTUM PHYSICS:**

Matter waves & its experimental verification. Wave. Group and particle velocity & their relation. Uncertainty principle with elementary proof & application to Microscope & Single slit. Characteristics and continuous X-rays. Duan Hunt limits. Moseley's law. Bragg's equation, Laws of diffraction Bragg's spectrometer. Compton Effect. Electron reflection. Bethe's Law. Electron gun. Working and application of CRT & CRD viz measurement of voltage, frequency and phase etc. Bainbridge mass spectrograph & Electron Microscope.

## **UNIT-II**

### **RAY & WAVE OPTICS:**

Cardinal points of a co-axial lens system Nodal slide experiment. Idea of Spherical & Chromatic aberration, coma, astigmatism and distortion Ramsden & Huygens's eye pieces and their cardinal points, Fresnel's biprism. Newton's rings and Michelson's Interferometer experiments. Diffraction at single slit, double slit and diffraction grating. Rayleigh criterion, resolving power of a telescope, microscope, grating and prism. Concept of polarized light, Brewster's laws, Double reflection, Nicol prism, quarter & half wave plates. Nuclear reactors, its site selection and working. Giger-Muller Counter, Mass spectrographs, Idea of cosmic rays.

## **UNIT -III**

### **NUCLEAR PHYSICS:**

Static properties and applications of nuclear model: Gamow, liquid drop and shell models, Linear Particle accelerator, Cyclotron, Synchrotron, Synchrocyclotron, and Betatron, differential cross section, chain reacting, critical size. Nuclear fusion & nuclear reactors, its site selection and working. Giger-Muller Counter, Mass spectrographs, Idea of cosmic rays.

## **UNIT -IV**

### **DIGITAL ELECTRONICS:**

Number system used in digital electronics: decimal, binary, octal, hexadecimal. Conversion of decimal to binary octal & hexadecimal & vice versa. Addition, subtraction, multiplication, division floating point numbers. Signed & unsigned numbers 2, 3 complement Boolean algebra. AND, OR, NOT, NOR, NAND, EX-NOR, EX-OR gates & their representation & truth table, laws of Boolean algebra, De Morgan theorem & Demorganization conversion of logic circuit from one type to Universal logic gates circuits.

## **UNIT -V**

### **DIELECTRICS:**

Dielectric constant, moment of charge distribution, potential field due to dipole Torque & force on a dipole in an external field. Work done in rotating a dipole. Dielectrics polarization, polar and non-polar dielectrics. Gauss's law, E, P and D vectors, Different type of polarization. Concept of internal fields Clausius-Mossotti relationship. Langevin theory of dipolar orientation. Ideal and loss dielectrics. Loss tangent and idea of complex permittivity.

### **LASER & FIBER OPTICS:**

Stimulated and spontaneous emission, active medium, population inversion, pumping Optical resonators, properties of Laser beam. Principles of Ruby, Nd YAG, He-Ne & Carbon dioxide Lasers and their engineering uses & applications.

### **Practical:**

- To determine moment of inertia of a Fly wheel about its own axis of rotation.
- To determine value of modulus of rigidity of the material of a given wire by a dynamical method using Maxwell Needle.
- To determine the restoring force per unit extension of a spiral spring by statically and dynamically method.
- To determine the frequency of an electrically maintained tuning fork by Melde's method.
- To determine the value of "g" by Kater's reversible pendulum bar pendulum.
- To determine the moment of inertia by inertia table.

- To determination the value of specific resistance of wire by post office box.

**References:**

1. A.T.B. of Optics by Brijlal and Subraminyan
2. Feynman Lectures on physics by R.P. Feynman R.B. Leighton, A- W Publications Massachusetts U.S.A.
3. Concepts of modern physics – A. Beiser- Mc Graw Hills, New York
4. Engineering Physics By M.N. Avadhanulu and P.G. Kshirsagar.
5. Engineering Physics By Gaur and Gupta
6. Atomic and Nuclear Physics by Brijlal and Subrammnyam
7. Electricity and Electronics by D.C. Tayal
8. Introduction of Atomic and Nuclear Physics- Harvey. E. White-east west press New Delhi
9. Elements of Modern Physics- S.H. Patel – Tata Mc Graw Hill New Delhi

## **Engineering Graphics (1+0+3)**

### **UNIT -I**

Scales: Representative fraction, plain scales, diagonal scales, scales of chords. Conic sections. Construction of ellipse, parabola and hyperbola by different methods. Normal and Tangent. Special Curves: Cycloidal, Epi-cycloid, Hypo-cycloid. Involute. Archimedean spiral and logarithmic spirals.

### **UNIT -II**

Projection points and lines, True inclinations and true length of straight lines, traces of straight lines. Auxiliary planes.

### **UNIT -III**

Projection of planes and solids: Projection of planes, Projection of polyhedral Pyramids. Cylinder Cone and Sphere.

### **UNIT -IV**

Section of solids: Section of right solids by normal and inclined planes. Development of Surfaces: Parallel line and radial – line method for right solids. Method of triangulation for oblique pyramids. Cones and transition pieces.

### **UNIT -V**

Intersection of Surfaces: Intersection of prisms. Pyramids, cylinder, cone, line method, cutting plane method.

Isometric Projection: Isometric scale, isometric axes, isometric projections of planes and solids.

**References:**

1. Engineering drawing – By N.D. Bhatt
2. Engineering drawing – By Venugopal
3. Engineering drawing – By Gufraal & Shende
4. Engineering drawing – By Laxminarain & Vaishwakar

## **Fundamental of Computers (2+0+0)**

### **UNIT -I**

History and Organization of computers, Data representation-Binary, Octal and Hexadecimal representation, Conversion do Decimal Binary, Octal and Hexadecimal and viveversa.Binary addition and subtraction by complimentary method.

### **UNIT -II**

Introduction to various types of input/output devices of a computer, Computer Memory: Introduction to RAM, ROM, PROM, EPROM, magnetic hard disk, floppy disk and magnetic tape drives.

### **UNIT -III**

Computer languages: Need of a programming language, low level and high level language, introduction to compiler and interpreters.

Operating System: Need of an operating System, Types-Batch O.S., Multiprogramming O.S., Time Sharing O.S., Online and real time O.S.

### **UNIT -IV**

Problems solving on computer, Algorithms and flow charts, Elements of BASIC, Control and Input-Output statement, subscripted variables.

### **UNIT -V**

Functions and subroutines, writing a simple computer programs in BASIC, Introduction to Disk Operating System-Its Internal and External Commands, Application packages-Wordstar, Lotus-123, Introduction to dBase III Plus (Assist mode)

### **References:**

1. Fundamental of Computer by P. K. Sinha
2. Fundamental of computer by V. Rajaraman

## **Workshop Practice (1+0+3)**

### **UNIT -I**

#### **BLACKSMITHY SHOP:**

Smithy forges, maintenance and control of fire and fuel used in smithy shop. Use of various smithy tools such as swage block. Anvil, Different types of Hammers, Tongs, Flatters, Cold set, Hot set, Hydraulic swates, fullers, set hammers punches, Drifts and rivet headers (rivet snaps) etc. Use of measuring rule. Callipers (outside and inside), Templates and gauges used in forging. Introduction to forging and forging cethods heating metals for forging.

Forging operations:

Upsetting, Drawing down, Fullering. Swaging, Platening, Cutting down, forge welding Punching and drafting

Three jobs to cover above course such as

Forging of chisel

Forging of C-Ring.

Forging of Pan Hook (S-shaped)

Forging of screw driver

Forging of hexagonal nut etc.

### **UNIT -II**

#### **CARPENTRY SHOP:**

Timber:

Type, Qualities of timber, disease, Timber grains, Structure of timber. Timber seasoning. Timber preservation, approximate conversion & Market forms of timber

Wood Working tools:

Timber:

: Wood working machinery, joints & joinery.

Various operations of planning using various carpentry planes swaing and marking of various carpentry joints.

Two jobs to cover above courses such as:

Carpentry joints such as cross halving joint, mortise and tennon joint, Dovetail joint etc.

Develiling plates. Wall bracket.

### **UNIT -III**

#### **FITTING SHOP:**

Metal Bench Work

Measuring instruments. Engineer steel rule. Surface gauges calliper. Hermaphrodite calliper (Jenny calliper). Height gauges. feeler gauges. Try square and micrometer. Use. Care and maintenance of hand tools such as hammer. Cold chisel of different type. Center punch Hack-saw. Dot punch. Drift. Different types of files. File cuts. File grades. Use of surface plate. Surface gauges type of drills. Taps and dies for drilling tapping and screw threads.

Fitting operations: Chipping filling. Drilling and tapping

Two joints to cover above course such as:

Preparation of job piece by making use of filling. Sawing and chipping operation.

Job having combined practice for drilling and tapping

Job having combined practice for drilling and reaning

### **UNIT -IV**

#### **FOUNDRY**

Pattern Making: Students are required to prepare four jobs related to pattern making and moulding and know about:

Pattern materials, pattern allowances and types of patterns

Core box and core print. Colour codes

Use and care of tools used for making wooden patterns

Moulding:

Properties of good moulding and core sand. Composition of green sand. Dry sand and loam sand.

Methods used to prepare simple green and bench and pit mould, dry sand bench mould using single piece and split patterns.

Care and use of moulding tools.

### **UNIT -V**

#### **WELDING:**

Students are required to make three jobs related to Brazing. Soldering and welding and to know about:

Equipment used for Branzing. Solering and gas arc welding

Selection of material and flux and pipe for gas welding

Selection of welding machine, Electrodes and current for Arc welding.

Use of tools and equipments. Safety precautions.

### **UNIT -VI**

#### **ADVANCE FITTING**

One composite job related to advance fitting covering knowledge about allowances and limits, Fits and tolerances.

Use and care of important precision tools used in fitting.

## **REFERENCES**

1. Manufacturing Processes – chapman Vol & II
2. Production Technology – P.N. Raw.
3. Workshop Technology – Raghuwanshi Vol & II
4. Workshop Practices – Hazara Choudhary. Vol. I & II
5. Production Technology – R.K. Jain.

## **Computer Programming I (0+0+3)**

### **UNIT -I**

#### **PRINCIPLES OF OBJECT – Oriented Programming**

Procedure – Oriented Programming vs. Object-Oriented Programming. Basic concepts of OOPs, Advantages of OOPs. Object Oriented Languages.

Beginning with C++

What C++, Structure of C++ program, is creating. Compiling, Linking. And Executing a C++ program.

### **UNIT -II**

Token. Expressions and Control Structures.

Tokens. Keywords. Identifiers. Basic Data Types, User- Defined Data Types Derived

Data Types, Symbolic Constants. Type Compatibility. Variable Declaration. Dynamic Initialization of Variables. Reference Variables. Operators in C++. Scope Resolution Operator. Memory. Management Operators, Manipulators, Type Cast Operators. Operator Overloading. Operator Precedence. Control Structures.

### **UNIT -III**

#### **FUNCTIONS IN C++**

Main function. Function Prototyping. Call by Reference vs. Call by Value. In-line Functions. Default Arguments. Constant Arguments. Function Overloading. Friend and Virtual Functions.

## **B.Tech. (Information Technology) II<sup>nd</sup> Sem Engineering Mathematics II 4 (3+1+0)**

### **UNIT -I**

Fourier series and Half range Fourier series. Fourier Integral.

Laplace transforms and their basic properties, Application on solution of ordinary differential equation.

### **UNIT -II**

Second order differential equation with variable Coefficient, Solution by series method with emphasis on Legendre's and Bessel's aquatic. Analytic function and conformal Transformation.

### **UNIT -III**

Linear and Non-Linear Partial differential equation of first and second order with constant coefficients, Separation of variable method. Application in solution of wave and heat conduction equation.

### **UNIT -IV**

Vector calculus, Vector Differentiation Divergence, Gradient and Curl, Vector Integration, gauss divergence and stoke's theorem.

### **UNIT -V**

Binomial, Normal and Poisson's distribution, Curve fitting Index number, Reliability or casting and decision theory.

#### **Books:**

1. Integral transform – By Vashishta & Gupta.
2. Laplace transform – By Spicel ( Schaum's Series)
3. Vector Calculus – By A.R. Vashishta
4. Higher Engg. Maths – By B.S. Grawal.

## **Material Science and Technology 4 (3+1+0)**

### **UNIT -I**

#### **ALLOYS AND HEAT TREATMENT:**

Alloys- Introduction, purpose of making alloys, Types-Ferrous alloys- stainless steel. Nickel steel, Vanadium steel, Non ferrous alloys - Aluminium, Copper, Nickel alloys, Heat treatment Introduction, Heat treatment processes, Annealing, Normalising, Hardening, Tempering, Case hardening, Surface hardening, Heat treatment furnaces, Heat treatment furnace atmosphere control, Pyrometry, Defects in the heat treatment of steel.

### **UNIT -II**

#### **PHASE RULE AND PHASE TRANSFORMATION:**

Introduction, definition of terms involved in phase rule, Thermodynamic derivation of phase rule. One component system, water system, General study of Eutectic system. Peritectic system, Ternary equilibrium Diagram, Allotropy of Iron, Iron carbon equilibrium Diagram.

