

B.Tech. in Computer Science & Engineering

SEMESTER I

S. No.	Course Code	Subject	L-T-P	Credits
1	LNG 302	Professional Communication - I	3-0-0	3
2	CHEM 513	Engineering Chemistry	3-1-2	5
3	MAS 411	Engineering Mathematics – I	3-1-0	4
4	EE 302	Electrical Engineering	3-0-2	4
5	PHY 311	Engineering Physics - I	3-0-2	4
6	ECE 301	Basic Electronics	2-1-2	4
7	ME 301	Engineering Graphics – I	0-0-4	2
8	GPT 301	Moral and Value Education	2-0-0	2

SEMESTER II

S. No.	Course Code	Subject	L-T-P	Credits
1	LNG 303	Professional Communication - II	3-0-0	3
2	PHY 312	Engineering Physics II	3-0-2	4
3	MAS 490	Engineering Mathematics – II	3-1-0	4
4	CE 401	Engineering Mechanics	2-1-0	3
5	CSIT 401	Computer & Languages	2-1-2	4
6	ME 304	Workshop Practice & Technology	2-0-4	4
7	ME 401	Engineering Graphics – II	0-0-4	2
8	ME 302	Introducing to Manufacturing Process	2-0-0	2

SEMESTER III

S. No.	Course Code	Subject	L-T-P	Credits
1	CSIT 409	Principles of Programming Languages	3-1-0	4
2	CSIT 410	Data Structures Using 'C'	3-1-2	5
3	CSIT 413	Web Technologies	2-1-2	4
4	CSIT 414	Principles of Operating system	3-1-2	5
5	ECE 402	Switching Theory & Logic Design	2-1-0	3
6	MAS 621	Discrete Mathematics	3-0-0	3
7	ENV 415	Environmental Studies - I	2-0-0	2

SEMESTER –IV

S. No.	Course Code	Subject	L-T-P	Credits
1	CSIT 411	Principles of Database Management System	3-1-2	5
2	CSIT 412	Computer Organization	3-1-2	5
3	CSIT 415	Object Oriented Programming	3-1-2	5
4	ECE 506	Digital Communication System	3-1-2	5
5	MAS 491	Computer Based Numerical and Statistical Techniques	2-1-2	4
6	ENV 416	Environmental Studies - II	2-0-0	2
7	CSIT 418	Information Security	2-0-0	2

SEMESTER – V

S. No.	Course Code	Subject	L-T-P	Credits
1	CSIT 511	Principles of Computer Networks	3-1-2	5
2	CSIT 512	Design & Analysis of Algorithms	3-1-2	5
3	CSIT 513	Microprocessors and Applications	2-1-2	4
4	CSIT 514	Theory of Automata and Formal Languages	3-1-0	4
5	BAM 315	Elements of Economics and Principles of Management Science	3-1-0	4
6	ECE 641	Embedded Systems	3-0-0	3
7	CSIT 400	Industrial Training - I	0-0-2	1
8	CSIT 580	Seminar – I	0-0-2	1

SEMESTER-VI

Sl.No	Course Code	Subject	L-T-P	Credits
1	CSIT 515	Principles of Software Engineering	3-1-0	4
2	CSIT 516	Compiler Design	3-1-2	5
3	CSIT 517	Computer Architecture	3-1-0	4
4	CSIT 518	Computer Graphics	3-1-2	5
5	CSIT 605	Java Programming	3-1-2	5
6	BAM 317	Organizational Behaviour	3-0-0	3
7	CSIT 680	Seminar - II	0-0-2	1

SEMESTER –VII

Sl. No	Course Code	Subject	L-T-P	Credits
1	CSIT 603	Software Project Management	3-1-0	4
2	CSIT 604	Systems Programming	3-1-2	5
3	CSIT 606	.Net Technology	2-1-2	4
5	MAS 651	Principles of Operations Research	3-1-0	4
6	CSIT 500	Industrial Training - II	0-0-2	1
7	CSIT 608	Artificial Intelligence	2-1-2	4
8	CSIT699a	Project (Project Formulation)	0-0-4	2

SEMESTER –VIII

Sl. No.	Course Code	Subject	L-T-P	Credits
1	CSIT 641-650	Elective –I	3-1-0	4
2	CSIT 651-660	Elective –II	3-1-0	4
3	CSIT 661-670	Elective –III	3-1-0	4
4	CSIT 699b	Project (Project Execution and Report)	0-0-12	6

Total Credits offered for eight semesters is 204.

ELECTIVE PAPERS

ELECTIVE – I

Sl. No.	Course-Code	Course-Name
1.	CSIT 641	XML Applications
2.	CSIT 642	System Simulation and Modeling
3.	CSIT 643	Image Processing
4.	CSIT 644	Genetic Algorithms
5.	CSIT 645	Object Oriented Modeling

ELECTIVE – II

Sl. No.	Course-Code	Course-Name
1.	CSIT 651	Distributed Systems
2.	CSIT 652	Computing and Complexity Theory
3.	CSIT 653	Parallel Algorithms
4.	CSIT 654	Network Survivability
5.	CSIT 655	Cryptography & Network Security

ELECTIVE – III

Sl. No.	Course-Code	Course-Name
1.	CSIT 661	Mobile Communication
2.	CSIT 662	Real Time Systems
3.	CSIT 663	Object Oriented Database Management Systems
4.	CSIT 664	Soft Computing
5.	CSIT 665	Cloud Computing

Semester-I

PROFESSIONAL COMMUNICATION – I

Sub. Code: LNG-302

Credits 3 (2-1-0)

1. **Study of selected Literacy Texts.**
 - i. Collection of short essays.
 - ii. Collection of short stories.
2. **Testing Written Comprehension Ability.**

Comprehension Passages of 500 words
Multiple Choice Questions.
3. **Composition & Grammar.**
4. **Report Writing**

Characteristics of Business Reports.
Structure of reports: Front Matter, Main Body, and Back Matter
Style of Reports: Definition, the Scientific Attitude, Readability of Reports, Choice of Words and Phrases, Construction and length of sentences, Construction and length of Paragraphs. The lineout or break up of a format report Blank Form Report, Frogen Report, Memoranda Form Report, Periodic Report, Miscellaneous Report.
5. **Speech Drills**

Using the language laboratory to develop Speaking Communication Skills.

 - (i) Word Accent: Production of correct accentual patterns involving two and three syllabi words.
 - (j) Rhythm: Stress-tone rhythm in sentences.
 - (k) Intonation: Rising Tone and Talking Tone Ear Training and Production Tests.

References:

1. Close R.A.: A University Grammar of English Workbook. Longman, London, 1998.
2. Jones, Daniel: English Pronouncing Dictionary, ELBS, and London, 1999.
3. Sharma S.D: A Textbook of Spoken and Written English, Vikas, 1994.
4. Alvarez, Joseph A.: The Elements of Technical Writing, New York: Harcourt, 1998.
5. Bansal, R.K.: Spoken English For India, Orient Longman, 1993.

ENGINEERING CHEMISTRY

Sub Code: CHEM-513

Credit 5 (3-1-2)

1. General Chemistry

Advanced Theory of Chemical Bonding: Valence bond and molecular orbital theory. Structure of NH_3 , H_2O , SO_3 , PCl_5 , XeO_2 molecules. Theories of bonding in metals and semiconductors, n-type and p-type semi-conductors, Imperfections in materials. Born-Haber cycle, Bragg's conditions.

2. Physical Chemistry

Equilibrium on Reactivity: Bronsted and Lewis Acids, pH, pka, pkb Scale, Buffer solution. Stereochemistry of organic compounds, Co-ordination chemistry, Nomenclature, Valence Bond and crystal field theory.

Chemical Kinetics & Catalysis: Rate law, Order of reactions, Parallel and reversible reactions, Catalysis, Homogeneous and heterogeneous catalysis, Characteristics of catalytic reaction, Catalytic promoters and poi-sons, Auto catalysis and negative catalysis, Intermediate compound formation theory and absorption theory.

3. Environment Chemistry

Atmospheric Chemistry & Air Pollution: Environment and Ecology, Environmental segments, Structure and composition of atmosphere, Radiation Balance of Earth and Green House Effect, Formation and depletion of Ozone layer, Chemical and photochemical reactions of various species in atmosphere, Air pollution – sources, reactions and sinks for pollutants, Acid rains and Smog formation. Pollution control methods.

Corrosion and Lubrication: Introduction, causes of corrosion, Theories of corrosion, Factors influencing Corrosion, Corrosion inhibitors, passivity, Types of corrosion, Protection from corrosion and protective coatings. Theory, Classification and mechanism of Lubrication.

4. Applied Chemistry

Water and Waste Water Chemistry: Introduction, Hardness of water, characteristics imparted by impurities, Analysis of contaminants, Treatment of Water by Zeolite, L-S process, Boiler feed water, Waste water treatment.

5. Chemistry of Engineering Materials

Fuels & Combustion: Classification of fuels, Non conventional Energy, Biogas, Biomass and solar energy. Calorific value- gross and net, characteristics of good fuel, Determination of calorific value, Solid fuels, Analysis of coal, Liquid fuels.

Instrumentation: IR, UV, NMR, MASS AND ASS.

6. Industrial Chemistry

Polymer Chemistry: Classification of Polymers, Including Biopolymers condensation and addition polymers and their applications. Industrial

Application and mechanism of chemical reaction, Beckman, Hoffman, Reimer Tiemann, Cunnizzaro, Diels Alder and Skraup synthesis.

References:

1. Puri and Sharma/Principles of Physical Chemistry.
2. Manas Chandra/Atomic Structure and Chemical Bond.
3. Bahl and Tuli /Engineering Chemistry.
4. Jain and Jain/A Text-Book of Engineering Chemistry
5. S.S Dara/Environmental Chemistry and Pollution Control.
6. S.S Dara /Environmental Chemistry.
7. A.K De/Environmental Chemistry.

LIST OF EXPERIMENTS (ANY TEN):

1. To determine the percentage of available chlorine in the supplied sample of Bleaching powder.
2. To determine the Ferrous content in the supplied sample of iron ore by titrimetric analysis against standard K^+Cr^6 solution using $\text{K}_2\text{Fe}(\text{CN})_6$ as external indicator.
3. To determine the chloride content in supplied water sample using Mohr's method.

4. To determine the constituents and amount of alkalinity of the supplied water sample.
5. To determine the Temporary and Permanent hardness of water sample by Coplexometry.
6. To find the Chemical Oxygen Demand of a waste water sample using Potassium dichromate.
7. To determine iron concentration in the sample of water by spectrophotometric method.
8. To find out the Velocity constant for the inversion of cane sugar in acidic medium and to show that inversion follows the first order kinetics.
9. To determine the Molecular weight of a polystyrene sample by using Viscometer method.
10. To determine pH of a solution using a pH-meter and titration of such a solution pH-metrically.
11. To determine the calorific value of a fuel sample by using a Bomb Calorimeter.
12. Analysis of a coal sample by proximate analysis method.

References:

1. Vogel's Qualitative Chemical Analysis: Ed. By Jaffery Bassette et. al. (ELBS).
2. Applied Chemistry- Theory and Practice, 2nd Ed. By Virmani and Narula (New Age International Pub.).
3. Experiments in Engineering Chemistry, Ed. By Masood Alam (Maktaba Jamia Limited).

ENGINEERING MATHEMATICS – I

Sub. Code: MAS-411

Credit 4(3-1-0)

Matrices

Elementary row and column transformations, Linear dependence, Rank of matrix, Consistency of system of linear equations and solution of linear equations, Characteristic equation, and Caley-Hamilton theorem, Eigen values and eigen vectors, Diagonalisation, Complex and unitary matrices.

Differential Calculus-I

Leibnitz theorem, Partial differentiation, Euler's theorem, Asymptotes, Curve tracing, Change of Variables, expansion of functions of one and several variables. Cylindrical and spherical coordinate systems

Differential Calculus-II

Jacobian, Approximation of errors, Extrema of function of several variables, Lagrange's method of multipliers (simple applications).

Multiple integrals

Double and triple integrals, change of order, change of variables, Gamma & Beta functions, application to area, volume, Dirichlet's integral and its applications.

Vector Calculus

Point functions, Gradient, divergence and curl of a vector and their physical interpretations, line, surface & volume integrals, Gauss divergence theorem and Greens & Stokes theorem.

References:

1. Shanti Narayan: A Text Book of matrices, S.Chand & Co.
2. Thomas/Finney: Calculus and Analytic Geometry, Narosa Pub. House.
3. J. N. Kapur: Mathematical Statistics, S. Chand & Co.
4. C. Prasad: Mathematics for Engineers, Prasad Mudranalaya.
5. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers.
6. Jaggi & Mathur : Advanced Engineering Mathematics, Khanna Publishers.
7. Piskunov, N.: Differential & Integral Calculus, Moscow Peace Pub.
8. H.K. Das, Engineering Mathematics.
9. Vijai Shankar Verma & Sanjeev Kumar, Engineering Mathematics.
10. Rakesh Dubey, Engineering Mathematics

ELECTRICAL ENGINEERING

SUB CODE: EE-302

CREDIT 5 (3-0-2)

1. Sinusoidal Steady State Circuit Analysis

Voltage, Current, Sinusoidal & Phasor representation. 1-Phase A.C. Circuit-behavior of resistance, Inductance and Capacitance and their combinations, impedance, concept of power, power factor, series & parallel resonance-bandwidth and quality factor.

2. Network Theory

Introduction to basic physical laws, Network theory: Superposition, Thevenin, Norton, Maximum Power transfer theorems, Star-delta transformation, Circuit theory Concepts: Mesh and Nodal analysis.

3. Three Phase Supply

Star/delta connections, line and phase voltage/current relations, Three-phase power and its measurement.

4. Basic Instruments

Instruments for measurement of voltage, Current, power and energy: Construction, principle and application.

5. Magnetic Circuit and Transformer

Magnetic circuit concept, theory and working principle of single-phase transformer.

6. Rotating Machines

Principles of energy conversion, Basic concepts of rotating machines, DC machines, Different types and their characteristics & applications. Elementary idea of operation of synchronous and induction machines. Single-phase induction & stepper motors, Applications.

7. Power Systems

Introduction, Elements, Line diagram, Supply systems, Power factor improvement.

Reference:

1. V. Del Toro/ Principles of Electrical Engineering/ PHI.
2. W.H Hayt & J.E Kennedy/ Engineering Circuit Analysis/ McGraw Hill.
3. I.J Nagrath/ Basic Electrical Engineering/ Tata McGraw Hill.
4. A.E Fitzgerald/ Electronic Instruments & Measurement Techniques/ PHI.
5. Higginbotham L.Grabel/Basic Electrical Engineering/ McGraw Hill.

LIST OF PRACTICALS

A minimum of 10 experiments from the following:

1. Verification of Thevenin's Theorem.
2. Verification of Superposition Theorem.
3. Verification of Norton's Theorem
4. Verification of Kirchoff's Law.
5. To measure the value of impedance and power factor in RLC series A.C. circuit.
6. To measure the value of impedance and power factor in RLC parallel A.C. circuit.
7. To study resonance by frequency variation in series RLC circuit.
8. To calibrate the given energy meter with the help of a standard wattmeter.
9. To find the relation between line current and phase current and line voltage and phase voltage in Star – Delta connections.
10. To perform open circuit and short circuit test and draw the equivalent circuit of a single-phase transformer.
11. To measure three phase power by two-wattmeter method.
12. To draw the magnetizing characteristic of a single-phase transformer.

BASIC ELECTRONICS

SUB CODE: ECE-301

CREDITS 4 (2-1-2)

1. Energy Bands in Solids:

Energy band theory of solids, Concept of forbidden gap, Insulators, Metals and Semiconductors.

2. Transport Phenomenon in Semiconductors:

Mobility and conductivity, electrons and holes in an intrinsic semiconductor, Donor and acceptor impurities, Fermi level, carrier densities in semiconductor, electrical properties of semiconductor, Hall effect, Diffusion.

3. Junction Diode:

P-N junction, depletion layer, V-I characteristics, diode resistance, capacitance, switching time, diode application as a rectifier (half wave and full wave), diode circuits (clipper, clamper, voltage multipliers) Breakdown mechanism, Zener & Avalanche, breakdown characteristics, Zener diode and its applications.

4. Bi-junction Transistor:

Bipolar junction Transistor, CE, CB and CC configuration, characteristic curves (cut off, active and saturation region), Requirement of biasing, biasing types and biasing analysis, stability.

5. Transistor as an Amplifier:

Graphical analysis of CE amplifier, concept of voltage gain, current gain and power gain, h-parameter (low frequency), computation of A_v , R_i , R_o and approximate formulae.

6. Operational Amplifiers:

Concepts of ideal op-amp, inverting, non-inverting and unity gain amplifiers, adders, difference amplifiers, Integrators.

7. Switching Theory & Logic Gates:

Number systems, conversion of bases, Boolean algebra, Logic Gates, concept of universal gate, canonical forms, and minimization using K-map.

8. Electronic Instruments:

Multimeter, CRO and its Applications.

References:

1. Boylestad & Nashelsky/Electronic Devices & Circuits/ PHI.
2. Morris Mano/Digital Computer Design/ PHI.
3. Milliman, J. Halkias/Integrated Electronics/TMH.
4. Malvino & Leach/Digital Principles & Application/

List of Experiments:

1. Study of Diode characteristics.
2. Study of Common Base Transistor characteristics.
3. Study of Common Emitter Transistor characteristics.
4. Study of Half Wave Rectifier with effect of Capacitor and also calculate the ripple factor.
5. Study of Full- Wave Rectifier with effect of Capacitor and also calculate the ripple factor.
6. Study of Various Logic Gates.
7. Study of Clipping and clamping Circuits.
8. Study of C.R.O., Function generator, Multimeter.

ENGINEERING GRAPHICS-I

SUB. CODE (ME-301)

CREDIT 2(0-0-4)

1. Introduction

Graphics as a tool to communicate ideas, engineering drawing instruments and its uses. Lettering and dimensioning, scales, layouts of drawing sheets Construction of geometrical figures like pentagon and hexagon.

2. Orthographic Projection

Principles of orthographic projections, Principal and auxiliary planes, First and Third angle projections. Projection of points. Pictorial view. Projection of lines parallel to both the planes. Parallel to one and inclined to other, Inclined to both the planes. Application to practical problems. Projection of solid in simple position, Axis or slant edge inclined to one and parallel to other Plane, Solids lying on a face or generator on a plane. Sectioning of solids lying in various positions, True shape of the section. Development of lateral surfaces, sheet metal drawing.

3. Isometric Projection

Principles of isometric projection, Isometric projection using box and offset methods.

References:

1. Bhatt N.D.: Elementary Engineering Drawing, Charothar Publishing.
2. Laxmi Narayan V & Vaish W.: A Text Book of Practical Geometry on Geometrical Drawing.

MORAL AND VALUE EDUCATION

SUB CODE (GPT - 301)

CREDITS 2 (2-0-0)

My country and my people, the many Indians, being and becoming an Indian, nationalism and internationalism.

Some life issues- love, sex and marriage, men and money-value of time, meaning of work, human communication, human suffering, addiction, ecology, women's issues.

Understanding one's neighbour, neighbourhood groups: their structure and functions, Patterns of social interaction of group dynamics.

Preparation for a career, choice of vocation, motivation for study and research. The present educational system: curriculum and syllabus, teaching methods, examination and work experience.

Definition of value education, moral and ethics, laws and morale based on ten commandments and two great commandments.

Discovery of self, self-awareness, growth of intellect- man's spiritual nature emotions, will, respect, the rights of life, liberty, property, truth and reputation.

Sin, origin of sin, manifestation of sin, the results of sin, the remedy of sin, sin as an act, Sin as a state, sin as a nature.

Conscience- as defined in oxford dictionary and Winston dictionary. Types of consciousness (such as Evil, convicted, purged, pure, weak, good, void of offence).

Semester-II
PROFESSIONAL COMMUNICATION II

Sub. Code (LNG-303)

Credit 3 (2-1-0)

1. Technical Written Communication

- (a) Nature, origin and development of technical written communication.
- (b) Salient Features.
- (c) Difference between technical writing and general writing.