### **UNIT -III**

#### **POWDER METALLURGY AND COMPOSITE MATERIALS:**

Powder Metallurgy, Introduction, Application, Advantages and Disadvantages, various steps involved in powder metallurgy. Tungsten wires, cemented carbides and metal bonded ceramics. Composites, materials- Laminates, Reinforced composites floor materials- Linoleum. Tiles and seamless floor finishes.

Applications of Plastics in Engineering and Industry.

### **UNIT -IV**

#### **CORROSION & PROTECTIVE COATINGS:**

Corrosion – Introduction. Factors, types of corrosion. Dry and Electrochemical corrosion & its mechanism.

Galvanic corrosion, specific types – Pitting, waterline, Intergranular, stress.

Microbiological corrosion, corrosion Fatigue, Erosion corrosion

Control and prevention of corrosion – Metallic and non – metallic coatings, Paints, Varnishes and Lacquers, cathode protection.

## **UNIT -V**

### **ELECTRON THEORY OF METALS, SUPERCONDUCTIVITY:**

Metallic Bonding, Drude and Lorentz theory, Sommerfield free electron theory, Electron energies in metal Brillions. Zone theory, Factors affecting electrical resistance of materials. Outline of BCC Theory. Suprconductivity and superfluidity, General features of cuprate super conductors. Electron super conductors, copper-free oxide super conductors preparation of cuprate materials. Applications of superconductors.

Structure of Metals – Bonds in Solids, space lattices, symmetries space points and space groups, crystal systems and crystal structure of metals. Miller indices, Miller Bravis indices, Crystallization of metals, grains and Grain boundaries, Crystal defects.

#### **Books:**

1. Materials cience – Narula & Gupta, Tata Mc Graw Hill
2. Super conductivity today – Rama Krishnan & CNR Rao, Universities Press
3. Chemistry of Engineering Materials- C. V. Agrawal, Tara Book agency
4. Silid State Physics – Kittle
5. Solid State Physics – Seitz

## **Sub: Basic Mechanical Engineering 6 (3+1+2)**

## **UNIT -I**

### **WORKSHOP TECHNOLOGY:**

Materials of Construction

Classification of Engineering materials, Composition, Mechanical properties and uses of cast iron, mild steel, high carbon steel and high speed steel.

Foundry Practice:

Introduction, Pattern, Pattern materials like wood, metals, plastics etc. Types of pattern like solid, split, match plate, gated and sweep, pattern allowances, Mould materials, Properties of a good molding sand. Composition of green sand, dry sand, loam sand. Types of mould gating system. Core, Core materials, properties of good core materials, core preparation.

## **UNIT -II**

### **WELDING PRACTICE:**

Gas Welding Method of preparation and accumulation of oxygen and acetylene. Equipment's used in high pressure and low pressure gas welding plant. Function of flux. Types of gas flames Arc welding various methods of producing are Ate welding equipment's comparison between AC and DC welding ARC welding electrodes. Flux coating on welding electrodes.

## **UNIT -III**

### **MEASUREMENT, MEASURING TOOLS AND MACHINE TOOLS:**

Construction, care & uses of surface plate, Straight edge, Vernier calliper, Micrometer, Dial gauge, Slip gauge, Sine bar and Combination set.

Description, definition, specification of machine tools, working, classification and specification of Lathe and drilling machine.

## **UNIT -IV**

### **HEAT ENGINES:**



## **Boilers**

Names and functions of principle parts, classification, Boiler mountings and accessories, Draught-natural and artificial, Height of chimney, Equivalent evaporation and boiler performance.

## **Steam**

Sensible heat, latent heat, super heat, internal energy, enthalpy, dryness fraction and its determination, steam processes at constant pressure, constant volume, and constant enthalpy.

## **UNIT -V**

### **STEAM ENGINES**

Description and working, hypothetical and actual indicator diagram, diagram factor, H.P. developed and efficiencies e.g. mechanical efficiency, brake thermal efficiency and indicated Thermal efficiency, governing, cut off and throttles compound engines (Description and working only).

### **I.C. ENGINES**

Description and working of four stroke petrol engines, two stroke petrol engines, four stroke diesel engines and two stroke diesel engines, relative merits and demerits

### **Practical:**

- To study of foundry shop
- To study of dial gauge
- To study of Combination set
- To study of gas welding
- To study of lathe machine
- To study of drilling machine
- To study of boiler and its mountings and accessories
- To study of IC engines and its system
- To perform spark test
- To perform sieve analysis

### **Books:**

1. Workshop practice Raghuvanshi
2. Workshop practice Hazra & chaudhary
- 3 Foundry Technology Sinha & Goel (Rastogi Publication)
4. Heat engines P.L. Sallaney
5. Heat engineering Kumar & Vasandani (Metropolitan Book Company)

## **Engineering Chemistry 6 (3+1+2)**

## **UNIT -I**

### **WATER ANALYSIS & TREATMENT:**

Sources, Impurities, Hardness & its units. Industrial water requirement & characteristics, softening of water by various methods (L.S. Zeolite, ion exchange resin) boiler trouble (carry over, scale and sludge, caustic embitterment) Boiler corrosion causes, effect & remedies, internal treatment to boiler feed water, Characteristics of municipal water & its treatment, water analysis (determination of alkalinity, temporary and permanent hardness by complexometry, D.O, B.O.D, C.O.D, Chlorides, Sulphates, dissolved CO<sub>2</sub> & residual chlorine. T.D.S) Numerical problems based on water analysis and water softening processes.

## **UNIT -II**

### **FUELS & COMBUSTION:**

Fossil fuels & classification. Calorific value & its determination by Bomb Calorimeter & its numerical. Proximate and Ultimate analysis of coal and their significance, calorific value Computation based on utilization analysis data. Ranking of solid fuel. Carbonization. Manufacturing of coke & recovery of by products petrochemicals derived from alkenes, alkenes, alkenes, benzene & its homologues. Cracking of higher Hydrocarbons & mechanism of cracking. Knocking, relationship between knocking & structure of hydrocarbon, improvement of anti knocking characteristics of IC engine fuels. Diesel engine fuels. Cetane number, flue gas analysis, combustion and it related numerical problems.

## **UNIT -III**

### **LUBRICANTS**

Introduction, Mechanism of lubrication, Classification of lubricant, Lubricating oils, grease & semisolid lubricant, solid lubricant, synthetic lubricant, properties and Testing of lubricating oils (Viscosity & Viscosity index, flash and fire points, cloud and pour point, Anline value, Steam Emulsion Number, Neutralization no, Saponification Value. Iodine. Iodine value, carbon residue) Numerical problems based on Viscosity Index.

## **UNIT -IV**

### **POLYMER**

(Fibers, Rubbers & Elastomers, Plastics). Introduction. Classification. Types of Polymerization, reaction mechanism. Fibers-Cellulose & synthetic Nylon Decoran, polyvinyl, Polyacrylates their manufacture & flow sheet diagram. Rubber-Natural rubber, Isolation from latex. Vulcanization & its mechanism cis-trans rubbers.

Elastomers: Styrene rubber (GR-S) and Vitriole rubber (GR-A), Neoprene, Buty I rubber, thiocols, Ployurethanes, Plastic- Plastic- Classification. Thermoplastic & Thermosetting plastics, manufacturing of Polythene, PVC, PVA, polyacrylates, Acrylonitrils, phenol formaldehyde resins, urea formaldehyde resin & glyptals, silicone resin & its flow sheet diagrams

## **UNIT -V**

### **CEMENT AND REFRACTORIES**

Classification of Cements, 1.5.1. Specifications, Composition & Manufacture of portland Cements. Setting & Harding of lime mortar, plaster of paris, Magnesium oxy chloride. Decay of Cements. Refractries. Refractories- Definition, classification. Properties & uses of silica bricks, Fire clay, Dolomite, Magnesite, Carborundum, Chromite bricks.

### **INSTRUMENTAL TECHNIQUES IN CHEMICAL ANALYSIS:**

Introduction, Infra red. Ultraviolet, Nuclear Magnetic Resonance spectrophotometry, Chromatography – Gas chromatography, Colorimetry, Lambert's and Beer's Law.

## **Practical**

**NOTE:** At least 10 of the following experiments be performed during the session.

### **1. Water Testing**

- (i) Determination of Total hardness by Complexometric, titration Method.
- (ii) Determination of mixed aldalinity (a) OH & Co3 \_ (b) CO3 \_& HCO3
- (iii) Chloride ion estimation by Argentometric method.

### **2. Fuels & lubricant testing**

#### **(i) Flash & fire point's determination by**

- (a) Pensky Martin Apparatus (b) Abel's Apparatus
- (c) Cleveland's open cup Apparatus

**(ii) Miscosity and Visocosity index Determination by**

- (a) Redwood viscometer No. 1
- (b) Redwood viscometer No. 2

**(iii) Proximate analysis of coal**

- (a) Moisture content
- (b) Volatile matter content
- (c) Ash content
- (d) Carbon residue

**(iv) Stem emulsification No & - Aniline point determination**

**(v) Cloud's and power point determination of lubricating oil**

**3. Alloy Analysis**

- (i) Determination of percentage of Fe in an iron alloy by redox titration using N – Phenyl anthranilic acid as internal indicator.
- (ii) Determination of Cu and or Cr in alloys by iodometric Titration

**Books**

1. Chemistry in Engineering & Technology – Vol II Kuriacose & Rajaram Tata Mc. Graw.
2. A Text Book of Engineering Chemistry – S.S. Dara.
3. Chemistry for Environmental Engineering – Sawyer, Mc Carty and Parkin- Mc Graw Hill International
4. Engineering Chemistry – Gopalan Venkappayya.
5. Applied Chemistry – N.Krishnamurthy. jayasubramaniam.
6. Engineering Chemistry – B.K. Sharma
7. Applied Chemistry Theory and Practice, O.P. Viremani. A.D. Narula New

**Engineering Mechanics 6 (3+1+2)**

**UNIT -I**

**STATICS**

Concurrent, Non concurrent and parallel forces in a plane, Composition, resolution of forces, Free body diagrams, Moment of a force and Varignon's theorem, Conditions of Equilibrium, Polygon of Forces and Funicular Polygon of Forces, Principle of Virtual work, Equivalent Force System.

**TRUSSES**

Analysis of forces in the members of a truss. Method of joints, Method of sections. Graphical Method for Perfect Trusses.

**UNIT -II**

**CENTROID & MOMENT OF INERTIA**

Location of centroid and Moment of Inertia of plane areas, Perpendicular Axis and Parallel Axis theorems. Product of Inertia, Principal Axes and Principal Moment of solid bodies.

**FRICTION**

Coloumb's law of friction. Friction on inclined plains. Screw and Nut friction. Ladder and wedge friction, Friction in journal collar bearings. Uniform pressure and uniform wear, Lifting machines.

**UNIT -III****TRANSMISSION OF POWER**

Transmission of power through Belt, Rope and Gears, Ratio and tension on tight side and slack sides. Centrifugal tension, Spur, Bevel .Worm gearing. Rack and Pinion gear, Gear Trains. Epicyclic Gear Train.

**UNIT -IV****KINEMATICS**

Kinematics in cartesian and polar coordinates, Particle under uniform and non-uniform acceleration. Tangential and normal acceleration, Radial and Transverse velocity and acceleration, motion under gravity.

**UNIT -V****KINETICS**

Kinetics of particle, motion under constant force, momentum and energy principle, Impulses and angular momentum, D' Alemberts principle, Motion under constant force. Flywheel, Collision of Elastic Bodies, Shear force, and Bending moment Diagram in Cantilever and Simply Supported beam with concentrated, Distributed load, and couple, Overhanging beams, Point of Contraflexure, Relationship between bending moment and shear force pure bending.

**Practical:**

1. To determine moment of inertia of a flywheel about its own axis of rotation.
2. To study the variation of time period (T) with length (l) for a compound pendulum and then to determine –
  1. The value of acceleration due to gravity.
  2. The position of center of gravity of the bar.
  3. The radius of gyration (k) of the bar about an axis passing through C.G. and perpendicular to its length.
3. To determine value of modulus of rigidity of the material by dynamical method using Maxwell's needle
4. To determine the movement of an irregular body about an axis passing through its center of gravity and perpendicular to its plane by dynamical method of inertia table.

**Books:**

1. Engineering Mechanics by R. S. Khurmi S. Chand Publication
2. Engineering Mechanics by S. B. Junarkar
3. Strength of Material and Engineering Mechanics by S. B. Prasad

**Computer Programming -II 4 (0+0+4)****UNIT -I****INTRODUCTION**

How Windows Works, MS Windows, Various features, Advantages, How Windows program works, The Structure of Windows Program, Code and Resources, Program

Instances, Compiling a Windows Program, Windows Memory Management – Memory options, stacks and heaps. Setting up Your System: Hardware and Software Requirement. Installation and setup options.

#### **FIRST PROGRAMMING EXPERIMENTS**

Hungarian Notation. A Minimal Windows Program Structure, the Windows. H file, Win Main O function, creating a new Windows class, Message Loop.

#### **UNIT -II**

##### **MENUS**

Operating Menus, Menus Defined as Resource Data, Popup Menu, creating a Menu as program operates, Menu Functions, The System Menu.

**MOUSE HANDLING:** Mouse Shape. The Caret

#### **UNIT -III**

##### **TEXT AND GRAPHICS OUTPUT**

Character Mode versus Graphics Mode, The Device Context, Windows GDI, Text Output, The WM\_PAINT Message, Changing the Device Context, Graphics Output, Animated Graphics using Peek Message O Loop, Graphics Objects like Pen, Brush. Character Sets, Fonts, and the Keyboard.

The ANSI Character Set, Keyboard Message Processing, System Key Messages and Dead.

Characters, Selecting a Stock Font, Keyboard Accelerators.

#### **UNIT -IV**

##### **WINDOWS CONTROLS**

Types of Windows Controls Static, Button, List Boxes, Combo Boxes, Scroll Bars, Edit, Controls and their use in windows programs.

#### **UNIT -V**

##### **CHILD AND POPUP WINDOWS**

Creating a Child Window, Sending Messages to Child Windows. Fixed Child windows, Popup Windows. Dialog Boxes, How Dialog Boxes work, Designing a Dialog Box, Using a Dialog Box, Exchanging Data with a Dialog Box, Modal, Modeless, and System Modal Dialog Boxes.

#### **UNIT -VI**

**OTHER RESOURCES:** String Tables, User-Defined Resources Managing Memory: Local vs. Global Memory. Using Fixed and Discard able Memory Blocks. Global Memory Allocation.

#### **UNIT -VII**

##### **PRINTING**

How Windows Support Printers. Printer Device Context Sending Special Commands to a Printer, Scaling the Printer Output. Allowing Interruption of a Print Job, Getting Information. About A Device, Calling functions in the Printer Driver. Dist File Access: How Windows Access Disk Files, Various Operations like Create, Open, Read, Write, Close etc.

#### **UNIT -VIII**

##### **BITMAPS**

How Bitmaps Store Images, Loading and Displaying a Bitmap, BITMAP Data Format, DIB Format. Dynamic Link Libraries: Compiler Runtime Libraries. Dynamic Link Libraries, Writing a DLL, Using DLL, Alternate Ways to Reference DLL Functions

##### **Practical**

Windows API programs based on course contents.

(At least two program from each unit).

##### **Books**

1. Windows programming Printer Plus – By Jim Conger 1999, Galgotia Pub.
2. Windows API Bible : By James L Conger, Galgotia

**B.Tech. (Information Technology) III<sup>rd</sup> Sem**  
**Mathematics III 4(3+1+0)**

**UNIT -I**

**FUNCTIONS OF COMPLEX VARIABLES**

Analytic function, Harmonic conjugate, Cauchy – Riemann Equations, Line integral, Cauchy's theorem, Cauchy's integral formula, singular points, poles and residues, residues theorem, evaluation of real integral, bilinear transformation.

**UNIT -II**

**NUMERICAL ANALYSIS**

Different operators, errors and approximations, interpolation, inverse interpolation, method of least squares, numerical differentiation and integration, Newton-Raphson method of solving polynomials.

**UNIT -III**

Solutions of algebraic and transcendental equations. Solutions of simultaneous algebraic equations, solutions of ordinary differential equations and partial differential equations.

**UNIT -IV**

**LINEAR ALGEBRA**

Simultaneous linear equations, matrices, vector space and subspaces, bases and dimension, Linear transformations and their matrix representations, change of basis.

**UNIT -V**

Eigen values and Eigen vectors, Cayley-Hamilton theorem, diagonalizable operators, Quadratic forms and their diagonalization, bilinear forms. Hermitian forms, definite and semi-definite forms.

**Books:**

1. Engineering maths part 2 & 3, D.S. Chandrasekharaiah, Prism Books Pvt. Ltd., 1999.
2. Advanced Engineering mathematics, E. Kveyszig – Wiley Eastern Ltd.
3. Numerical analysis by Ralph J. Stanton.
4. Engineering mathematics by Lazpatorry

**Energy Ecology Environment & Society 4(3+1+0)**

**UNIT -I**

Introduction of energy scenario, conventional and non-conventional resources of energy, utility and waste management of thermal, hydra energy. General idea of solar, winds, bio-mass, geothermal, tidal and wave energy, sources and waste management of nuclear power energy. Electromagnetic energy, radio frequency and microwaves, its biological effects.

**UNIT -II**

Global warming, depletion of ozone layer, human activity and meteorology, genetic and plant bio-diversity, EL-Nino phenomenon and its effects. Solid waste, waste disposal methods, recycling of solid waste and its management.

**UNIT -III**

Atmosphere – introduction, structure of the atmosphere, chemical and photochemical reactions in the atmosphere, primary air pollutants – sources, control and harmful effects of CO, NO<sub>x</sub>, SO<sub>x</sub>, HC, particulates, sampling techniques, air pollution from automobiles, photochemical smog, acid rain some case studies of

Air pollution.

#### **UNIT -IV**

Hydrosphere – Aquatic environment, organic and inorganic water pollutants, domestic and industrial waste treatment, aerobic and anaerobic treatment processes, sampling and preservation, some case studies of water pollution.

#### **UNIT -V**

Lithosphere and noise pollution – introduction of land soil pollution, control and disposal, harmful effects.

General introduction of noise pollution and its effects. Sound unwanted form of noise, changes, and traffic noise. Prediction and control.

#### **Books:**

1. Environmental Engineering –Howard
2. Environmental protection- Emil T. Chanlett.
3. Environmental chemistry – A.K. Dey. Wiley Eastern Ltd.
4. Environmental science – Cumingham, Saigo, Mc.Graw Hill.
5. Ecology concepts and application- Manuel C. Mmoller, Jr. Mc. Graw Hill.
6. Environmental chemistry and pollution control – S.S. Dora,

### **Instrumentation and Measurement 6(3+1+2)**

#### **UNIT 1**

Measurement and error, accuracy and precision sensitivity resolution, types of errors, electronic voltmeter, AC voltmeter with rectifier and amplifier combination electronic millimeters, DC ammeter, AC current indicating instruments, AC probes, CROs, single trace and dual beam, CROS.

#### **UNIT 2**

Measurement of inductance, capacitance and Q of the coil, Maxwell's, bridge, Wines Bridge, sharing bridge. Whether earring, evictor impedance medley transducers classification of transducers, strain, gauge, displacement transducers, linear variable differential transducers (LVDT), photoelectric transducers, temperature measurements, thermocouples, photosensitive device, nuclear radiation detection instruments.

#### **UNIT 3**

Signal generator function generator, sweep frequency generator, pulse and square wave generator, wave analyzers, harmonic distortion analyzer, spectrum analyzer, heterodyne frequency, meter frequency counter, measurement errors, automatics and computation counter

#### **UNIT 4**

Digital instruments Advantages of digital instruments, Over analog instruments, D-A, A-D Conversion Digital voltmeter, ramp type DVM, Integrating DVM, successive approximation DVM, Displays ( LED, LCD AND Seven segment etc.), Instruments used in computer controlled instrumentation, RS232 and IEEE 488, GPIB electrical interface, interfacing transducers to electronic control.

#### **UNIT 5**

Microwave instruments, scattering parameters, Transmission and reflection parameters, Network analyzer, Measurements uncertainty measurement with scalar and vector network, Analyzers microwave power measurement – sources and detectors, Fiber optic power measurement, stabilized calibrated light.

#### **PRACTICAL**

- To study the concept of CRO.
- To study the multimeter and component testing.
- Measurement of unknown inductance with the help of Maxwell's inductance capacitance bridge.
- Measurement of unknown inductance with the help of Ownes Bridge.

- To measure the value of unknown capacitance with the help of desauty bridge.
- To express the characteristics of strain gauge.
- To measure the intensity of light source with the help of following photo transducers.

1. Photo voltaic cell 2. Photo diode 3. Photo Transistor 4. LDR

## **BOOKS**

1. Instrumentation and Measurement by A.K. Sawhney

## **Sub: Digital Electronics and Microprocessor 6(3+1+2)**

### **UNIT 1**

Design of asynchronous and synchronous counter-modulo-n, up, down and up/down counters, left, right and left/right shift registers.

MST and PLD binary adder & subtractor, decimal adder, magnitude comparator, Decoders and encoders, multiplexers, ROM, memory reference addressing.

### **UNIT 2**

#### **SEQUENTIAL MACHINES**

Analysis of clocked-mode sequential machines – state reduction and assignment, and design procedure. Asynchronous sequential logic - Analysis and design procedure, reduction of state and flow table, race-free state assignment Hazards.

### **UNIT -III**

Fault diagnosis & Tolerance – classes and models, diagnosis and testing.

### **UNIT -IV**

**MICROPROCESSORS (8085)** – Internal architecture, Instruction set and its classification, counters delays, stacks and subroutines, minimum configuration memory – mapping and its interfacing, assembly level programming.

### **UNIT –V**

**EXTENDING CONFIGURATION** - Programmable peripheral interface, Programmable interval timer, Programmable interrupt controller, Keyboard & display interface, DMA controller, USART. Introduce on to higher-level Microprocessor.

## **PRACTICAL**

- Write a program to add two 8 bit numbers.
- Write a program to find 1's complement of a 16 bit number.
- Write a program to shift a 16 bit number left by 2 bits.
- Write a program to shift a 16 bit number right by 2 bits.
- Write a program to find the largest number in a data array.
- Write a program to find sum of a series of 8 bit numbers.
- Write a program to find square root of a number.
- Write a program to find the square root of a number from look up table.
- Write a program to find 2's complement of a 16 bit number.

## **BOOKS**

1. Digital design, digital logic and computer design, by M.Morris Mano, PHI.
2. Microprocessor arch. Programming and application with 8085 by R.S. Gaonkar
3. Digital computer electronics by A.P. Malwino and J.N.Brown, TMH, 3/e
4. 8080 to 8085 Introduction to microprocessor by P.K.Ghosh & P.R. Shridhar, PHI, 2/e

## **Object Oriented Programming and Methodology 6(3+1+2)**



## **UNIT -I**

Objects, objects as software modules, objects interaction, classes, method lookup, Hierarchies of classes, Inheritance, Polymorphism, Abstract classes.

## **UNIT -II**

Identifying objects and classes, representation of objects, Association between objects, aggregate components of objects.

## **UNIT -III**

Object oriented programming languages, class declaration, object declaration, Mandatory profiles, message sending, Association, recursive association, many to many association, Argument passing.

## **UNIT -III**

Inherited methods, redefined methods, the protected interface, abstract base classes, public and protected properties, private operations, disinheritance, multiple inheritance.

## **UNIT -IV**

Study of C++ as object oriented programming language.

### **Practical:**

- Programs to implement class and object.
- Programs to implement the various types of inheritance.
- Programs to implement the concept of function overloading and operator overloading.
- Programs to implement the concept of polymorphism.
- Programs to implement the concept of abstract class.

### **Books:**

- 1 Object oriented programming in C++ by Robert Lafore.
- 2 Object oriented programming with C++ by David parsons.
- 3 Object oriented design with C++ by Ken Barclay.

## **Computer Programming III 4(0+0+4)**

### **Section A: VISUAL C++**

## **UNIT -I**

### **VISUAL C++ BASICS**

Introduction, Building a application, Using Microsoft Foundation Class (MFC) Library, Visual C++ resources: Application Wizard, Accelerators and Menus, Toolbars.

## **UNIT -II**

### **VISUAL C++ AND DATABASE MANAGEMENT**

Data Access Object (DAO) versus open Database Connectivity (ODBC), Database Building Overview, Building a Database Application Using ODBC, Building a Database Application Using DAO.

## **UNIT -III**

### **VISUAL C++ AND INTERNET**

Designing Web Page, An Overview of JavaScript, Creating and ActiveX control, Creating an ActiveX Document Application, Using URLs and Monikers, working with Internet Information Server (IIS), Designing with security in mind, Building a Help File, packaging Your Application.

### **SECTION B: VISUAL BASIC**

## **UNIT -IV**

### **INTRODUCTION**

Creating first VB Application, Adding controls, Activation controls, creating menus, VB program structure, Handling data, Fundamental Expressions, Working with Interactive Keyboard and screen 110, adding loops, using arrays, procedures.

#### **UNIT 5V**

##### **INTERMEDIATE VB PROGRAMMING**

VB forms, Dialog boxes, Additional controls, printing with VB, Understanding objects and using object browser, Accessing file, Adding OLE to a program.

#### **UNIT -VI**

##### **ADDING POWER TO VB PROGRAMS**

Using graphics and Multimedia, using form Template, accessing database, using keyboard and mouse I/O, Building Help Subsystem, using activeX, adding Internet access to the applications.

#### **BOOKS**

1. Mastering Visual Basic 6 by Evangelos Petroustos, BPB Publication
2. Visual Basic 6 by Peter Norton, BPB Publication
3. Mastering Visual C++ by Michael J. Young, BPB Publication

### **Information Theory and Coding 6(3+1+2)**

#### **UNIT -I**

Uncertainty, Information And Entropy Information Measures

Characteristics on information measures, Shannon's concept of information, Shannon's measure of information, model for source coding theorem.