2. Pre-requisites of Scientific and Technical Communication

- (a) Fragment sentences.
- (b) Parallel comparisons.
- (c) Elements of a series.
- (d) Squinting construction and split infinitive.
- (e) Modifiers, connectives, antecedents and clause subordination.
- (f) Dangling participles and gerunds.
- (g) Ellipsis.
- (h) Coherence, Unity, Chronological method, spatial method, inductive method, linear method, deductive method, interrupted method.

3. Business Correspondence

- (a) General principles of business correspondence.
- (b) Ramifications of business letters.
- (c) Letters giving instructions, inquiries and answers to enquiries, complaints and adjustments, letters urging action, employment letters, application and resumes.

4. Proposal Writing

- (a) Proposal: Definitions and kinds.
- (b) Division of format proposals (front matter, title page, summary/ abstract, Table of contents etc.)
- (c) Statement of request, body- statement of problem, background, scope, methodology, Advantages and disadvantages.

5. Writing Scientific and Semi-technical Articles

- (a) Source material, topic sentence, literature review.
- (b) Tables, figures, footnotes, bibliography.

6. Study of Scientific and General Texts.

- (A). Prescribed text books for detailed study
 - Arora, V.N (et. al.), Improve your writing (Delhi: Oxford University Press, 1981).
 - Lesson No. 1.2, 1.6, 2.4, 3.5, 4.1, 4.3, 5.1, 5.4, 6.2.
- (B). For extended Reading (any one of the following)
 - Orwell George, Nineteen Eighty Four (New York: Penguin, 1984)
 - Hemingway, Ernest, The old man and the Sea, (Oxford: 1990)

7. Listening Comprehension

- (a). Ear-training.
- (b). Uses of latest scientific techniques (AVR Comprehension trainer, SRA Comprehension trainer, SRA Comprehension Accelerator, AVR Comprehension Reteometer.)

8. Reading Comprehension.

- (a) Scanning method.
- (b) Skimming method.

9. Phonetic Transcription

10. Stresses and Intonation.

References

- Sherman, Theodore A. (et al) Modern Technical Writing, New Jersey, Prentice Hall, 1991.
- Legget, Glenn (et al) Essentials of grammar and composition, Macmillan, Delhi 1994.
- Strunk, Jr. William (et al), The elements of style, Macmillan, 1987.
- Sharma, S.D A Text Book of Scientific and Technical Writing, Vikas, Delhi, 1990.

MATHEMATICS –II

Sub. Code: MAS-490

Credit 4 (3-1-0)

1. Differential Equations

Ordinary differential equations of first order, exact differential equations, Linear differential equations of 1st order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solution of second order differential equation by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems(without derivation).

2. Series Solution & Special Functions

Series solutions of ODE of 2nd order with variable coefficients with special emphasis to the differential of legendre and Bessel. Legendre's polynomials, Bessel's functions and their properties.

3. Laplace Transform

Laplace transform, Existence theorem, Laplace transform derivatives and integrals, Inverse Laplace transform, Unit-step function, Dirac Delta function, Laplace transform of periodic functions, convolution theorem Applications to solve simple linear and simultaneous differential equations.

4. Fourier Series And Partial Differential Equations

Periodic functions, Trigonometric series, Fourier series of functions with period 2π , Euler's formulae, functions having arbitrary period, even and odd functions, change of interval, half range sine and cosine series. Introduction to partial differential equations, linear partial differential equation with constant coefficients of 2nd order and their classifications, parabolic, elliptic & hyperbolic with illustrative examples.

5. Application of Partial Differential Equations

Method of separation of variables for solving partial differential equation, Wave equation up to two dimension, Laplace equation in two dimension, Heat conduction equations up to two dimension, Equation of transmission Lines.

References:

1. E. Kreyszig: Advanced Engineering Mathematics, Wiley Eastern Ltd.
2. B.S Grewal: Higher Engineering Mathematics, Khanna Publishers.
3. Jaggi & Mathur: Advanced Engineering Mathematics, Khanna Publishers.
4. C. Prasad: Advanced Mathematics for Engineers, Prasad Mudranalaya.

ENGINEERING MECHANICS

Sub. Code (CE-401)

Credit 3 (2-1-0)

1. Force and Equilibrium

Basic concepts, Force, Moment and couple, Principle of Transmissibility, Varignon's theorem, Resultant of Force Systems concurrent and Non-concurrent coplanar Forces, Funicular polygon. Free body diagram.

2. Trusses

Plane structures, Various methods of analysis of Trusses, Method of joints, Method of sections and Graphical method.

3. Moment of Inertia

Center of gravity, centroids of Line, Area, volume and Composite Bodies, Area Moment of Inertia and Mass Moment of Inertia for plane figures and bodies including composite bodies, Product Moment of inertia, Parallel axis theorem, Principal moment of inertia.

4. Friction

Introduction, Dry friction, Co-efficient of static friction. Friction cone, screw jack and Belt friction.

5. Beams

Bending moment and shear force diagrams for statically determinate beams.

6. Kinematics of Rigid Bodies

Plane motion, Absolute motion, Relative motion, Translating axes and Rotating axes.

7. Kinetics of Rigid Bodies

Plane motion, Force Mass and Acceleration, Work and energy, Impulse and momentum, Principles of energy conservation, Principle of virtual work, D'Alembert's principle and Dynamic equilibrium.

References:

1. Beer F.P and Johnston F.R: Mechanics for Engineers, McGraw Hill.
2. Meriam, J.L: Statistics, John Wiley.
3. Meriam, J.L: Dynamics, John Wiley.
4. Shames I.H: Engineering Mechanics, Prentice Hall of India.
5. Dayaratnam, P.: Statistics, Tata Mc Graw Hill.
6. Timoshenko, S. and Ypung D.: Engineering Mechanics, Mc Graw Hill.

COMPUTER & LANGUAGES

Code: CSIT-401

Credit: 4(2+1+2)

UNIT- 1

Introduction to Computers

- Need and Role
- Definition, Characteristics and Applications
- Hardware: Basic block diagram & components
- Software: System & Application

UNIT- 2

Information Concepts

- Data & its representation
- Introduction to Database

Operating System

- Introduction, Functions
- Working with DOS, Windows and Linux

Computer Networks & Internet

- Introduction
- Types
- OSI reference model
- Internet: History, usage and applications

UNIT- 3

Computer Languages

- Generations
- Translators(Assembler, Interpreter and compiler)

Programming Techniques

- Programming constructs
- Algorithms & Flowcharts

UNIT- 4

'C' Language

- Introduction
- History
- Character set
- Expressions & Operators
- Input/Output Statements
- Control Statements
 - Branching Statements (if, if-else, Nested if), switch
 - Looping Statements (while, do-while, for)

UNIT- 5

'C' Language

- Arrays
- Functions
- Introduction to pointers and structure
- Structured Programming & Software development

References:-

- J.B. Dixit, "Fundamentals of Computers & Programming in 'C' ",Laxmi Publications(P) Ltd.
- Yashavant Kanetkar, "Let us C", BPH Publications
- E. Balaguruswamy, "ANSI C", TMH

Practical List (CSIT-401)

Operating System

Working with Dos commands

Windows and its applications
Linux commands and Editors

'C' Programming

Draw flow chart and write C program for the following:

1. To find the largest among three numbers
2. To check whether a given string is a palindrome or not.
3. To find factorial of a given number by iteration.
4. To find whether the given integer is
 - (i) a prime number
 - (ii) an Armstrong number.
5. To find sum of n terms of series:
6. $n - n*2/2! + n*3/3! - n*4/4! + \dots$
7. To find sum and average of n integers using a linear array.
8. To read n numbers from the keyboard and display these numbers in the reverse order their entry.
9. To sort a given list using either selection or bubble sort.
10. To search a given number within a linear array.
11. To perform Addition, Multiplication, Transpose of matrices.
12. To generate the fibonacci series using a function.
13. To find factorial of a given number using a function.
14. To interchange two values using
 - i. i) Call by value.
 - ii. ii) Call by reference.
15. Write a C program to display the mark sheet of a student using structure.

WORKSHOP PRACTICE & TECHNOLOGY

Sub. Code (ME-304)

Credit 4 (2-0-4)

1. Introduction

Classification of manufacturing processes, Primary shaping process, Machining processes, Joining processes, Surface finishing processes, Plant & Shop layout, Industrial Safety.

2. Properties of Metals

Strength, Elasticity, Stiffness, Plasticity, Malleability, Ductility, Brittleness, Toughness, Hardness, Impact strength, Fatigue, Creep.

3. Classification of Metals

Wrought iron, Cast iron, Grey cast iron, White cast iron, Nodular cast iron, Alloy cast iron, Steel, Mild steel, Medium Carbon steel, High carbon steel and its application. Effect of alloying elements on steel, Special alloy steels, e.g. stainless steel, high speed steel, cutting alloys.

4. Non-ferrous Metals

Aluminium, Copper, Zinc, Lead, Tin, Nickel, Non-ferrous alloys, Brass, Bronze.

5. Carpentry Shop

Introduction, Selection of timber, Seasoning of Timber, Common defects in timber, Preservation of timber, Auxiliary materials used in carpentry, Veeners and Veneering, Plywood, Wood working hand tools, Marking and measuring tools, Holding & Supporting tools, Cutting tools, Saws, chisel, Planers, Boring tools, Wood working processes, Joinery work classification of joints.

6. Bench Working & Fitting Shop

Introduction, Vices, Vice blocks, Surface plates, Trisquare, Bevel square, Combination set files, Chisel, Hacksaw, Surface gauge, Universal surface gauge, Punches, Calipers, Dividers, Pliers, Spanners, Drills taps. Die and die stock. Screw pitch gauge, Wire gauge, Dial indicator, Bench working processes.

7. Welding Shop

Concept of welding, Resistance welding, Spot welding resistance butt and flash welding, Resistance projection welding and seam welding, Electric arc welding, Gas welding (Oxy-Acetylene welding), Equipments and process, welding joints and positions of welding.

8. Sheet Metal Shop

Introduction, Metals used in sheet metal shop hand tools, Sheet metal operations.