**COMMUNICATION SYSTEM:** source coding and line / channel coding, channel mutual information capacity (Bandwidth).

#### **UNIT -II**

Channel coding, theorem for discrete memory less channel, information capacity theorem:

Error detecting and error correcting codes, types of codes: block codes tree codes hamming and lee metrics, description of linear block codes by matrices, description of linear tree codes by matrices parity check codes, parity check polynomials.

#### **UNIT -III**

##### **COMPRESSION:**

Lossless and lossy, Huffman codes, Binary image compression schemes, Run length encoding, CCITT group 3 1D compression, CCITT group 3 2D compression, CCITT group 4 2D compression.

#### **UNIT -IV**

**VIDEO IMAGE COMPRESSION:** Requirement of full motion video compression, CITT H 261 video coding algorithm, MPEG compression methodology. MPEG-2 compression, Audio (speech) compression.

#### **UNIT -V**

**CRYPTOGRAPHY:** encryption, decryption, cryptogram (cyphertext).concept of cipher, crypto analysis.

**KEYS:** single keys (secret key) cryptography, two-key (public-key) cryptography. Single key cryptography.

**CIPHERS:** Block cipher codes, stream ciphers requirement of secrecy, the data encryption standard.

**PUBLIC KEY CRYPTOGRAPHY:** Diffie-hellman public key distribution, the Rivest-shamir-Adelman(R- CCITT group 3 1D compression S-A) system for public key cryptography. Digital signature.

### **PRACTICAL**

1. To study of analogue signal sampling and sample hold and its reconstruction using low pass filter.
2. To construct amplitude modulation and observe amplitude modulation wave.
3. How the msg signal can be form an frequency modulated by using phase locked loop.
4. To study of frequency modulation and construction of frequency modulated signal generated and observe its wave form.
5. To demonstrate new message signal can be referred from an amplitude modulated carries by using diodes detector.
6. Data coding techniques for NRZ format.
7. To study of 4- chanel TDM using pulse amplitude modulation.

### **BOOKS**

1. Electronics Communication by George Kannedy
2. Digital Communication by Carlson
3. Electronics Communication by J. K. Methol

## **B.Tech. (Information Technology) IV<sup>th</sup> Sem Analog and Digital Communication 6(3+1+2)**

### **UNIT -I**

#### **SIGNALS AND ITS REPRESENTATION**

Review of Fourier transform, convention, signal transmission though linear system, signal distortion in transmission poley wiener criteria, bandwidth and rise time, energy and power signals, spectral density and persevals theorem for energy of power signals, Hilbert transform representation of band pass signal. Linear modulation: definition, necessity of modulation, principle of amplitude modulation ,generation and detection of AM, sidebands, the generation and detection of side bands, comparison of various AM systems, FDM, synchronous detection.

### **UNIT -II**

#### **EXPONENTIAL MODULATION**

Definitions and relationship between PM and FM frequency deviation, Bessel's function, spectrum and transmission BW of FM signals, NBFM, WBFM, phaser diagram of FM signal, multitone FM, generation and detection of FM non linear effects in FM systems comparison of AM and FM systems, TDM.

Radio transmitter and receivers: Different types of AM and FM transmitter and receivers, AM and FM standard broadcast transmitter and receivers, image rejection, mixer.

### **UNIT -III**

**NOISE:** classification and source of noise, noise calculation for single and cascade stages, SNR,SNR in DSB, SSB, VSB, AM and FM systems, pre-emphasis and de-emphasis.

Sampling theorem, quantization, PCM, Commanding intesymbol interface, Eye patterns, delta modulation, adaptive delta modulation, DPCM, S/N performance of PCM and delta modulation, bandwidth of PCM and delta modulation.

### **UNIT -IV**

ASK, BPSK, QPSK, M-ray PSK, DPSK, BFSK, M-ray FSK, duo binary signaling base band signal receiver, probability of error, optimum filter, matched filter, Coherent and non coherent detection, bit error rate.

Random signals, random variables and processes, cumulative distribution function, probability density function, average value, variance, standard deviation moment and moment generating function,

characteristics function, Tchebycheffs inequality, Binary, Poisson and Gaussian distributions, other distributions, central limit theorem.

## **UNIT -V**

Unit of information, average information, joint and conditional entropy, mutual information, channel capacity efficiency, BSS and BEC, Shannon's theorem, Shannon's- Hartely theorem, bandwidth-S/N ratio trade off.

Coding separable codes, Prefix property, coding efficiency, Source coding, Shannon's-Fano code, Huffman code, error connection codes, FEC and ARQ, Hamming distance, Minimum distance, channel coding, Block code, Cyclic code, Convolutional code.

### **Practical:**

- Study of amplitude modulation and determinations of modulation index.
- Design AM generator and its implementation
- Design of AM detector and its implementation
- Study of FM
- Design of FM generator and its implementation
- Study of Waveform synthesizer
- Verification of sampling theorem
- Time division multiplexing
- Study of PCM System
- Study of DM System
- Study of ASK System
- Study of BPSK System
- Study of DPSK System
- Study of BFSK System

### **Books:**

1. Communication system – S Hykinl
2. Principle of communication – Taub& schilling
3. Communication system – B.P.Lathi

## **Data Structures and Algorithms 6(3+1+2)**

### **UNIT -I**

Structural Programming, top-down design, abstract data type, implementation of arrays,triangular arrays, structures, character strings, Pointers dynamic memory management.

### **UNIT -II**

Singly linked list, implementation linked list using arrays, implementation linked list using dynamic memory allocation circular link list, Josphus problem, doubly linked list, polynomial manipulation using linked list, representation of sparse matrices.

Stacks-their concepts and implementation, multiple stacks.Conversion of infix to postfix notation using stack, evaluation of postfix expression, recursion, how recursion-works, queues their concepts and implementation, deque, primary queues, simulation.

### **UNIT -III**

Trees, Binary tree-their representation and operations, tree traversals, threaded binary trees, conversion of general trees of binary trees, binary expression tree, applications oftrees sequential searching, binary search , height balanced tree and weight balanced trees, multiway search trees,digital search, trees, hashing and collision-resolution techniques.

### **UNIT -IV**

Various sorting algorithms viz. Bubble sort, selection sort, inserted sort, Quicksort, merge sort, address calculation sort and heap sort, complexity of the algorithm.

#### **UNIT -V**

Graphs, terminology, representation of graphs, reachability, minimum path problem, critical events, graph traversals, spanning trees, applications of graph.

#### **Practical:**

- Classes teaching with more emphasis on problems and algorithms to give a better understanding of subject.
- Programs implement stacks, queues, trees and graphs.
- Programs to solve josephus problem, simulation, polynomial manipulation.
- Programs to implement various searching and sorting techniques.

#### **Books:**

1. Data Structures using C by Tannenballam
2. Data Structures by TrembleySorenson
3. Data Structures using C by Rajiv Jindal

## **Computer Architecture & Organization 6(3+1+2)**

#### **UNIT -I**

Introduction to digital computer, Von Neumann model-CPU, memory, I/O, system bus, program execution, instruction and data prefetcher, multilevel M/C architecture, concept of interpreters and translators, hardware, software & firmware, scalable architecture.

Number systems- binary, octal, hexadecimal number system. Integer & floating point representation and arithmetic, alphanumeric codes, BCD code, gray code.

#### **UNIT -II**

Processor design- Instruction design- types – data transfer and manipulation, PSW and program flow control instruction for stack manipulation, Formats- opcode and operands, addressing modes. Control of CPU, hard wired control, wired control microprogrammed control, RISC & CISC.

#### **UNIT -III**

Memory organization-characteristics of Memory- ROM, RAM, memory technologies- static and dynamic RAM, memory address mapping, memory hierarchy, virtual memory, associative memory, cache memory-cache organization & management, auxiliary storage devices.

#### **UNIT -IV**

Input Output organization –I/O devices & interfaces, asynchronous data transfer, DMA, program and interrupt driven I/O, software and hardware interrupts, ISR, priority interrupts, IOP.

#### **UNIT -V**

Introduction to parallel processing, general pipelines, instructions and arithmetic pipelines, instruction perfect, branch handling, data burreing, Internal forwarding and register tagging.

#### **Practical:**

- To study of multimeters (Digital and Analog).
- To study of various types of electronic components and measurement by meter.

- To study of various types of mother boards.
- To study of interfacing cables.
- To study of SMPS power supply.
- To study of floppy disk drives (1.44 MB and 1.2 MB)
- To study of hard disk drives.
- To study of various types of keyboards.
- To study of various types of input output cards.
- To study of monitors (B/W and coloured)
- To calculate the internal Ohm's value of carbon resistance.

**Books:**

1. Structured Computer Organization, Andrew S. Tanenbaum, PHI, 3/e
2. Computer System Architecture, M.Morris Mano PHI 3/e
3. Computer Organization and Architecture, Williams Stallings PHI, 4/e
4. Computer Architecture & Organization, John P.Hayes, Mc Graw Hill Int.,2/e

## **Discrete Structure      4(3+1+0)**

### **UNIT -I**

Introduction, sets, finite and infinite sets uncountable infinite sets, mathematical induction, principles of inclusion and exclusion and multisets.

Relations and functions, a relational model for data bases, properties of binary relations, equivalence relations and partitions partial ordering relations and lattices chains and antichains, A job scheduling problem functions and pigeonhole principle.

### **UNIT -II**

Propositional logic, conjunction, disjunctions and negations interpretation of formulas in propositional logic, validity and consistency, normal form in propositional logic and logic consequences, introduction to finite state machines, finite state machines as models of physical system equivalence machines, finite state machines as models of physical system equivalence machine, finite state machines as language recognizers.

### **UNIT -III**

Introduction and basic terminology of graphs, planner graphs, multigraphs and weighted graphs, shortest path in weighted graph, introduction to eulerian paths and circuits, Hamiltonian paths and circuits, introduction to trees, rooted trees, path length in rooted trees prefix codes spanning trees and cut trees.

### **UNIT -IV**

Introduction to discrete numeric functions and generating functions, manipulation of numeric functions, generating functions, introduction to combinational problems, introduction to recurrence relations and recursive algorithms linear recurrence relations with constant coefficient, homogeneous solutions, particular solutions, total solutions.

### **UNIT -V**

Introduction to groups and rings, subgroup generations and evaluation of power, cosets and Lagrange's theorem, codes and group codes, isomorphism and automorphism, homomorphism and normal sub groups, rings, integral domains and fields.

**Books:**

1. Elements of Discrete mathematics C.L.Liu

## **Computer Programming IV 4(0+0+4)**

### **Section A: UNIX**

#### **UNIT -I**

UNIX overview:

UNIX features, the kernel, the shell File system:

Directory system, login directory, in code-user identification, permission bits, files sharing.

#### **UNIT -II**

Process management:

Scheduling, interprocess communication, UNIX signals, pipes and filters, multithread execution, Timers.

Memory Management

Swapping in real-storage UNIX systems, address, mapping in a virtual storage UNIX system, paging, swapping in virtual storage UNIX systems, dynamic storage allocation.

#### **UNIT -III**

The input/output system

Devices, descriptors, I/O system calls, Non-blocking I/O

#### **UNIT 4-IV**

Working with C-UNIX

System calls and UNIX library functions, UNIX-C interfaces, working with UNIX C files and graphics, UNIX program development: cc, make, and applications, UNIX Tools: grep, sed, TX, awk.

### **Section B: LINUX**

#### **UNIT -V**

Installing Linux

Overview of features, Linux hardware requirements, partitioning hard drive, installing Linux, installing Red Hat, Running Linux applications

System administration

Understanding System administration, Booting and Shutting Down, Managing user Accounts, backing up data, system security.

#### **UNIT -VI**

Managing the file system

Managing and upgrading the file and directory system

Working with Linux:

Linux Shells, managing multiple processes, using the vi editor, using the emacs editor, printing.

#### **UNIT -VII**

Network administration

Understanding the TCP/IP protocol suite, configuring a TCP/IP network, configuring, domain name service, using SLIP and PPP.

#### **UNIT -VIII**

Using the internet

Accessing the network with telnet, ftp, and r-commands, surfing the internet with World Wide Web, using electronic mail, Usenet news.

Setting up a Web Site

Working with apache, managing an Internet Web server.

#### **Books:**

1. Advanced UNIX: A programmers Guide – Stephen prata, the Wait group, SAMS pub.

2. Using Linux- The most complete reference, third edition QUE pub. –jack Tackett jr.and David Gunter.

## **B.Tech. (Information Technology) V Sem Data Communication 6(3+1+2)**

### **Unit I**

#### **Basic Data Communication Concepts :**

Host computer and terminal modems, parallel and serial transmission Asynchrony and synchronous transmission. Simplex, half duplex and Duplex. Front –end processor, port-sharing device, Line splitters and remote intelligent controllers. Multiplexer: TDM,FDM,VVDM. Data compression devices, Inverse multiplexer.

### **Unit II**

#### **Data Interfaces and transmission :**

Digital interface standards: RS-232 standard, hand shaking, connecting a DTE in RS-232 C, RS –449, RS-422A and RS-423A standards. High-speed desktop serial interfaces. Remote digital transmission carrier ISDN, Packet data network, Digital access. Data communication Efficiency: Modems, AM, FM, Phase modulation, multispeed modems, high speed modems, Error Correcting modems data compression in modems. Short-wave modems, Facsimile and Fax modems.

### **Unit III**

#### **Data Integrity and, security:**

Data Integrity, sources of error control approaches. Implementation of error control Echo checking parity checking and cyclical purity, Hammering code, checksums, Cyclical Redundancy check. Security and security measuring.

### **Unit IV**

#### **Architecture and Protocols :**

OSI models, Traditional communication architecture: System network Architecture and other communication architecture Protocols : polling and selecting , automatic repeat request common link level protocols. Converters and code converters TCP/IP protocols.

### **Unit V**

#### **Data transport Network**



Packet switching, LAN and indent working

**References :**

1. Data & Network Communication, Michael A. Miller – DELMAR (Thomson learning) / Vikas Publication.
2. Data & Computer Communication, William Stallings – Pearson Education.
3. Understanding Data Communication & Networks, William A Shay – Thomson Learning / Vikas Publication.

**B.Tech. (Information Technology) V Sem  
Operating System 4(3+1+0)**

**Unit I**

Introduction to Operating Systems, Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/O devices organization, I/O devices organization, I/O devices organization, I/O buffering.

**Unit II**

Process concept, process scheduling, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

**Unit III**

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation.

**Unit IV**

Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation. Security threads protection intruders-Viruses-trusted system.

**Unit V**

Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.

**References**

1. Operating System by Silberschatz
2. Operating System by Deitel
3. Modern operating system by Tanneubacem.

## **B.Tech. (Information Technology) V Sem Data Base Management System 6(3+1+2)**

### ***Unit I***

DBMS Concepts and architecture Introduction, Review of file organization techniques, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and designer. Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database, Various data models : Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models.

### ***Unit II***

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension, Relational Query languages: Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union etc.

### ***Unit III***

Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

SQL: Data definition in SQL, update statements and views in SQL QUEL &

QBE: Data storage and

definitions, Data retrieval queries and update statements etc.

### ***Unit IV***

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multivalued dependencies. Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery, transaction processing, basic concepts of object oriented data base system and design.

### ***Unit V***

Case study of relational database management systems: Oracle and Microsoft access, Oracle tools.

### ***Practicals***

In this subject the students are supposed to prepare a small database application in complete semester like financial accounting system, Railway reservation system, institute time-table management system, student record system, library management system, hospital management system etc. In RDBMS.

### ***References***

1. Data Base Management System by C.J. Date
2. Data Base Management System by Ullman

3. Fundamental of database system by Elmasri / Navathe the Benjamin / Cunnings Publishing company inc.
4. Database Management System-Narang Prentice Hall of India, New Delhi.

**B.Tech. (Information Technology) V Sem**  
**Principles of Management and Managerial Economics 4(3+1+0)**

***Unit I***

***Management Concept:*** Management, Administration and Organization Difference and Relationship between Organization Management and Administration. Importance of Management, Characteristics of Management

**Unit II**

**Management:** Scientific Management, Principles of Management, Process of Management, Functions of Management, Levels of Management, Project Management

**Unit III**

**Decision Making:** Introduction and Definition, Types of Decisions, Techniques of Decision Making, Decision making under certainty Decision making under uncertainty, Decision Making under risk

**Unit IV**

**Managerial Economics:** Introduction, Factors Influencing Manager, Micro and Macro-economics, Theory of the Cost, Theory of the Firm, Theory of Production Function.

**Unit V**

**Productivity:** Input-Output Analysis, Micro-economics Applied to Plants and Industrial Undertakings, Production and Production system, Productivity, Factors affecting Productivity, Increasing Productivity of Resources

**References**

1. The Practice of Management Peter Drucker Harper and Row
2. Essentials of Management: Koontz, Prentice Hall of India
3. Management Staner, Prentice Hall of India
4. Principle and Practice of Management T.N. Chhabra, Dhanpat Rai New Delhi

5. Industrial Organisation and Engineering T.R. Banga and S.C. Sharma, Economics Khanna Publishers
6. Industrial Engineering and Management O.P. Khanna, Dhanpat Rai
7. Managerial Economics Joel Dean, Prentice Hall of India
8. Managerial Economics Concepts & Cases V.L. Mote, Samuel Paul, G.S. Gupta, Tata Mc Graw Hill New Delhi
9. Managerial Economics V.L.Mote, Tata McGraw Hill
10. Analytical Models for Managerial and Engineering Economics Schweyer Reinhold

## **B.Tech. (Information Technology) V Sem Computer Graphics & Multimedia 6(3+1+2)**

### **Unit I**

Introduction to Raster Graphics, Graphics System Architecture, Concept of scan Conversion of Drawing Primitive 2D and 3D Geometrical transformation, Concept of Windows and View port, 3D Viewing and perspective transformation

### **Unit II**

Illumination and shading models, colors & colors models, geometric transformation of images & image composing filling algorithm, managing windows with bitable

### **Unit III**

**Multimedia:** Definition, component text, audio, graphics, video & hypertext  
Multimedia

**Hardware:** Peripherals Connection: SCSI, IDE, MCI

### **Unit IV**

**Memory:** Optical Storage, CDs, Video Disc Players  
**Input Methodology:** Pens, Image  
Scanners, Digital Camera, Digital Audio, Full motion Video, video camera devices  
Multimedia data & File format standards: RTF, TIFF, MIDI, JPEG-, DIB, JPEG-AVI, MPEG

### **Unit V**

Multimedia Software: Basic Tools, Presentation tools  
Multimedia Authoring tools: Types Of Authoring Tools,  
Card and Page based Authoring tools, illustrations through some authoring tools like author ware Professional  
(Window based): Editing, Authoring, Presentations, Object Oriented Authoring tools.

#### **Suggested Experiments:**

Image Processing & Pattern Recognition Animation of an object Program 2D & 3D image program Other related program

### **References**

1. Tay Vaughan “Multimedia: making it work” Tata McGraw Hill 1999, 4<sup>th</sup> edition
2. Prabhat k Andleigh, Kiran Thakral “Multimedia System Design”, PHI
3. Foley Vandam, Feiner, Hughes “Computer Graphics Principle & Practice” Adison Wesley, 2/e. 1997

**B.Tech. (Information Technology) V Sem**  
**Workshop (Computer Hardware-Lab) 4(0+0+4)**

*Essentials of Networking*

*Installation and implementation of:*

1. Workstations in NOS.
2. Servers in NOS.
3. Enterprise servers in NOS

Options of NOS are

- a. Microsoft Windows NT
- b. Linux
- c. Unix.
- d. Sun-Solaris.

(H/W Examples: AS/400; RS-6000; IBM-Compatible Platform Silicon-Graphics for multimedia; IBM-Net Finity Server)

**B.Tech. (Information Technology) VI Sem**  
**Sub: Advance Microprocessor & Interfacing 6(3+1+2)**

**UNIT -I**

Salient feature of advanced microprocessors. RISC & CISC processors. Review of evolutions of advanced microprocessors: 8086, 8088, 186/286/386/486/pentium. Super scalar architecture of Intel 8086/motorola 68000 and assembly language programming with Intel 8086 microprocessor.

**UNIT -II**

Introduction to the various interfacing chips like 8212, 8155, 8255, 8755 and interfacing keyboards printers LEDS motors ADC, DAC and stepper motors and introduction to programmable keyboard/display interface.

**UNIT -III**

General-purpose programmable peripheral devices (8253) 8254 programmable interval timer 8259A programmable interrupt controller and 8257 DMA controllers.

**UNIT -IV**

Serial I/O and data communication use RS 232C, Modem etc. & various standers.

**UNIT -V**

Introduction to micro controllers, DSP processors & transporters, development tools like MDS, & logic analyzer, Memory interfacing, floppy & CD ROM drives.

**Practical:**

- Write a program for byte multiplication.
- Write a program for word multiplication.

- Write a program for if-then-else implementation.
- To study of DC motor controller.
- To study of serial display card.
- To study of analog to digital converter card.
- To study of keyboard display 8279 chip.
- Write a program for factorial by recursion.
- Write a program for 32 bit division.
- Write a program for BCD to Hexadecimal.

**References:**

1. The INTEL Micro processors, Architecture programming & interfacing, B.B. Brey (PHI),
2. The 8088 & 8086 micro processor, A Triebel & Avtar Singh (PHI),
3. Advanced micro processor & interfacing,. D. Hall (Mc - Graw Hill),
4. Microprocessor principle & applications, A. Pal (TME),.
5. Interfacing techniques in digital design with emphasis on Microprocessors, R.L. Krutz (John wiley),
6. Introduction to Microprocessors". Intel Corporation Microprocessors data manuals, A.P. Mathur (TMA),.
7. Microprocessors fundamentals & applications (Handson), Microprocessor training Inc.,

## **B.Tech. (Information Technology) VI Sem Software Engineering 6(3+1+2)**

### **UNIT -I**

The Software Product and Software Process Software Engineering –A layered Technology Assembly Model, Formal Methods, Fourth-Generation Techniques, Requirement Analyses Modeling.  
The Systems Engineering Hierarchy, Information Engineering. Information Strategy.

### **UNIT -II**

System Engineering.  
Planning, Business Area Analysis, Product Engineering.  
Project Management Concept & Software Project Planning.  
Project Management Concept Project Planning objectives, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Models, and Automation Estimation Tools.

### **UNIT -III**

Design concepts, Principle, and methods the software design process: Design Principles.  
Design concept: Effective Modular Design, design Heuristics, Design Documentation, Design Methods: Data Design, Architectural Design, Interface Design, Human-Computer Interface Design, Procedural Design.

### **UNIT -IV**

Software testing methods.  
Software Testing Fundamentals, Test Case Design, Black-Box Testing.  
Software Testing Strategies: Verification & Validation, Strategic Issues, Unit Testing, Integration Testing.  
Validation Testing, System Testing.  
Software Process & Project Metrics I.  
Measure, Metrics in the Process & Project Domains, Software Measurement, Metrics of Software Quality.

### **UNIT -V**

Object Oriented Software Engineering & CASE.

The Object Oriented paradigm, overview of Object Oriented Analysis (OOA), Object Oriented Design (OOD), Object Oriented Testing Computer Aided Software Engineering (CASE).

**Practical:**

Select any problem & using CASE tools (if needed).

- Analyze the problem & prepare the system requirements specification.
- Draw a context Flow diagram, Data flowing diagram for the system.
- Implement the problem in any language.
- Perform different kind of tests on the product.
- Explore the maintenance responsibilities.
- Find software complexity of the software product.
- Find the Software reliability of the software product.

**References:**

1. Software Engineering: A Practitioner's Approach by R. S. Pressman Fourth edition McGraw- Hill pub.
2. An integrated approach to software Engineering – Pankaj Jlole 1991, Narosa Pub.
3. Software engineering – sommerville Oxford University press 1996.

**B.Tech. (Information Technology) VI Sem**

**Sub: Digital Signal Processing 4(3+1+0)**

**UNIT -I**

Introduction of Digital signal processing. Discrete time signal and sequences, linear shift invariant systems, stability & casualty. Liner constants coefficient difference equations, frequency domain representation of discrete time signals & systems.

**UNIT -II**

Discrete Fourier series transformers: properties of discrete Fourier series, DFS representation of periodic sequences, discrete Fourier transformer: properties of DFT, liner convolution of sequences using DFT. Computation of DFT, fast Fourier transform FFT – Radix 2 decimation in time and decimation in frequency FFT algorithm, Inverse FFT.

**UNIT-III**

Application of Z-transformer solutions of difference equations of digital filters system function stability criterion frequency response of stable systems, realization of digital filters- direct, canonic, cascade & paralle

**UNIT -IV**

IIR Digital filters: analog filter approximation – Butter worth & chebyshev, Design of IIR, Digital filter from analog filter – Bilinear transformation method, step and impulse in variance techniques, spectral transformation.

**UNIT V**

FIR digital filter: Characteristics of FIR digital filters, frequency response, design of FIR digital filter using.

Window technique. Comparison of IIR & FIR filters. Application of FFT in spectrum analysis and filtering.

Application of DSP to speech processing reader signal processing.

**References:**

1. DSP by Opentiem and Schaffer
2. Introduction to DSP by Prokis

**B.Tech. (Information Technology) VI Sem**

**Computer Networking 6(3+1+2)**



## **UNIT -V**

Introduction Theoretical Model for communication, analog and digital signal, bandwidth  
Noise channel capacity, data-rate, concept of circuit switching, Message switching and packet switching with their timing diagrams, comparison of switching techniques, ISDN.

## **UNIT -II**

Evolution of computer network – Layered network architecture, OSI layers model, transmission media – topology, error detection & correction techniques, parity checks, CRC, Asynchronous and synchronous transmission, TDM, FDM.

## **UNIT -III**

Data – link layer: Different types of line discipline, simplex, half duplex and full duplex, flow control; stop and wait protocol, sliding window protocol with their performance, HDLC.

## **UNIT -IV**

LAN: Static & Dynamic channel allocation Media access control for LAN & WAN; ALOHA: pure, slotted.