List of practical:

1. To make a T-lap carpentry joint.
2. To make the wooden block of given size with the help of planning - to make a square slot, to make a semi circular arc.
3. To make an S-hook.
4. Metal practice- Filing, hack sawing, drilling, tapping.
5. To make a book stand.
6. To make a butt joint with the help of electric arc welding.
7. To make a lap joint with the help of electric arc welding.
8. To study and sketch the Lathe Machine.

ENGINEERING GRAPHICS – II

Sub. Code (ME-401)

Credit 2 (0-0-4)

1. **Introduction:**
Graphic language, Classification of drawings, Principles of drawing: IS codes for Machine drawing, Lines, Sections, Dimensioning, Standard abbreviation.
2. **Orthographic Projections**
Principles of first and third angle projections, drawing and sketching of machine elements in orthographic projections, spacing of views.
3. **Screwed (Threaded) Fasteners**
Introduction, Screw thread nomenclature, Forms of threads, Thread series, Thread designation. Representation of threads, Bolted joints, Locking arrangements for nuts, Foundation bolts.
4. **Keys and Cotters**
Keys, Cotter joints.
5. **Shaft Couplings**
Introduction, Rigid and flexible coupling.
6. **Riveted Joints**
Introduction, Rivets and riveting, Rivet heads, Classification of riveted joints.
7. **Assembly Drawing**
Introduction, Engine parts, Stuffing box etc.
6. **Free Hand Sketching**
Need for free hand sketching, Free hand sketching of some threaded fasteners and simple machine components.

References:

1. N. Siddeshwar, P. Kannaiah, V.V.S Shastri: Machine Drawing, TMH, New Delhi.
2. K.L Narayana, P. Kannaiah, K. VenkatReddy: Machine Drawing, New Age International Publications, 2nd edition.
3. Engineering drawing practice for schools and colleges, SP 46-1998(BIS).

SEMESTER - III

PRINCIPLES OF PROGRAMMING LANGUAGES

Code: CSIT-409

Credits: 4 (3 –1-0)

UNIT -I

Introduction: Characteristics of Programming Languages, Factors influencing the evolution of programming language, developments in programming methodologies, desirable features and design issues. Programming Language Processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.

UNIT -II

Elementary and Structured Data Types: Data object variables, constants, data types, elementary data types, declaration, assignment and initialization, enumeration, characters, strings. Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Sets, files. Sub Program and programmer defined data types: Evolution of data types, abstractions, encapsulations, information hiding, sub programs, abstract data types.

UNIT -III

Sequence Control: Implicit and Explicit sequence control, sequence control with and within expression and statements, recursive sub programs, exception handling, co routines, Scheduled sub programs, concurrent execution.

UNIT -IV

Storage Management: Major run time requirements, storage management phases, static storage management - stack based, heap based.

Syntax and translation: General syntactic criteria, syntactic elements of a language, stages in translation, formal syntax and semantics.

UNIT -V

Programming Environment: Embedded system and its requirements, Introduction to Functional Programming, Lambda calculus, Data flow language and Object Oriented language.

Text Book(s):

Terrance W Pratt, "Programming Languages: Design and Implementation" PHI

Reference Books :

1. Sebesta, "Concept of Programming Language", Addison Wesley
2. E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley
3. Dr. Sachin Kumar, "Paradigms of Programming", Katson Books
4. Udit Agrawal, "Paradigms of Programming Languages", Dhanpat Rai & Co.

DATA STRUCTURES USING 'C'

Code: CSIT 410

Credits: 5 (3- 1- 2)

Unit - I

Introduction: Basic Terminology, Elementary Data Organization, Structure operations, Algorithm Complexity and Time-Space tradeoff.

Arrays: Basic Concepts, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays- Sparse Matrices and Vectors.

Stacks: Basic Concepts, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression.

Recursion: Basic concepts, recursion in C, example of recursion, Tower of Hanoi, recursive algorithms, principles of recursion.

UNIT - II

Queues: Introduction, Operations on Queues- Insert, Remove, Array and linked representation and implementation of queues, Circular queues, Dequeue and Priority Queues.

Linked List: Introduction, Basic Operations, Singly Linked list, Representation and Implementation of Linked Lists, Doubly Linked list, Circular Linked list, Header Linked list, Application of linked list: Polynomial representation and addition.

UNIT – III

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Traversing Threaded Binary trees.

Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, AVL and B-trees.

UNIT – IV

Sorting: Introduction, Comparison Based Sorting- Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Non-Comparison Based Sorting- Counting sort.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies.

UNIT - V

Graphs: Terminology & Representation Techniques of graph, Graph Traversal Techniques, Minimum Cost Spanning Trees: Prim's and Kruskal's algorithms, Shortest path algorithms.

Text books:

1. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., New Delhi.
2. A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.

Reference books:

1. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia
2. K Loudon, "Mastering Algorithms With C", Shroff Publisher & Distributors Pvt. Ltd.
3. Bruno R Preiss, "Data Structures and Algorithms with Object Oriented Design Pattern in C++", Jhon Wiley & Sons, Inc.

PRINCIPLES OF OPERATING SYSTEMS

Code : CSIT 414

Credits: 5(3-1-2)

Unit –I: Introduction

Functions of Operating System, Evolution of Operating System, Batch, Interactive, Time Sharing and Real Time System, System Protection. Operating System Structure: System Components, System Structure, Operating System Services.

Unit – II: Process Management

Concurrent Processes: Process Concept, Principle of Concurrency, Producer / Consumer Problem, Critical Section, Problem, Semaphores, Classical Problems in Concurrency, Inter- Process Communication, Process Generation, Process Scheduling.

CPU Scheduling: Scheduling Concept, Performance Criteria, Scheduling Algorithms, Multiprocessor Scheduling. Deadlocks: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from Deadlock.

Unit – III: Memory Management

Basic Machine, Resident Monitor, Multiprogramming with Fixed Partition, Multiprogramming with Variable Partition, Multiple Base Register, Paging, Segmentation, Paged Segmentation, Virtual Memory Concept, Demand Paging, Performance, Page Replacement Algorithms, Allocation of Frames, Thrashing, Cache Memory Organization, Impact on Performance.

Unit – IV: File Management

I/O Management & Disk Scheduling: I/O Devices and Organization of I/O Function, I/O Buffering, Disk I/O, Operating System Design Issues.

File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues.

Unit – V: Case Study

Linux Operating System: Introduction to Linux Commands, Shell Programming, Basic System Calls, Kernel Models, File system, Security.

Text Book(s) :

1. Silberschatz, Peterson J, "Operating System Concepts", Willey.
2. Milenekovic, "Operating System Concept", McGraw Hill.

Reference Books:

1. Petersons, "Operating Systems", Addison Wesley.
2. Dietal, "An Introduction to Operating System", Addison Wesley.
3. Tannenbaum, "Operating System Design and Implementation", PHI.
4. Gary Nutt, "Operating System, A Modern Perspective", Addison Wesley.
5. Stalling, Willium, "Operating System", Maxwell Macmillan
6. Crowley, "Operating System", TMH.

WEB TECHNOLOGIES

Code : CSIT-413

Credits : 4(2-1-2)

UNIT-I

Introduction: World Wide Web, Communicating on the Internet, Internet Domains, Web Server, Web Browser, IP Address, DNS, ISP, FTP, Telnet, HTTP, TCP/IP.

UNIT-II

HTML: Introduction, Text Formatting, Lists, Adding Graphics, Tables, Linking Documents, Frames, Forms.

DHTML: Cascading Style Sheet: Font Attributes, Color and Background Attributes, Text Attributes, Border Attributes, Margin Attributes, List Attributes, CLASS, Inline Style Sheet, Document Level Style Sheet, External Style Sheet.

UNIT-III

JavaScript: Advantages, Basic Programming Techniques, Operators, Branching and Looping Statements, Arrays, Functions, Dialog Boxes, JavaScript DOM: Event Handling, User-defined Objects, Built-In Objects.

UNIT IV

XML: Introduction, Displaying an XML Document, Data Interchange with an XML document, Document type definitions, XML Schema, XML DOM, Applications of XML

UNIT V

Active Server Pages (ASP): Introduction, Basic Programming Constructs, Session Management, Creating Cookies, ASP Objects, Connecting Database.

Text Books

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Sharma & Sharma, "Developing E-Commerce Sites", Addison Wesley
3. Ivan Bayross, "Web Technologies Part II", BPB Publications.

References Books:

1. Shishir Gundavarma, "CGI Programming on the World Wide Web", O'Reilly & Associate.
2. DON Box, "Essential COM", Addison Wesley.
3. Greg Buczek, "ASP Developer's Guide", TMH.

DISCRETE MATHEMATICS

Code: MAS 621

Credits: 3(3-0-0)

1. Propositions and logical operations

- a. Notation, Connections, Normal Forms, Truth Tables
- b. Equivalence and Implications
- c. Theory of inference for statement calculus, predicate calculus
- d. Rules of logic
- e. Mathematical Induction and Quantifiers

2. Sets, Relations and Digraphs

- a. Review of set concepts
- b. Relations and digraphs
- c. Properties of relations
- d. Equivalence relations
- e. Computer representation of relations and digraphs
- f. Manipulation of relation
- g. Partially Ordered Sets (Posets)

3. Graph theory

- a. Definition, paths, circuits, reachability, connectedness
- b. Matrix representation of graphs, trees, spanning trees
- c. List structures and graphs, PERT related techniques
- d. Transitive closure, Warshall's Algorithms
- e. Eulerian and Hamiltonian graphs

4. Groups and applications

- a. Monoids, semigroups
- b. Product and quotients of algebraic structures
- c. Isomorphism, homomorphism, automorphism
- d. Normal subgroups, codes and group codes

Text Books:

1. Discrete Mathematical Structure : Tremblay and Manohar, McGraw Hill
2. Discrete Mathematical Structure : Kolman, Busby and Ross, Printice Hall India
3. Elements of Discrete Structures : C.L. Liu

SEMESTER - IV

OBJECT ORIENTED PROGRAMMING

Code : CSIT 415

Credits : 5(3-1-2)

Unit I

Introduction to Object Oriented Programming : Introduction, structured versus object-oriented development, elements of object-oriented programming, objects, classes, multiple views of an object, encapsulation and data abstraction, software reuse.

Unit II

Object Modeling: Objects and Classes, Links and Associations, Generalization, Inheritance, Aggregation, Abstract Classes, Generalization as Extension and Restriction, Multiple Inheritance, Metadata, Candidate Keys, Constraints.

Unit III

Dynamic Modeling: Events and States, Operations, State Diagrams, Concurrency, Advanced Dynamic Modeling Concepts- Entry and Exit Actions, Internal Actions, Automatic Transitions, Sending Events, Synchronization of Concurrent Activities.

Functional Modeling: Functional Models, Data flow Diagrams, Specifying Operations, Constraints, Relation of Functional models to Object and Dynamic Models.

Unit IV

Basic C++ Concepts: Classes and objects in C++, Constructors, Destructors, Function overloading, Operator overloading, Friend Function.

Unit V

Advance C++ Concepts: Inheritance, Abstract Classes, Virtual Base Classes, Pointers, Virtual functions, Polymorphism, Exception Handling, Template Classes, Introduction to STL.

Translating object oriented design into an implementation.

Text Books:

1. Rambaugh James etal, "Object Oriented Design and Modeling", PHI-1997
2. Balagurusamy E, "Object Oriented Programming with C++", TMH, 2001

Reference Books :

1. Bjarne Stroustrup, "C++ Programming Language", Addison Wesley
2. Booch Grady, "Object Oriented Analysis and Design with application 3/e", Pearson
3. Lipman, Stanley B, Jonsce Lajole, " C++ Primer Reading", AWL, 1999
4. Dillon and Lee, "Object Oriented Conceptual Modeling", New Delhi PHI-1993
5. Stephen R. Shah, "Introduction to Object Oriented Analysis and Design", TMH

COMPUTER ORGANIZATION

Code: CSIT 412

Credits: 5(3-1-2)

UNIT-I

Introduction: An overview of Digital Computers: Organization, Design and Architecture.

Register Transfer and Microoperations: Register Transfer Language, Bus and Memory Transfers, Bus Architecture. Arithmetic, Logic and Shift Microoperations, Arithmetic Logic Shift Unit.

UNIT-II

Basic Computer Organization: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Complete Computer Descriptions.

Control Unit: Hardwired & Microprogrammed control unit, Design of microprogrammed Control unit.

UNIT-III

Processor Organization: General register organization, Stack organization, Addressing modes, Instruction formats, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

Arithmetic Algorithms: Addition, Subtraction, Booth Multiplication, Division, IEEE standard for Floating-point numbers.

UNIT -IV

Input-Output Organization: Peripheral Devices, I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-Output processor, Serial Communication.

UNIT-V

Memory Organization: Memory Hierarchy, Main Memory (RAM and ROM Chips), Auxiliary memory, Associative Memory, Cache memory, Virtual Memory, Memory management hardware.

Text Books:

1. Computer System Architecture, M. Mano(PHI)
2. Computer Organization, Stallings (PHI)

Reference Books:

1. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
2. Structured Computer Organization, Tannenbaum(PHI)
3. Computer Organization, John P.Hayes (McGraw Hill)

PRINCIPLES OF DATABASE MANAGEMENT SYSTEMS

Code: CSIT 411

Credits: 5(3+1+2)

UNIT- I

Introduction: An overview of database management system, database system Vs file system, Database system concepts and architecture, data models, schema and instances, data independence and data base languages, Data definitions language, DML, Overall Database Structure.

Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model.

UNIT- II

Relational Data Model and Languages: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus,

Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, Views and Indices, Queries and sub queries, Aggregate functions, Insert, update and delete operations. Set Operations: Union, Intersection, Minus. Join Operations, Cursors in SQL.

UNIT- III

Database Design & Normalization: Need of Normalization, Various Functional dependencies, Normal forms: first, second, third, BCNF, inclusion dependences, loss less join decompositions, normalization using MVD, and JDs, alternative approaches to database design.

UNIT- IV

Transaction Processing Concepts: Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

UNIT- V

Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transactions.

Text books:

1. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
2. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley

Reference books:

1. Date C J, "An Introduction To Database System", Addison Wesley
2. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication
3. Majumdar & Bhattacharya, "Database Management System", TMH
4. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill

DIGITAL COMMUNICATION SYSTEM

Code: ECE-506

Credits: 5 (3-1-2)

Element Of Digital Communication And Information Theory: Model of digital communication system, logarithmic measure of information, entropy and information rate, conditional entropy and redundancy source coding, fixed and variable length code words, source-coding theorem, prefixes doing and Kraft Inequality.

Shannon-Fano and Hoffman coding for 1st, 2nd, 3rd order extension, maximum entropy of continuous source (with Gaussian distribution) entropy of band limited white Gaussian noise, mutual information & channel capacity of the discrete memory less channel, calculation of channel capacity of a discrete memory less channel of BSC, of a continuous AWGN channel, Hartley Shannon law, maximum limit of channel capacity exchange of band and SNR.

Sampling Theory And Pulse Modulation: Sampling Theorem, Signal reconstruction in time domain, Practical and flat top sampling, Sampling of band-pass signal; Types of analog pulse modulation, Method of generation and Detection of PWM, PNM & PPM, Spectra of pulse modulated systems.

Waveform Coding Techniques: Discretization in time and amplitude. Linear Quantizer, Quantization noise power calculation, signal to Quantisation noise ratio, non-uniform Quantizer A law & μ law companding; encoding and pulse code modulation bandwidth of PCM, Differential Pulse Code Modulation using predictor, Delta modulation, Idling noise and slope overload, Quantization noise in DM for sinusoidal modulation, Adaptive Delta Modulation, Demodulation, Comparison of PCM and DM, MPEG audio digital signal standard

Digital Multiplexing: Fundamental of Time division multiplexing, Electronic commutator, Bit, Byte inter leaving, T1 carrier, synchronization and signaling of T1, TDM, PCM hierarchy, North -America * CCITT standards, T1 to T4 PCM TDM system (DS1 to DS4 signals), Signal formats of M12 Mux for AT & T (Bell) system, Bit rate calculation DS1 to DS4 signals.

Digital Base Band Transmission: Line coding and its properties. NRZ & RZ types, signaling format for unipolar, polar, bipolar (AMI) & Manchester coding and their power spectra (no derivation), HDB and B8ZS signaling, ISI, Nyquist criterion for zero ISI and raised cosine spectrum. Matched filter receiver, derivation of its impulse response and peak pulse signal to noise ratio, correlation detector decision threshold and error probability for binary unipolar (on – off) signaling.

Digital Modulation Techniques: Types of digital modulation, Wave forms for amplitude, Frequency and Phase shift keying. Method of generation and detection of coherent and non-coherent binary ASK, FSK & PSK, differential phase shift keying, quadrature modulation techniques, (QPSK & MSK) probability of error and comparison of various digital modulation techniques.

Error Control Coding: Error free communication over a noisy channel, hamming sphere, hamming distance and hamming bound, relation between minimum distance and error detection and correction capability, linear block codes, encoding and syndrome decoding, cyclic codes, encoder and decoders for systematic cycle codes, convolution codes, code tree and Trellis diagram, Viterbi and sequential decoding, Burst error correction, comparison of performance.

References:

1. B.P. Lathi / Modern Analog and Digital Communication / Oxford University Press.
2. Simon Haykin / Digital Communication / John Wiley & Sons.
3. Simon Haykin / Communication Systems (IV Ed) /
4. A.B. Carlson / Communication Systems / TMH.
5. Proakis, J.J. / Digital communication / McGraw Hill.

List of Experiments

1. Study of Sample and hold circuit-using Op-amp.
2. To study PAM generator and observe characteristics of both single and dual polarity pulse amplitude modulation.
3. Study of Pulse Width Modulation and demodulation.

4. Study of Pulse Position Modulation and demodulation.
5. Study of Time Division Multiplexer.
6. Study of Pulse Code Modulation and demodulation.
7. Study of Delta Modulation and demodulation and observe effect of slope overload.
8. Study pulse data coding technique for NRZ formats.
9. Data decoding technique for NRZ formats.
10. Study of amplitude shift keying modulator and demodulator.
11. Study of frequency shift keying modulator and demodulator.
12. Study of phase shift keying modulator and demodulator.
13. Single bit error detection and correction using Hamming code.
14. Simple fiber optic link fabrication using discrete components with available digital data input.
15. Digital link simulation, error introduction and error estimation in a link using MAT LAB (SIMULINK)/ VI.
16. Simulation of switching scheme of 8 line digital exchange using VI.

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

Code : MAS 491

Credits : 4(2+1+2)

Introduction:

Errors in Numerical Computation, Mathematical Preliminaries, Errors and their Analysis, Machine Computations, Computer Software.

Algebraic & Transcendental Equation:

Bisection Method, Iteration Method, Method of False Position, Rate of Convergence, Method for Complex Root, Newton Raphson Method.

Interpolation:

Introduction, Errors in Polynomial Interpolation, Finite Differences, Decision of Errors, Newton's Formulae for Interpolation, Gauss, Stirling, Bessel's formula, Everett's formula, Interpolation by unevenly spaced points, Lagrange's interpolation formula, divided difference, Newton's general interpolation formula

Curve Fitting, Cubic Spline and Approximation

Introduction, Method of Least Square Curve Fitting Procedures, Fitting a Straight Line, Approximation of functions.

Numerical Integration and Differentiation:

Introduction, Numerical differentiation, Numerical Integration, Trapezoidal Rule, Simpson 1/3 Rule, Simpson 3/8 Rule, Euler's Maclaurin formula, Predictor and Corrector formula

Statistical Computation:

Frequency Chart, Correlation, Regression Analysis, Least Square Fit, Polynomial Fit, Linear & Non Linear Regression, Multiple Regressions, Statistical Quality Control Methods, Multiple regression algorithms, time series and forecasting.