ALOHA, CSMA, CSMA/CD IEEE 802 standards for LAN & MAN: 802.3, 802.4, 802.5, 802.6 and 802.2 & their comparison Fast LANs: Fast Ethernet, FDDI.

## **UNIT -V**

Routing: Definition, Elements of routing technique, least cost Routing algorithm Dijkstra's algorithm, Bellman - Ford algorithm Routing strategies, Congestion control encryption & description technique.

Internet and Internet

### **Instructional Strategies:**

All units required the lecture, Tutorial, Practical and seminar.

### **Practical:**

- Study of different types of LANs.
- Channel capacity performance.
- B/W – Noise relation working.
- Internet performance.
- Simplex, Half duplex, full duplex performance.
- TDM performance.
- FDM performance.

### **References:**

1. Computer networks – Tanenbaum A. S. PHI.
2. LANs - Keizer.
3. Computer networks – Stalling W., PHI.
4. ISDN & Broad band.

**B.Tech. (Information Technology) VI Sem**  
**Sub: Cellular and Mobile Communication 4(3+1+0)**

**UNIT -I**

Introduction to cellular mobile system. A basic cellular system. performance criteria. Uniqueness of mobile radio environment, operation of cellular systems, planning and cellular system. Analog and digital cellular system.

Elements of cellular radio system design: General description of the problem, Concept of frequency channel, Co channel interface reduction factor, Cell splitting, Consideration of the components of the cellular system.

**UNIT -II**

Interface: Introduction to co channel interface, Real time Co channel interface co channel measurement, Design of antenna system, Antenna parameter and their effects. Diversity receiver non co channel interface different types

**UNIT -III**

Cell coverage for signal and traffic: General Introduction, obtaining the mobile point to point mode propagation over water or flat open area, foliage loss, propagation near in distance. long distance propagation, point to point prediction model characteristics, cell site antenna heights and signal coverage cells, mobile to mobile propagation.

**UNIT -IV**

Cell site antennas and mobile antennas : Characteristics , Antennas at cell site , Mobile antennas . Frequency management and channel Assignment : Frequency management, fixed channel assignment , non fixed channel assignment , Traffic and channel assignment .

**UNIT -V**

Hand off. Dropped call: Why hand off, types of hand off and their characteristics, Dropped call fates and their evaluation.

Operational Techniques: parameters, Converge hole filter, leaky feeders, Cell splitting and small cells. Narrow beam concept.

**References:**

1. Cellular and Mobile Communication by Lee (McGraw I II II)
2. Wireless Digital Communication by Dr. Kamilo Faher (P H I)

**B.Tech. (Information Technology) VII Sem**  
**Management Information System 4(3+1+0)**

**UNIT -I**

Information system: Information, Importance, Taxonomy of information, Integrated information system, Information Resource Management.

**UNIT -II**

MIS: Definition of MIS, Evaluation, MIS component, Fundamental Aspects, Example of MIS, Subsystem of an MIS, Model of MIS, DSS, ESS, GDSS, TPS, KWS.

**UNIT -III**

Organization Structure: Characteristic Organizational Structure, Types of Organization, Managerial issues Organization flexibility.

**UNIT -IV**

Study of Business information system, ERP, MRP-1, MRP-11, operation research latest MIS technologies.

#### **UNIT -V**

Approaches of MIS, System analysis, Database Prospective of MIS, BPR, TQM, case studies.

#### **References:**

5. Mgmt. Info. System, Jane P. Kaudon PHI, 1995.
6. Management information system, James A. O'brien Tata McGraw Hill 1999.
7. Management information system, Gordon B. Davis, Tata McGraw Hill 1984.
8. Operation Research, J. K. Sharma BPB.
9. Management information system, Henry C. Lucys Tata McGraw Hill
10. Analysis design & implementation system, A. K. Sharma, Vikas Pub. House Pvt. Ltd., Delhi

## **B.Tech. (Information Technology) VII Sem**

### **Networking With TCP/IP 6(3+1+2)**

#### **UNIT -I**

The view of network technologies and protocols – Needs of protocols, Comparison of TCP/IP with OSI, goals of TCP/IP architecture. Reviews of wide area and local area networks, Ethernet tech, FDDI, ATM, ARPANET. Internetworking concept & architecture model.

#### **UNIT -II**

Internet addressing – classes of IP addresses, loop back address, mapping internet address to physical address (ARP), determining an internet address at startup (RARP).

Internet protocol (IP): Connectionless data gram, delivery, routing IP data grams error and control messages (ICMP), subnet and supernet address extension.

#### **UNIT -III**

User data gram protocol (UDP): format of UDP message, pseudoheaders, UDP encapsulation and protocol layering, checksum computation multiplexing demultiplexing in UDP.

Transmission control protocol: properties reliable delivery sliding window concept architecture of TCP frame, headers checksum, response to connection time out. Connection establish and release. Routing algorithms, course and peers gateway to gateway protocol (GGP), exterior gateway protocol messages (EGP), internet multicasting.

#### **UNIT -IV**

TCP/IP over ATM networks, client server model of interaction socket interfaces, domain name service DNS.

#### **UNIT -V**

Internet applications & security: Remote login, telnet, FTP, NFS, TFTP, electronic mail (SMTP, MIME). Internet

Management (SNMP, SNMPV2).

Internet security & firewall design, the future of TCP/IP (Ipng, Ipv6).

#### **Practical:**

- To study FTP, Telnet protocols using LINUX platform.
- Write a program to design the fork (), execlp () waitpid, getpid system call.
- Write a program to design a concurrent Server and clients using Sockets and TCP/IP protocol.
- Design a small project for railway reservation system, in which administrator has the power to add trains, seats in a train, delete train, and clients can get reservation to particular train, Authenticity should be checked while clients login to the system. This program should be done using TCP/IP sockets and send (), fork (), receive () and system ().

#### **References:**

1. Internetworking with TCP/IP – Vol. I – Dulgus E. Comer - PHI.

2. TCP/IP and ONC/NFS – Micheal Santifaller – Anderson Wesley.

## **B.Tech. (Information Technology) VII Sem Compiler Design & Translator 6(3+1+2)**

### **UNIT -I**

Compiler, Translator, Interpreter definition, Phase of Compiler introduction to one pass & Multipass Compilers, Bootstrapping, Review of finite automata lexical analyzer, Input, Buffering, Recognition of tokens, Idea about LEX a lexical analyzer generator, Error Handling,

### **UNIT -II**

Review of CFG Ambiguity of grammars, Introduction to parsing. Bottom up parsing Top Down parsing

Techniques, Shift reduce parsing, Operator precedence parsing, Recursive descent parsing Predictive parsers.

LL grammars & parsers error handling of LL parser.

LR parsers, construction of SLR, Conical LR & LALR parsing tables, parsing with Ambiguous grammar.

Introduction of automatic parser generator 1 YA error handling in LR parsers.

### **UNIT -III**

Syntax directed definitions, Constructions of syntax trees, L ~ attributed definitions, Top down translation Specification of a type checker, Intermediate code forms using postfix notation & three address code, representing TAC using triples & quadreples, Translation of Assignment statement. Boolean expression and control structure.

### **UNIT -IV**

Storage organization, Storage allocation, Strategies, Activation records, Accessing local & Non local names in a block

structured language, Parameters passing, Symbol table organization, Data structures used in Symbol tables.

### **UNIT -V**

Definition of basic block control flow graphs DAG representation of basic block, Advantages of DAG, Sources of

optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, Peephole

Optimization, Issues in design of code generator, a simple code generator, Code generation From DAG.

### **Practical:**

1. Write a program to construct deterministic finite automata from nondeterministic finite automata.
2. Write a program to construct an NFA from a regular expression.
3. Write a program to minimize the number of states of a DFA.
4. Write a program for top down parsing.
5. Write a program to construct SLR parsing tables.
6. Write a program to construct LALR parsing tables.
7. Write to calculate the operator precedence relations.

### **References:**

1. Principles of Compiler design By Aho-Ullman Narosa Publishing House.
2. Compilers: Principles Techniques & Tools By Aho-Ullman – Sethi Addison wesley.
3. Compiler Construction By Dhamdhare



**Elective I (A)**  
**B. Tech. (Information Technology) VII Sem**  
**Robotics and Computer Vision 4(3+1+0)**

**UNIT -I**

Introduction Background, Robot arms, Kinematics and introductory dynamics. Manipulator, Trajectory planning motion control robot sensing.

**UNIT -II**

Robot arm kinematics, the direct kinematics problem, Different types of rotation and transformation matrix DH representation.

**UNIT -III**

Sensing: Different type of sensing method range sensing, Proximity sensing, Types of sensor, Force, Touch sensor, Sensor calibration.

**UNIT -IV**

Computer vision, Low- level vision, Image acquisition, Illumination techniques imaging geometry, stereovision, and segmentation.

**UNIT -V**

Robot programming languages: Characteristic of task level, Robot level languages, Sensing and flow of control task specification, Robot programmed synthesis.

**References:**

1. Robotics, K.S. FU.
2. Computer Vision, Brown.

**Elective I (B)**  
**B. Tech. (Information Technology) VII Sem**  
**Very Large Scale Integration Circuit Design 4(3+1+0)**

**UNIT -I**

Introduction to CMOS Circuit, Circuit & System representation behavioral representation structure representation. Physical representation MOS Transistor Theory. NMOS & PMOS enhancement transistor threshold voltage, Body effect. MOS Device Design Equation. Basic DC Equation, Second order effect, MOS models.

**UNIT -II**

The complementary CMOS inverter – DC Charact, Static load MOS inverters. The differential inverter. Tristate inverter. Bipolar devices, Diodes, Transistors, BICMOS inverters.

**UNIT -III**

Review of silicon semiconductor technology & basic CMOS technology – n – well & p- well process interconnect & circuit twin – tub process layout design rules & latch-up, latch-up triggering & prevention.

**UNIT IV**

Circuit Characterization & performance estimation resistance & capacitance estimation, Switching characteristics CMOS gate transistor sizing, Power dissipation. Basic physical design of simple logic gates. CMOS logic structure.

**UNIT -V**

CMOS design methods. Design strategies. Programmable logic, Programmable logic structure, reprogrammable gate arrays. Exiling Programmable gate arrays. Algotonix, Concurrent logic, sea of gate & gate arrays design /HDL as a tool.

**References:**

1. Principles of CMOS VLSI design. Author: Neil, H. E. WASDTE, KAMRAN ESHRAGHIAN, publisher Addison-Wesley

**Elective I (C)**

**B. Tech. (Information Technology) VII Sem  
Material Science & Technology 4(3+1+0)**

**UNIT -I**

Polymers – General introduction mechanism of polymerization plastics their manufacture engineering properties & uses, thermoplastic resins – cellulose nitrates, polythene, polystyrene, polycrylonitile, polymethyl, methacrylate polyvinyl acetate, P.V.C., fluorocarbons polyamides thermosetting resins – phenolic resins, Amino resins, polyesters, silicones.

**UNIT -II**

Elastomers – Natural & synthetic rubbers, Vulcanization preparation, properties & uses of Buna – S, Buna – N, Bunt rebber neoprene polyurethanes.

**UNIT -III**

Semiconductor & Superconductor – Structure, conduct process, type of doping, semiconductor junction photo conductivity, HS & DHS layers. Elementary properties joshephosons effect & BCC theory, new super conducting material application liquid He – I & HE – II, mercury material (Nitinol).

**UNIT-IV**

Dielectric & Magnetic properties – Polarijetion process, classius mossoti eq. Dielectric break down, productive material, various types of dielectric capacitor & other application of dielectric Classification of magnetic, materials, hysteresis loop, domain theory, soft & hard magnetic material, ferrites application.

**UNIT -V**

Ferrous & Not – Ferrous material & problems — Ferrous material: production of iron & steel heat treatments of steel composition, properties, use of carbon steels, alloy – steel nickel steel, chrome steel, Tool steel, the effect of alloying elements.

Non ferrous material: Al, Cu, Mg, Pb, Sn, Zn, Ni, physical & mechanical properties, techniques uses.

Non ferrous alloys: Cu alloy, Al alloy, Ni alloy, Mg alloy, bearing alloy. Corrosion, types of corrosion, dry & electrochemical corrosion & mechanism, galvanic corrosion, specific type spitting water line, intergranular, stress, corrosion. Fatigue, erosion. Control & prevention of corrosion-metallic & non metallic coating protections.

**References:**

1. Material Science – Narula & Gupta, Tata McGraw Hill.
2. Engineering Materials – R. K. Rajput, S. Chand & Co. Ltd.
3. Super Conductivity today – C. N. R. Rao, University Press.
4. Engineering Chemistry – S. S. Dara, S. Chand & Co. Ltd.
5. Rubber Engineering, Tata McGraw Hill.
6. Electronic Engineering Materials & Devices – John Allison, Pub. McGraw Hill.

**Elective I (D)**

**B. Tech. (Information Technology) VII Sem**

## Simulation and Modeling 4(3+1+0)

### UNIT -I

Definition of systems:

Type of system, continuous and discrete modeling process and definition of a model. Common type of Mathematical models used for Engineering and Non- Engineering system (Such as differential and partial Differential equation models.)