References:

- 1) Jain, Iyengar, Jain, "Numerical Methods for Scientific & Engineering Computation", New Age International.
- 2) Balaguruswamy, "Numerical Methods", TMH.
- 3) Sastry, "Introductory Method of Numerical Analysis", PHI

INFORMATION SECURITY

CSIT-418

2(2+0+0)

Unit 1 Introduction

Definition, history, need, basic principles, Introduction to Cyber environment, Cyber crimes, E-commerce, trusted and non-trusted systems, IPsec

Unit 2 Attacks, Threats and Vulnerabilities

Types of attacks, Malicious attacks types, Virus, Types of viruses, other Threats, countering virus threats, vulnerabilities, Malicious Tools, Scams, Identity theft, Frauds, Other security breaches.

Unit 3 Intrusion Detection and Prevention

Intrusion Detection Generic model, Types of intrusion detection systems, IDPS, NSM, Benefits and Limitations of current intrusion detection, Intrusion prevention system and their types

Unit 4 Computer and Digital Security

Introduction to Cyber security, goals and objectives, E-commerce security, Cryptography, Asset security, Network security, security issues in VPN, Database Security

Unit 5 Standards, Specifications and Protocols

Introduction to cyber laws, ISSA code of ethics, Intellectual property protection, Standards OSI, ISO17799, ISO/IEC 27002, DES, AES, Protocols, Specifications

Reference books:

- 1) Computer Security:- Dictergouman, John Wiley & Sons
- 2) Computer Security: Art and Science:- Mathew Bishop, Addison-Wesley
- 3) Cryptography and Network Security:- William Stallings, Pearson Education
- 4) Computer security:- Robert C. Newman, Jones and Barlett
- 5) Fundamentals of computer security:- Josef, Thomas and Jennifer, Springer

SEMESTER - V

PRINCIPLES OF COMPUTER NETWORKS

Code: CSIT 511

Credits: 5(3-1-2)

UNIT -I

Introduction: Basic concepts, Goals and Applications of Networks, Network structure and architecture, The OSI and TCP/IP reference models, Network Topology, Types of Networks, Network services.

UNIT -II

Physical layer: Theoretical basis for data communication, Transmission Media: Twisted pair, Coaxial, Optical Fiber. Wireless Transmission, Multiplexing: FDM, TDM, WDM. Switching: Circuit switching, Packet switching, Message Switching.

UNIT -III

Data link Layer: Data link Layer design Issues, Error detection and correction, Sliding Window protocols, Data Link Protocols (HDLC, PPP). MAC: Channel allocation problem, multiple access protocols, IEEE standard 802.X for LAN (Ethernet, Token Bus, Token Ring), high speed LANs, Wireless LANs

UNIT -IV

Network Layer: Network layer design issues, Routing algorithms, Internetworking, Network layer Protocols – IPv4, ICMP, ARP, and RARP. Internetworking devices: repeaters, Bridge, Router, Gateway. Introduction to IPv6.

UNIT -V

Transport Layer: Design issues, connection management, Transport layer protocols: UDP and TCP. Congestion Control algorithms (Leaky Bucket and Token Bucket).

Application Layer: Network Security, DNS, Protocols – FTP, HTTP, SMTP, and TELNET.

Text Books:

1. Forouzen, "Data Communication and Networking", TMH
2. A.S. Tanenbaum, "Computer Networks", 3rd Edition, Prentice Hall India, 1997.

Reference Books:

- 1.S. Keshav, "An Engineering Approach on Computer Networking", Addison Wesley
2. W. Stallings, "Data and Computer Communication", Macmillan Press, 1989.

DESIGN & ANALYSIS OF ALGORITHMS

Code : CSIT 512

Credit : 5(3-1-2)

Unit -I

Introduction: Introduction to Algorithms, Analysis of algorithms, Growth of Functions, Recurrences: Master's Theorem and Substitution Method. Analysis of sorting algorithms: Merge Sort, Heap Sort, and Quick Sort. Sorting in Linear time, Medians and Order Statistics.

Unit -II

Advanced Data Structure: Red-Black Trees, Augmenting Data Structures. B-Trees & Basic operations, Binomial Heaps: Creating new Binomial heaps, uniting Binomial Heaps, Merging two binomial heaps, Fibonacci Heaps & its basic operations, Data Structure for Disjoint Sets, Hash tables.

Unit -III

Advanced Design and Analysis Techniques: Dynamic programming: Matrix chain multiplication, longest common subsequence, Greedy Algorithms: Activity selection problem Knapsack problem, Backtracking, Branch and Bound, Amortized Analysis.

Unit -IV

Graph Algorithms: Elementary Graph Algorithms, Minimum Spanning Trees, Single-source Shortest Paths, All-Pairs Shortest Paths, Maximum Flow, Traveling Salesman Problem.

Unit -V

Selected Topics: Algorithms for Parallel Computers, String Matching, Randomized Algorithms, NP-Completeness, Approximation Algorithms.

Text Books :

Coreman, Rivest, Lisserson, : "Introduction to Algorithms", PHI.

References:

1. Basse, "Computer Algorithms: Introduction to Design & Analysis", Addison Wesley.
2. Horowitz & Sahani, "Fundamental of Computer Algorithm", Galgotia.

MICROPROCESSORS AND APPLICATIONS

Code: CSIT 513

Credits: 4(2-1-2)

Unit-I

Introduction: Microprocessor evolution and types, Microprocessor architecture and operations of its components, addressing modes, Interrupts, data transfer schemes, instruction and data flow, timer and timing diagram. Interfacing devices. Architectural advancement of microprocessor. Typical microprocessor development schemes.

Unit-II

16-bit Microprocessor: Introduction to 8085 microprocessor. Architecture of 8086 microprocessor: register organization, bus interface unit, execution unit, memory addressing, memory segmentation. Operating modes. Instruction sets, instruction format, Types of instructions. Interrupts: hardware and software interrupts.

Unit-III

Programming: Assembly language programming based on Intel 8086. Instructions, data transfer, arithmetic, logic, branch operations, looping, counting, indexing, programming techniques, counters and time delays, stacks and subroutines, conditional call and return instructions

Unit-IV

Peripheral Interfacing: Peripheral Devices: 8237 DMA Controller, 8255 programmable peripheral interface, 8253/8254 programmable timer/counter, 8259 programmable interrupt controller, 8251 USART and RS232C.

Unit - V

Micro controller (8051): Input/output pins, Port and circuits, External memory, counter, timers, interrupts and serial data Input/Output.

Text Books

1. Gaonkar , Ramesh S , “Microprocessor Architecture, Programming and Applications with 8085”, Penram International Publishing.

Reference Books

1. Ray A K , Bhurchandi K M , “Advanced Microprocessors and Peripherals”, TMH
2. Hall D V ,”Microprocessor Interfacing”, TMH
3. Liu and Gibson G A , “ Microcomputer System: The 8086/8088 family” ,PHI
4. Aditya P Mathur, “ Introduction to Microprocessor”, TMH
5. Brey, Barry B, “INTEL Microprocessors”, PHI

THEORY OF AUTOMATA AND FORMAL LANGUAGES

Code: CSIT 514

Credits: 4(3-1-0)

Unit – I

Introduction, Alphabets, Strings and Languages. Automata and Grammars: Deterministic Finite Automata (DFA), Language of DFA, Nondeterministic Finite Automata (NFA), Language of NFA, Equivalence of NFA and DFA, Minimization of Finite Automata.

Unit – II

Regular expression (RE), Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Non Regular Languages, Pumping Lemma for regular Languages. Application of Pumping Lemma, Closure properties of Regular Languages, FA with output: Moore and Mealy machine, Applications and Limitation of FA.

Unit – III

Context free grammar (CFG) and Context Free Languages (CFL): Definition, Examples, Derivation, Derivation trees, Ambiguity in Grammar, Inherent ambiguity, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure properties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs,

Unit – IV

Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA

Unit – V

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem.

Text Books

1. Hopcroft, Ullman, "Introduction to Automata Theory, Language and Computation", Nerosa Publishing House
2. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science(Automata, Languages and Computation)", PHI

Reference Books :

1. Martin J. C., "Introduction to Languages and Theory of Computations", TMH
2. Papadimitrou, C. and Lewis, C.L., "Elements of theory of Computations", PHI
3. Cohen D. I. A., "Introduction to Computer theory", John Wiley & Sons
4. Kumar Rajendra, "Theory of Automata (Languages and Computation)", PHI

1-Introduction:

Embedded systems and its applications, Embedded Operating system, Design parameters of an embedded system and its significance, design life cycle, tools introduction, hardware and software partitioning and co-design. 2. Hardware Fundamentals for the embedded developers Digital circuit parameters-Open collector outputs Tristate outputs I/O sinking and Sourcing, PLD's, Watchdog Timers, Hardware design and development. Custom Single Purpose Processors: Optimizing program, FSM, Data path & FSM. General purpose processors and ASIP's (Application Specific Instruction set Programming): Software and operation of general purpose processors-Programmers View Development Environment-ASIPs Microcontrollers-DSP Chips.

2- Introduction to Microcontrollers and Microprocessors :

Embedded versus external memory devices, CISC and RISC processors, Harvard and Von Neumann Architectures. 8051 Microcontrollers-Assembly language, architecture, registers, Addressing modes, Instruction set, I/O ports and memory organization Interrupts Timer/counter and serial communication. RTOS-Tasks, states, Data, Semaphores and shared data, Operating system services, Message queues, Mailboxes..

3-Advanced Processor:

(only architectures) 80386, 80486 and ARM (References).

4- Communication basics:

Microprocessor Interfacing I/O Addressing, Direct memory access, Arbitration, multilevel bus architecture, Serial protocols, Parallel protocols and wireless protocols.

5- Real world Interfacing:

LCD, Stepping Motor, ADC, DAC, LED, Push Buttons, Key board, Latch Interconnection, PPI.

Text Books:

1. Embedded System Design-Frank Vahid/Tony Givargis, John Willey@2005.
2. Microcontroller (Theory and Applications) Ajay V Deshmukh, Tata McGraw-Hill@2005.
3. An Embedded Software Primer-David E.Simon, Pearson Education @ 1999.

References:

1. The 8051 Microcontroller and embedded systems-Muhammad Ali Mazidi and Janice Gillispie.
2. Microcontrollers (Architecture, Implementation & Programming) Kenneth Hintz, Daniel Tabak, Tata McGraw-Hill@2005.
3. 8051 Microcontrollers & Embedded Systems 2nd Edition-Sampath Kr, Katson Books@2006.

SEMESTER – VI

PRINCIPLES OF SOFTWARE ENGINEERING

Code : CSIT 515

Credits : 4(3-1-0)

UNIT-I

Introduction: Introduction to software engineering, Importance of software, The evolving role of software, Software Characteristics, Software Components, Software applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Waterfall Model, Prototyping Model, The Incremental Model, Spiral Model

UNIT-II

Metrics for Process and Projects: Metrics for project size estimation, Project estimation techniques- Empirical, Heuristic and Analytical estimation technique, Halstead Software Science, COCOMO, Staffing level Estimation

Software Requirement Specification: Requirement gathering and Analysis, Software requirement Specification, Functional and Non-Functional Requirement

UNIT-III

Software-Design: Design principles, Design Concepts, Cohesion and Coupling. Function Oriented Design-Structured Analysis, Data Flow Diagrams, Structured Design, Transform and Transaction Analysis. Object Oriented Design- Concepts, Unified Modelling language, Use Case Model, Class Diagram, Activity Diagram. User Interface Design

UNIT-IV

Coding: Top-Down and Bottom –Up programming, structured programming, information hiding, programming style and internal documentation.

Testing: Testing principles, Levels of testing, functional testing, structural testing, test plane, test case specification, software testing strategies, Verification & validation, Unit testing, Integration Testing, Alpha & Beta testing, system testing and debugging.

UNIT-V

Software Reliability & Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Introductory concepts of Software quality Assurance.

CASE (Computer Aided Software Engineering): CASE and its Scope, CASE support in software life cycle, documentation, project management, internal interface, Reverse Software Engineering, Architecture of CASE environment.

Component Based Development

Formal methods

Text Book:

R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.

Reference Books:

1. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
3. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
4. Ian Sommerville, Software Engineering, Addison Wesley.
5. Pankaj Jalote, Software Engineering, Narosa Publication
6. Pfleeger, Software Engineering, Macmillan Publication.

COMPILER DESIGN

Code : CSIT 516

Credits : 5(3-1-2)

UNIT-I

Introduction to Compiling: Compilers, Analysis of the source program, the phases of the compiler, Cousins of the compiler.

Lexical Analysis: The role of the lexical analyzer, Tokens, Patterns, Lexemes, Input buffering, Specifications of a token, Recognition of a token, Finite automata, From a regular expression to NFA, From a regular expression to DFA, Design of a lexical analyzer generator (Lex).

UNIT-II

Syntax Analysis: The role of a parser, Context free grammars, Writing a grammar, Top down Parsing, Non-recursive Predictive parsing (LL), Bottom up parsing, Handles, Viable prefixes, Operator precedence parsing, LR parsers (SLR, LALR), Parser generators (YACC). Error Recovery strategies for different parsing techniques.

UNIT-III

Syntax directed translation: Syntax directed definitions, Construction of syntax trees, Bottom-up evaluation of S attributed definitions, L attributed definitions, Bottom-up evaluation of inherited attributes.

Type checking: Type systems, Specification of a simple type checker, Equivalence of type expressions, Type conversions

UNIT-IV

Symbol table: Basic concepts, Data structures for Symbol tables.

Intermediate code generation: Intermediate languages, Graphical representation, Three-address code, Implementation of three address statements (Quadruples, Triples, Indirect triples).

UNIT – V :

Code optimization: Introduction, Basic blocks & flow graphs, Transformation of basic blocks, Dag representation of basic blocks, The principle sources of optimization, Loops in flow graph, Peephole optimization.

Code generations: Issues in the design of code generator, a simple code generator, Register allocation & assignment.

Text books:

1. Aho, Sethi, Ullman - "Compiler Principles, Techniques and Tools" - Pearson Education.
2. Holub - "Compiler Design in C" - PHI.

COMPUTER ARCHITECTURE

Code : CSIT 517

Credits : 4(3-1-0)

UNIT -I

Introduction: Introduction to Parallel Computing, Need for Parallel Computing, Parallel Architectural classification schemes, Flynn's, Shores, Fengs classification, Performance of Parallel Processors. Amdahl Law Distributed Processing and Quantitative Approach.

UNIT-II

Memory: Processor & memory hierarchy, bus, cache & shared memory introduction to super scalar architectures, Quantitative evaluation of performance gains using memory, cache miss/hits.

UNIT-III

Pipeline Processing: Introduction to Pipeline Processing, SIMD parallel processors, Arithmetic pipelines, steady state analysis of pipeline, Pipelined instruction processing, interlocks, hazards, hazards detentions and resolution memory systems used in pipelines, scheduling of dynamic pipelines.

UNIT-IV

Synchronous Parallel Processing: SIMD Parallel algorithm, recurrence and matrix computations, Distributed array processor, Processor Arrays, Multiprocessors, parallel programming languages, mapping and scheduling.

UNIT-V

Interconnection Networks: Introductions, Elementary Permutations used in Interconnection Network, Network Classification - Cross bar network, Commonly used Interconnection Network, Data Manipulator, Network Routing, and Multistage Data Manipulator.

Text Book :

1. Hwang, "Advanced Computer Architecture", McGraw Hill.

Books & References:

1. Peterson & Heresy, "Quantitative approach to computer Architecture," "Morgan Kaufman".
2. Quin, "Parallel Computing, Theory and Practices," McGraw Hill.
3. Bhujde, "Parallel Computing," New Age International.
4. Englander, "Architecture of Computer Hardware & Software System," Jon Willey & Sons.

COMPUTER GRAPHICS

Code: CSIT – 518

Credits: 5(3-1-2)

UNIT-I

Introduction: Basic concepts , Applications, Interactive devices, Graphics hardware.

Output Primitives: Attributes of Output Primitives. Points & lines, Line drawing algorithms: DDA algorithm, Bresenham's line algorithm, Circle generation algorithm, Ellipse generating algorithm.

UNIT –II

Polygon: Polygon Representation, Entering polygons. Fill algorithms: boundary fill algorithm, flood fill algorithm.
Segments: Segments table, creating deleting and renaming segments, visibility.

UNIT-III

2D transformation & viewing: Basic transformations: translation, rotation, scaling; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation, clipping operations , point clipping , line clipping, clipping circles , polygons & ellipse.

UNIT-IV

3D transformation & viewing: 3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, viewport clipping, 3D viewing.

UNIT-V

Curves : Curve representation, surfaces, designs, Bezier curves , B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves.

Hidden surfaces: Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods, fractal - geometry.

Text Books:

1. Hearn, Baker – “ Computer Graphics (C version 2nd Ed.)” – Pearson education

Reference Books:

1. Foley, Vandam, Feiner, Hughes “Computer Graphics principles (2nd Ed.) – Pearson Education.
2. W. M. Newman, R. F. Sproull – “Principles of Interactive computer Graphics” – TMH.
3. Z. Xiang, R. Plastock – “ Schaum's outlines Computer Graphics (2nd Ed.)” – TMH
4. D. F. Rogers, J. A. Adams – “Mathematical Elements for Computer Graphics (2nd Ed.)” TMH
5. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI
6. Mukherjee Arup, Introduction to Computer Graphics, Vikas

JAVA PROGRAMMING

Code: CSIT 605

Credits: 5(3-1-2)

UNIT-I

Java Programming: Introduction, Characteristics of Java, Object Oriented Programming, classes and object, Inheritance and polymorphism, abstract and final classes, Interface, Exception Handling.

UNIT-II

Multithreaded Programming – Basic concepts, Creating threads, Life cycle of a Thread, Thread Methods, Synchronization of Threads, Inter-Thread communication.

AWT Programming: Basics of AWT, Applet fundamentals, Life cycle of an applet, Fundamentals of event handling, Event handling models.

UNIT -III

Java Database Connectivity – Overview of JDBC, JDBC drivers, JDBC implementation- DriverManager class, Connection interface, Statement interface, ResultSet interface, Prepared & Callable statement interface, ResultSetMetaData interface. Transaction Management- commit and rollback.

I/O in java - I/O basics, stream classes . **Introduction to Network programming.**

UNIT IV

Servlet: Introduction to Servlet, Servlet life cycle, Servlet API, GenericServlet and HttpServlet, Understanding web.xml, GET and POST method, Retrieving parameters from request, sending a response Request Dispatcher, Session tracking – Cookies.

JSP : Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

UNIT –V

Java Beans: Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB, Java Beans API.

Latest Technologies/ concepts : MVC Architecture. Struts framework, Introduction to RMI and EJB, Spring framework, JSF framework, AJAX & Web services

Text Books :

Herbert Schildt, “The Complete Reference:Java”, TMH.

REFERENCE:

1. Burdman, “Collaborative Web Development” Addison Wesley.
2. Chris Bates, “WebProgrammingBuilding Internet Applications”, 2nd Edition, WILEY, Dreamtech
3. Joel Sklar, “Principal of web Design” Vikash and Thomas Learning
4. Horstmann, “CoreJava”, Addison Wesley.
5. Hans Bergsten, “Java Server Pages”, SPD O’Reilly

ORGANIZATIONAL BEHAVIOR

Code: BAM 317

Credits : 3(3-0-0)

- Nature of Organizational Behavior
- Theories of Organizational Behavior
- Organizational setting
- Group dynamics & organizational behavior
- Conflict Resolution & Intergroup Behavior
- Communication & Group Decision Making
- Leadership
- Management of Change
- Organizational Development Process
- Team Building
- Organizational Climate & Culture
- Motivation
- Industrial Behavior : Ability, Personality, Attitude, Attitude Learning, Perception.

Text Books:

1. Organization Behavior - S.P. Robbins
2. Organization Behavior - Luthans

References Books:

1. Jit S Chandan "Organizational Behavior", Vikas
2. M.N. Mishra : "Organization Behavior", Vikas
3. Arnold, John, Robertson, Ivan I. and Cooper, Cary, I., " Work Psychology: understanding human behavior in the workplace", Macmillan India Ltd., Delhi. 1996.
4. Dwivedi, R.S., Human relations and organizational behavior: a global perspective, Macmillan India Ltd., Delhi, .1995.