### UNIT -II

Simulation process:

Discrete and continuous simulation procedures. Random number generation & it's testing discrete & Continuous random variables density & distributive functions, Study of few distributions such as Poisson, Normal.

### UNIT -III

Simulation of queuing system:

Elementary idea about networks of queuing with particular emphasis to computer system, environment.

### UNIT -IV

Verification & validation: Design of simulation experiments & validation of simulation experiments comparing model data units & Real system

Data.

### UNIT -V

Simulation language: A brief introduction to important discrete & continuous language such as GPSS (study & use of the

Language). Use of Data base & AI techniques in the area of modeling & simulation.

### References:

1. System Simulation with Digital Computers, Deo, narsing
2. System Simulation Gordon G., prentice hall.
3. Probability & Statistics with Reliability Queuing, Computer Science Shridhar Bhai trivedi, Kishore
4. Introduction to System Simulation, Payer, T. A McGraw hill.
5. Computer Simulation Application, Reitman.J, wiley.
6. Modelling & performance measurement of computer system, Barnes B,
7. Computer aided Modelling & Simulation (Academic Press), Sprite W.I.A.

Elective II (A)

**B. Tech. (Information Technology) VII Sem**



## **Cryptography & Data Security 4(3+1+0)**

### **UNIT -I**

Internet & communication protocol a brief history of internet, OSI, TCP/IP, The need for Tunneling & encryption keys tunneling, internet protocol security.

### **UNIT -II**

Determining needs: the evolution of security assessment assessing needs in house. The management role web access question continues networks vulnerability detection penetration testing, internal security needs structure query language security & other specialties.

### **UNIT -III**

Trends in internet crime denial of service attack, tools that work for and against the network IP spoofing attack, the telnet whole language vulnerabilities other threat – java & active X, UNIX root control, Trojan horses.

### **UNIT -IV**

Virtual private network, Firewalls & Disaster recovery planning security tools.

### **UNIT -V**

Different encryption & decryption algorithm concept of private & public keys.

## **Elective II (B)**

## **B. Tech. (Information Technology) VII Sem Artificial Intelligence 4(3+1+0)**

### **UNIT -I**

Meaning & definition of artificial intelligence, various types of production systems, Characteristics of production systems, Study & comparison of breadth first search & depth first search techniques, other search Techniques like hill climbing, Best first search. A\* algorithm, AO\* algorithm etc. and various types of control strategies.

### **UNIT -II**

Knowledge representation, problems in representing knowledge, knowledge representation using propositional & predicate logic, comparison of propositional & predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic & non monotonic reasoning.

### **UNIT -III**

Probabilistic reasoning Baye's theorem, semantic network scripts schemas, frames conceptual dependency, Fuzzy logic, forward & backward reasoning.

### **UNIT -IV**

Grand playing techniques like minimax procedure, alpha beta cut-offs etc. planning, study of the block world problem in robotics, introduction to understanding and natural language processing.

### **UNIT -V**

Introduction to learning various techniques used in learning, introduction neural networks, application is a neural networks, common sense, reasoning, some example of expert systems.

### **References:**

1. Artificial intelligence, Rich E & Knight K., TMH, New Delhi.
2. Principles of Artificial intelligence, Nilsson N.J Springer Verlag, Berlin.
3. Artificial intelligence, Addison Wesley, Barr A, Fergsnbaub E.A. & Cohen P.R., Reading (Mass).
4. A guide to Expert system, Addison Wesley, Waterman D.A., Reading (Mass).

**Elective II (C)**  
**B. Tech. (Information Technology) VII Sem**  
**Data Mining & Warehousing 4(3+1+0)**

**UNIT -I**

Information, Theoretic Approach to knowledge discovery – Data explosion in the Internet age, Knowledge discovery in databases (KDD), Verification – Based Methods of data mining, Feature Selection Methods, Learning issues, Information theory-the data mining perspective, Data Modeling, Book Organization.

**UNIT -II**

Automated data pre-processing – Discretization of Ordinal Features, Static Discretization Algorithms, The partitioning Procedure, Computational Complexity of the Static Algorithm, Static Discretization and Dimensionality Reduction.

**UNIT 3-III**

Information-Theoretic Connectionist Networks – A unified Approach to data Modeling, constant structure Information-Theoretic Network, Multi-Layer Information-Theoretic Network, Dynamic Discretization of ordinal Attributes. Post-Processing of data mining results-rule Extraction & Reduction, Prediction, From local to Global modeling.

**UNIT -IV**

Methodology of Application – Overview of the Discovery Process, Understanding the Problem Domain obtaining & understanding the data, Preparation of the data, Construction of data, Construction of the knowledge model from data, Evaluation of the model, Using the model (Interpretation & Post – Processing ) Advanced data mining methods – Any time algorithm for knowledge discovery, Data reliability.

**UNIT -V**

Summary & Some Open Problem; Methods Benefits & limitation Future research.

**References:**

1. Knowledge Discovery & Data mining by Oded Maimon & Manku Last. Kluwer Academic Publish

**B.Tech. (Information Technology) VIII Sem**  
**Distributed Systems 6(3+1+2)**

**UNIT -I**

Introduction to distributed system

Goals of Distributed system, Hardware concepts, Design issues.

Communication in distributed system. System, Layered protocols, ATM networks, the Client-Server Model, Remote procedure calls and group communication.

**UNIT -II**

Synchronization in Distributed Systems

Clock Synchronization, Mutual exclusion, Election algorithms, the Bully algorithm, A ring Algorithm, Atomic transaction, dead lock in distributed systems, Distributed dead lock prevention, and distributed dead lock detection.

**UNIT -III**

Processes and Processors in distributed systems

Threads, System Models, processor allocation, Scheduling in distributed system, Fault tolerance and real time distributed systems.

**UNIT -IV**

Distributed file systems

Distributed file systems design, Distributed file system implementation, Trends in , Distributed file systems.

Distributed shared memory: What is shared memory, Consistency models, Page based distributed shared memory, and Shared variable distributed shared memory, Object based

#### **UNIT -IV**

Case Study MACH

Introduction to ACH, Process management in MACH, UNIX emulation in MACH.

Case Study DCE: Introduction to DCE thread, RPC's Tim service, Directory service, Security service, Distributed file system.

#### **Practical:**

1. Write a program using HTML tags which includes tables, formatting, image maps, hyperlinks, background images etc.
2. Write a program in JAVA and JSP using GDBC and ODBC driver to create the employee data base using front-end and insert the record, delete the record, update the record using front-end. Proper login id and password should be checked for Administrator.
3. For above program (program no. 2) different queries must be designed to retrieve information from database.

#### **References:**

1. Distributed Operation System, Tanenbaum Andrew. S, PHI

## **B.Tech. (Information Technology) VIII Sem Web Engineering 6(3+1+2)**

#### **UNIT -I**

Introduction

Introduction, layering, DNS – encapsulation, de-multiplexing, client/server model, port numbers, standardization process, the Internet.

Link layer: Introduction, Ethernet and IEEE 802 encapsulation, trailer encapsulation, SLIP, PPP- Loop back interface, MTU.

Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask-special case of IP addresses, a subnet example.

#### **UNIT -II**

Address Resolution Protocol

Introduction, an example, ARP cache, ARP packet format, ARP examples, Proxy ARP, ARP command.

RARP: Introduction RARP packet format, RARP examples, RARP server design.

ICMP: Introduction, ICMP message types, ICMP address mask request and reply- ICMP timestamp request and reply – 4.4 BSD processing of ICMP.

#### **UNIT -III**

Ping Program

Introduction, ping program, IP record route option, IP time option.

Trace route program: Introduction, trace route program operation, LAN output, and WAN output- IP source routing option.

IP routing: Introduction, routing principles, ICMP host, and ICMP redirect errors

Dynamic Routing protocols: Introduction, Dynamic routing, RIP-OSPF, BGP, and CIDR.UDP: introduction, UDP header UDP checksum, IP Fragmentation, UDP Server design.

#### **UNIT -IV**

## DNS

Introduction – basics, message format, simple example, pointer queries, resource records, caching, UDP

TFTP: introduction, protocol, security. BOOTP: introduction, packet format, server design, through router.

TCP: Introduction, services, headers, connection establishment and termination, timeout of connection establishment- maximum segment size-half, close, state transition diagram, reset segments, simultaneous open and close- options, server design.

## UNIT -V

### SNMP

Introduction, protocol, structure of management information, object identifiers, management information base, instance identification.

Telnet: rlogin protocols, examples, telnet, protocol and examples. FTP, protocol, examples, SMTP protocols, examples, NFS, TCP/IP Application.

### Practical:

- Write a program to understand Sockets, create sockets, bind sockets, listen, accept, send and receive system calls.
- Write a program to design a concurrent server and clients using TCP/IP protocol, where client login and enters login id and password and these login id and password are verified at server end if login successful server gives the message that login successful else failure.
- Design the same problem for server and client using UDP sockets.
- Write server client a program for railway reservation system.

### References:

1. TCP/IP illustrated Volume, I "The Protocols", W. Richard Stevens, Addison Wesley Longman.
2. TCP/IP Principles, Architecture, Protocols and Implementation, Jaiswal . S. First Edition, Galgotia Publication Pvt.Ltd.

## Elective I (A)

## **B.Tech. (Information Technology) VIII Sem** **ATM Network 4(3+1+0)**

### UNIT -I

Introduction to ISDN, B-ISDN, B-ISDN services, ATM basics, ATM Services, Architecture of B-ISDN, virtual channel, Virtual path ATM performance Parameters, Signaling techniques

### UNIT -II

ATM – performance Reference Model (PRM) layered architecture, relationship between ATM PRM and OST reference model. Layer functions, User Network Interface (UNI), Physical layer of UNI, functions of transmission convergence sub layer, physical medium characteristic ATM layer cell headers of B- ISDN, UNI & NNI, ATM adaptation layer, operation and maintenance of B-ISDN UNL.

### UNIT -III

B-ISDN signaling, meta signaling, ATM adaptation layer for signaling, signaling protocols, switches & cross connects.

### UNIT -IV

ATM transmission network, Cell transfer functions, transmission systems, network synchronization, B-ISDN local network Topology & Technology, trunk, network structure, ATM network implementation and its equipments.

#### **UNIT -V**

Evolutionary scenarios for B-ISDN fiber to the customer, integration of TV distribution, LAN's Man's to B-ISDN, Voice delay & Echo problem, Tainting in B-ISDN, Telecommunication management networks, Gigabits LAN's, Optical switching, ATM standardization.

#### **References:**

1. ATM Network, Rainer Handel, Huber & Schooder Addison Wesley
2. ATM Theory & application, David E Mc Dycan McGraw Hill
3. Computer Network Tennenbaum,
4. An Introduction to ISDN, William Stallings McMillan publishing co. USA

**Elective I (B)**  
**B.Tech. (Information Technology) VIII Sem**  
**Embedded System 4(3+1+0)**

**UNIT -I**

Introduction and Review of Embedded Hardware

Terminology Gates, Timing Diagram, Memory, microprocessors Buses, Direct Memory Access, interrupts, Built, ins on the Microprocessor, Conventions Used on Schematic, Interrupts Microprocessor Architecture, Interrupt Basics, Shared Data Problem, Interrupt latency.

**UNIT -II**

Pic Micro controller And Interfacing

Introduction, CPU architecture, registers, instruction sets addressing modes Loop timing, M, Analog to digital converter, UART, Baud Rate, Data Handling, Initialisation, Special Features, serial Programming, Parallel Slave Port.

**UNIT -III**

Embedded Microcomputer Systems

Motorola MC68hll Family Architecture Registers, Addressing modes Programs. Interfacing methods parallel I/O interface, Parallel Port interfaces, Memory Interfacing, High Speed I/o Interfacing, Interrupts, interrupt service routing, features of interrupts, Interrupt vector and Priority, timing generation and measurements, Input capture, Output compare, Frequency Measurement, Serial I/O devices RS. 232, RS. 485. Analog Interfacing Applications.

**UNIT -IV**

Software Development and Tools

Embedded system evolution trends. Round, Robin, robin with Interrupts, function, one, Scheduling Architecture, Algorithms. Introduction to, assembler, compiler, cross compilers and Integrated Development Environment (IDE) Object Oriented Interfacing, Recursion, Debugging strategies, Simulators.

**UNIT -V**

Real Time Operating systems

Task and Task States, tasks and data, semaphores and shared Data Operating system Services, Message queues, Timer Function, Events, Memory Management, Interrupt Routines in an RTOS environment, Basic design using RTOS.

**References:**

1. An embedded software Primer, David E Simon, Pearson education Asia
2. Design with Micro controller, John B Peat man, Pearson education Asia
3. Embedded Micro Computer Systems. Real time Interfacin, Jonathan W.Valvano Brooks/Cole Thomson learning.
4. Real-Time Systems and Programming Lnguages, Burns, Alan and Welling, Andy Second Edition. Harlow: Addison, Wesley, and Longman
5. An Introduction to real time systems: Design to networking with C/C++, Raymond J.A. Bhur and Donald L. Bialely ,Prentice Hall Inc. New jersy.
6. Real time Programming. A guide to 32 Bit Embedded Development. Reading, Grehan Moore, and Cyliax, Addison, Wesley, Longman
7. Embedded Systms Design, Health, Steve, Newnes.

**Elective I (C)**  
**B.Tech. (Information Technology) VIII Sem**  
**Software Engineering Methods & Standards 4(3+1+0)**

**UNIT -I**

Software Engineering

Scope, importance and roles of Software Engineering standards view relationships of standards, standard organizations and groups like IEC, ISO, CS, EIA, etc. and their role in standardization.

**UNIT -II**

Customer and Terminology Standards.

IEEE std. 610.12 – Software engineering terminology, IEEE P 729- fundamentals term of SE, IEEE Std1002- Taxonomy for SE standards, ISO/IEC 2382 and ISO/IEC TR 12382 – information Technology vocabulary, ISO/IEC DTR 12182 – Categorization of software, ISO/IEC DTR 14399- mapping of SE standards, 12207 Acquisition process IEEE std 1062 – Software Acquisition, ISO 6592- Documentation of computer- based application system.

**UNIT -III**

Process standards

IEEE/ELA 12207 software life cycle process, Overview, Primary Processes of 12207, IEEE std 1074- Developing Software life cycle processes IEEE- Processes std 1008- Software unit testing, IEEE std 1219 and ISO/IEC WD 14761 – Software Maintenance Supporting Processes of 12207, IEEE std 730- Software Quality Assurance plans, IEEE std 828 and 1042 – Software Configuration Management Plan IEEE std 1012 and 1059 – software Verification and Validation plan IEEE std 1028 – Software Review and Audits ISO/IEC TR 9294 – Management of S/W Documentation ISO/IEC DTR 15504- Software Process Assessment. IEEE std 1228 – software safety plans, IEEE std 1058- software project management plans.

**UNIT -IV**

Product standards

Product Evaluation Standards: IEEE std 1061- Software Quality Metrics Methodology, ISO/IEC 9126-Software Product Quality Characteristics, ISO/IEC CD 14598 – Software Product Evaluation, Product Characteristic Standards: IEEE std 982.1 and 982.2 – Measures to Produce Reliable Software, ISO/IEC DIS 14143-1-Functional Size Measurement, ISO/IEC CD 14756 – Measurement and Rating of performance, Software Product Packaging Standards: ISO 9127 – Consumer Software Documentation and Cover Information, ISO/IEC 12119, Software Package Quality Requirements and Testing IEEE std 1063- Software User Documentation.

**UNIT -V**

Resource and Techniques standards

Techniques: IEEE std 1044 and 1044.1- Classification of Anomalies, ISO 6593-Processing Sequential Files of Record Groups, Reuse Libraries: AIAA G- 010-Reusable Software: Assessment Criteria for Aerospace Applications, IEEE std 1420 – Data Model for Reuse Library Interoperability, IEEE 1016- recommended practice for software design description, IEEE std 1430 – Concept of Operations for Interoperating Reuse Libraries, Tools: IEEE std 1175 – Reference Model for Tool Interconnections, IEEE std 1348 and ISO/IEC DTR 14471- adoption of CASE Tools.

**References:**

1. IEEE Press IEEE Software Engineering Standards Collection : 1999 Edition Volume – 4
2. Software Engineering Standards: A User's Road Map, J.W. Moore,
3. Software Quality Producing Practical, Modechai Ben, Menachem, Garry S. Marliss, Consistent Software, Vikas/Thomson.



**Elective I (D)**  
**B.Tech. (Information Technology) VIII Sem**  
**Digital Image Processing 4(3+1+0)**

**UNIT -I**

Digital Image fundamentals, A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images

**UNIT -II**

Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

**UNIT -III**

Image enhancement, Filters in spatial and frequency domains, Histogram based processing, Image subtraction, Averaging, Image smoothing, Median filtering, Low pass filtering, Image sharpening by High pass filtering.

**UNIT -IV**

Image encoding and segmentation, Encoding, Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuity by point detection, Line detection, edge detection, Edge linking and boundary detection Local analysis, Global processing via Hough transforms and graph theoretic techniques.

**UNIT -V**

Mathematical morphology – Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation

**References:**

1. Digital Image Processing, R Gonzalez & Richard E. Woods,
2. Image Processing, Analysis and Machine Vision Sonka HLAVAC, Boyle, Vikas Pub.
3. Digital Image Processing Pratt K William, John Wiley
4. Analysis and Machine Vision, Sonka M, Hilvac V, Boyle R, Vikas/Thomson Learning.

**Elective I (E)**  
**B.Tech. (Information Technology) VIII Sem**  
**Enterprise Resource Planning (ERP) 4(3+1+0)**

**UNIT -I**

**Manufacturing Industry – Management Characteristics and Information Requirements**

Industry classification, Product/Market/Process Characteristics, Manufacturing planning and control techniques EUP Concepts & Evaluation History, MRP-I MRP II ERP. Information Technology Advancement. Client server technology, RDBMS.

**UNIT -II**

**Sales, Purchase & Inventory Control, Concepts**

Classification/coding of material & finished goods, Sales enquiry, Quotation, Order invoicing, delivery finished good valuation, purchase requisition, enquiry, supplier quotation, purchase order, Material receipts, Material issues, Methods of issue Valuation (FIFO/LIFO/Weighted Average Cost/Std. Cost) , Returns from operations Returns to supplier, Stock Adjustments, Physical Stock verification, ABC analysis. Lot and Locations control, Replenishment order control (safety stocks, report point, Economic Order Quantity)

### **UNIT -III**

#### **Manufacturing**

Product configuration, Bill of material, Mater Production Scheduling, Material Requirement planning, Capacity Requirement Planning, Loading and Scheduling. An overview of man power planning and customer manufacturing planning.

### **UNIT -IV**

#### **Financial & Cost Accounting**

Basic accounting principles, Day book-Cash, Bank, Journal, Purchase and sales. Ledges-General, Supplier, Customer, Advances etc Bank Reconciliation, Trial Balance, Profit & Loss/Income & Expenditure account and Balance Sheet. Fixed assets and depreciation. Budgeting-Revenue, Capital Cash, Cost Elements-Direct material, Direct Labour, Direct expenses and overheads. Margin at costing and Break even analysis, Standard Costin, Activity Based Costing.

### **UNIT -V**

#### **Introduction to A Typical /ERP Software**

Overview of ERP modules and tools of a software like BaaN.

#### **Distribution Module**

Module Architecture-an overview, Item data, Purchase order ordering/control, Replenishment order control, Electronic Data

#### **Manufacturing Module**

Module architecture-an overview, Capacity Requirement, Planning, Engineering change control, Engineering data Management, Master Production Scheduling, Materials Requirement Planning, Product Classification/configuration, Production planning/control, Repetitive Manufacturing.

#### **Finance Module**

Module architecture – an overview, Accounts payable, Accounts recivable, General ledger, Cost allocation, Cash management Activity based costing, fixed assets, Financial budgeting system.

References:

1. Materials Requirement Planning, the New Way in Production and Inventory Management, Joseph Orlicky, McGraw Hill book Company, New Delhi
2. Baan Student Manuals, Baan Educatin Centre, Hyderabad..
3. ERP, Alexis Leon, Tata McGraw Hill.

Elective II (A)

## **B.Tech. (Information Technology) VIII Sem**

### **Wireless Networking and Computing 4(3+1+0)**

### **UNIT -I**

Introduction to wireless, Cellular, Digital, PCS mobile radio, Speech coding for wireless system and application like PCM, DPCM, DM, Vocoder & Linear Predictive coding, Performance comparison.

### **UNIT -II**

Media Access Control, Telecom System Satellite System, Broadcast System

### **UNIT -III**

Wireless LAN

IEEE 802-11 Hiper LAN, Bluetooth, Adhoc Network, Characteristic, Performance issue, Routing in mobile host.

#### **UNIT -IV**

Network issue

Mobile IP, DHCP, Mobile Transport layer, Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective transmission, Transaction oriented TCP

#### **UNIT -V**

Application issue

Wireless Application control Dynamic DNS File System synchronization protocol, Context aware application security, Analysis of existing wireless Network.

#### **References:**

1. Mobile Communication, J. Schiller, Addison Wiley
2. Mobile Comm. Design Fundamental. William C.Y. Lee, John wiley
3. Wireless Digital Communication, Dr. Kamilo Feher PHI
4. Design & Implementation of Wireless LANs, Mark Ceampa, Thomson Learning

Elective II (B)

### **B.Tech. (Information Technology) VIII Sem**

#### **Real Time System 4(3+1+0)**

#### **UNIT I**

Introduction to real -time system, Definition, components of a real time system sensor and transducers, signal conditioning, computer input and output, the processor output, the processor output conditioning and power control, actuators. Computer hardware requirements for real time system, general purpose computer, CPU, memory RAM, ROM, Cache memory DMA, selection of memory, buses computer input and output. Real time operating system: Concepts basic elements of an operating system, operating systems facilities, real time operating systems facilities, real time operating systems, tasks and task scheduling, task synchronization and data transfer factors in selecting a real time operating system.

#### **UNIT -II**

Design of real-time system: Prelude to the design process General approach, the system components, the design specifications, the development environment, hardware development system software.

Analysis and design: Analysis of required documents, response-time specification on human interface, preliminary system design, block diagram, representation of control flow and data flow, functional decomposition and relationship among them, modular design, estimation of cost, required development time, program length, execution time and required memory. Software Design Structural flowcharts, stepwise development and programming, testing the model.

#### **UNIT -III**

Selection of programming languages machine and assembly languages, limitations of assembly language, High-level languages, advantages and disadvantages of high level languages, real time languages, choosing a language. Integrating assembly-language components Processor background information required, subroutine calls and returns, subroutine parameters, linking high and low level programs, start up routines, computer interrupt systems and service routines.

#### **UNIT -IV**

Interface and control: Parallel input and output interfaces, D to A and A to D conversion interface, digital representation of analog voltage full scale voltage, successive approximation A/D. dual A/D. flash converter sample and hold circuit, the multiplexer, real time clock interfaces, direct memory access interfaces. Input Systems: Sensors with binary-state supports, sensors that produces, continuous analog signals, signal conditioning circuits, transmission circuitry, bus compatible input systems.

Output Systems: output systems involving two state actuators, output systems with continuous actuators.

#### **UNIT -V**

Board - based microcomputer systems, The Backplane Bus: Address and data lines data transfer lines interrupt lines, and microprocessor control lines, Power supply lines, characteristics boards or bus system CPU board, memory board, peripheral device controller and I/O boards, selection a bus system, Study of fault tolerant systems.

Concept of fault tolerant in a system different characteristics and features of fault tolerant system.

#### **References:**

1. Principles of Real Time System, Levi and Agrawala.
2. Real Time Systems, CM Krishna, and Shin KG

Elective II (C)

**B.Tech. (Information Technology) VIII Sem**

**Data Mining and Warehousing 4(3+1+0)**

**UNIT -I**

Information, Theoretic Approach to knowledge discovery- Data explosion in the internet Age, Knowledge discovery in databases (KDD), Verification- Based Methods of Data Mining, Feature Selection Methods, Learning issues, Information theory-the data mining perspective, Data Modeling, Book Organization.

**UNIT -II**

Automated data pre-processing- Discretization of Ordinal Features, Static Discretization Algorithms, The Portioning Procedure, computational complexity of the static algorithm, Static Discretization and dimensionality reduction.

**UNIT -III**

Information-Theoretic Connectionist Networks- A Unified Approach to data modeling, constant structure information- Theoretic Networks, Multi-Layer Information- Theoretic network, dynamic discrimination of ordinal attributes. Post-Processing of data mining results-rules extraction and reduction, prediction, from local to global modeling.

**UNIT -IV**

Methodology of Application - Overview of the Discovery Process, Understanding the Problem Domain, Obtaining and Understanding the Data, Preparation of the Data, Construction of the Knowledge Model from Data, Evaluation of the Model, Using the Model (Inter preparation and Post - Processing) Advanced data mining methods- Anytime Algorithm for Knowledge Discovery, Data Reliability.

**UNIT -V**

Summary and Some Open Problems- Methods Benefits and Limitations Future Research.

References:

1. Knowledge Discovery and Data Mining, Oded Maimon & Mank ,Kluwer Academic Publisher.
2. Decision Support and Data Warehouse Systems, Efreem G Mallach, TMH

Elective II (D)

**B. Tech. (Information Technology) VIII Sem**

**Robotics and Computer Vision 4(3+1+0)**

**UNIT -I**

Introduction Background, Robot arms, Kinematics and introductory dynamics. Manipulator, Trajectory planning motion control robot sensing.

**UNIT -II**

Robot arm kinematics, the direct kinematics problem, Different types of rotation and transformation matrix DH representation.

**UNIT -III**

Sensing: Different type of sensing method range sensing, Proximity sensing, Types of sensor, Force, Touch sensor, Sensor calibration.

#### **UNIT -IV**

Computer vision, Low- level vision, Image acquisition, Illumination techniques imaging geometry, stereovision, and segmentation.

#### **UNIT -V**

Robot programming languages: Characteristic of task level, Robot level languages, Sensing and flow of control task specification, Robot programmed synthesis.

#### **References:**

1. Robotics, K.S. FU,
2. Computer Vision, Brown