Semester – VII

SOFTWARE PROJECT MANAGEMENT

Code : CSIT-603

Credits : 4(3-1-0)

UNIT-I: Introduction and Software Project Planning

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

UNIT-II: Project Organization and Scheduling

Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

UNIT-III: Project Monitoring and Control

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

UNIT-IV: Software Quality Assurance and Testing

Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model (CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance.

UNIT-V: Project Management and Project Management Tools

Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

Text Books :

Bob Hughes & Mike Cotterell, “Software Project Management”, TMH

Reference Books:

Walker Royce,” Software Project Management”, Pearson

Manish Kumar Jha, “ Software Project Management”, Dhanpat Rai & Co.

Rajiv Chopra, “ Software Project Management”, Katson Books

SYSTEM PROGRAMMING

Code : CSIT 604

Credits : 5(3-1-2)

UNIT-I :

Introduction: Machine Structure, Evolution of the components of a programming system: Assemblers, Loaders, Macros, Compilers, and Formal Systems. Operating System, computer languages: Machine language, assembly language.

UNIT-II

Assemblers: Elements of assembly language programming, Structure of assemblers, design of two-pass assembler and single pass assembler.

Macros and Macro Processors: Macro definition and call, Macro Expansion, Nested Macro calls, advanced macro facilities, Design of Macro -Processors.

UNIT-III

Linkers & Loaders: Relocation and Linking concepts, Design of linker, self-relocating programs, design of sample linker, Linking for overlays, Loaders: Loader Schemes, Design of absolute loader, design of direct linking loader.

UNIT- IV

Introduction: Basic Unix programming concepts and terminologies, System Calls and Library Functions
I/O - Unbuffered I/O, properties of files and directories, standard I/O library, standard system data files, Terminal I/O and daemon process.

UNIT-V

Process: Fundamentals, Process Identifiers, Functions: fork, vfork, exit, wait, exec. Race Conditions, Process relationships,
Signals: Concepts, unreliable signals, Interrupted system calls, Re-entrant Functions, Different signal handling functions.
IPC - Pipes, Coprocessors, FIFOs, Semaphores, Shared Memory.

Text Books :

1. "John J. Donovan", system programming , TMH
2. W. Richard Stevens and Stephen A. Rago, *Advanced Programming in the UNIX Environment*, Second Edition, Addison Wesley, 2005

Text Books :

1. "D M Dhamdhare", Systems Programming and Operating Systems, TMH
2. "Robert Love ", Linux system programming, O'Reilly
3. "D. S. W. Tansl", Linux and UNIX shell programming, Addison-Wesley

. NET TECHNOLOGY

Code : CSIT 606

Credits : 4(2-1-2)

UNIT-I

The .NET framework: Introduction, Common Language Runtime, Common Type System, Common Language Specification, The Base Class Library, The .NET class library Intermediate language, Just-in-Time compilation, garbage collection, Application installation & Assemblies, Web Services, Unified classes.

UNIT-II

C# Basics: Introduction, Data Types, Identifiers, variables & constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System Collections, Delegates and Events, Indexes Attributes, versioning.

UNIT-III

C# Using Libraries: Namespace-System, Input/Output, Multi-Threading, Networking and Sockets, Data Handling, Windows Forms, C# in Web application, Error Handling.

UNIT-IV

Advanced Features Using C#: Web Services, Windows services, messaging, Reflection, COM and C#, Localization.

UNIT-V

Advanced Features Using C#: Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, Case Study (Messenger Application)

Text Books

1. Shibi Panikkar and Kumar Sanjeev, "C# with .NET Frame Work", Firewall Media.
2. Shildt, "C#: The Complete Reference", TMH

Reference Books

1. Jeffrey Richter, "Applied Microsoft .Net Framework Programming", (Microsoft)
2. Fergal Grimes, "Microsoft .Net for Programmers", (SPD)
3. Tony Baer, Jan D. Narkiewicz, Kent Tegels, Chandu Thota, Neil Whitlow, "Understanding the .Net Framework", (SPD)
4. Balagurusamy, "Programming with C#", TMH

PRINCIPLES OF OPERATIONS RESEARCH

Code: MAS-651

Credits: 4(3-1-0)

Unit-I

Linear programming problems: Linear Programming Problems (LPP)- Formulation of a LPP graphical method-Simplex Method - Revised Simplex Method - two Phase Method - Dual Simplex Method.

Unit-II

Transportation Problems: Least cost Method, Vogel's Approximation Method, MODI (Modified Distribution) Method. Introduction to Integer Linear Programming.

Assignment Problems: Hungarian Method, Sequencing, Routing Problem.

Unit-III

CPM and PERT: CPM and PERT- Network Diagram - Events and Activities - Project Planning reducing Critical Events and Activities - Critical Path calculations – Examples - Resources and man power leveling. Sequencing Problems - Traveling Salesman Problems– Machine-Scheduling Problem (Job-shop).

Unit-IV

Replacement problems and Inventory models: Replacement Problems - Capital Equipment- Discounting costs - Replacement in anticipation of failure - Group replacement – stochastic nature underlying the failure phenomenon. Inventory models - various costs - Deterministic Inventory Models - Economic lot sizes – Price breaks –Finite storage.

Unit-V

Game Theory: Matrix (or rectangular) games, MinMax and MaxMin Theorem, Saddle point, game without saddle point, Fundamental theorem of game theory, Dominance principle.

Text Book :

H.A. TAHA, "Operation research- An Introduction", Macmillan1976.

References Books

1. Hillier and Lieberman: "Introduction to operation research", (1990) Mc Graw Hill, Company.
2. Ecker and Kuperfesch mid: "Introduction to Operation research" (1988), John Wiley
3. Swapnil Srivastava, "A fundamental Approach to operations Research "
4. B.E. Gillet, "introduction to Operation Research", TMH

ARTIFICIAL INTELLIGENCE

Code: CSIT 608

Credits: 4(2-1-2)

UNIT I: Introduction

Definition of AI, Foundations of AI, Importance of AI, AI Technique, Criteria for Success: Turing test, Definition and Importance of Knowledge, Knowledge based system. Introduction to AI programming Languages: LISP, PROLOG.

UNIT II: Knowledge Representation and Acquisition

Propositional Logic, Predicate Logic, Clausal form, Inference Rules, Resolution, Representing Knowledge using Rules, Dealing with Uncertainty, Fuzzy Logic, Structured Knowledge Representation: Associative Networks, Frames, Conceptual Dependency, Scripts. Knowledge Acquisition: Definition, Learning: Definition, types of learning

UNIT III: Search and Control Strategies

Introduction, Preliminary Concepts, Example of search problems, Uninformed Search: BFS, DFS. Informed Search: Heuristic Information, Hill Climbing Methods, Best-First Search, Branch and bound Search, Hill climbing, optimal search and A*. Properties of search Algorithms.

UNIT-IV: Expert Systems

Introduction, Importance and application of expert system, Rule based system architecture: Examples, Components of a typical expert system. Non-Production System Architecture: Associative or semantic Networks, Decision Tree, Blackboard, Neural Network Architecture.

UNIT V: Advance topics

Introduction to Game Playing, Planning, Natural Language Understanding, Pattern Recognition, Robotics.

Text Book:

1. Artificial Intelligence: - Elaine Rich and Knight

Reference Books:

1. Artificial Intelligence and Expert System: - Patterson
2. Artificial Intelligence, A Modern Approach: - Russell Norvig
3. Lisp: - Patrick Winston, Horn

Semester – VIII

ELECTIVE – I

XML APPLICATIONS

CSIT 641

Credits: 4(3-1-0)

UNIT-I

Introduction: History and growth of the Web, Protocols governing the web, Introduction to Cyber Laws in India, Introduction to International Cyber laws, Web project, Web Team, Team dynamics.

Communication Issues, The Client, Multi-departmental and Large scale Websites, Quality Assurance and testing, Technological advances and Impact on Web Teams.

UNIT-II

Scripting Languages:

HTML: Formatting Tags, Links, List, Tables, Frames, forms, Comments in HTML, DHTML.

JavaScript: Introduction, Documents, forms, Statements, functions, objects in JavaScript, Events and Event Handling, Arrays, FORMS, Buttons, Checkboxes, Text fields and Text areas.

UNIT-III

Server Side Programming: Common Gateway Interface (CGI), PERL, COM/DCOM, VBScript, Active Server Pages (ASP).

XML: Introduction, Displaying an XML Document, Data Interchange with an XML document, XML, Client-side usage, Server Side usage.

UNIT IV

XMLtools and standards: XML Schema, DTD, CSS and XSLT, XML parsers, Schema validators and XSLT processors like Visual Studio, XSLT transformations and programming,XHTML, and DOM interface.

UNIT V

XML Applications: Electronic commerce, Web Services, multichannel publishing and XSL-FO, RSS and semantic Web.

Text Books

1. Burdman, “Collaborative Web Development”, Addison Wesley.
2. Sharma &Sharma, “Developing E-Commerce Sites”, Addison Wesley
3. Ivan Bayross, “Web Technologies Part II”, BPB Publications.

References Books:

1. ShishirGundavarma, “CGI Programming on the World Wide Web”, O’Reilly & Associate.
2. DON Box, “Essential COM”, Addison Wesley.
3. Greg Buczek, “ASP Developer’s Guide”, TMH.

SYSTEM SIMULATION & MODELING

Code: CSIT 642

Credits: 4(2-1-2)

Unit- I Introduction

Systems, System Environment, System Modeling, Principles of Modeling. Simulation : Concept, Need, Types and Applications. Advantages, Disadvantages and Pitfalls of Simulation.

Unit- II Design of Simulation Experiments

Problem formulation, Data collection and Reduction, Key variables, Length of Simulation runs, Starting Condition, Experimental layout, Interpreting Validation.

Unit- III Probability Distribution

Normal, Gaussian and Poisson Distribution. Monte-Carlo method, Computation Technique for Continuous Model, Computation Technique for Discrete Model, Methods of generating Random numbers, Testing Random numbers.

Unit- IV Simulation Languages

Types of Simulation Languages, Factors in selecting Simulation Languages, Simulation Software Classification, Desirable Software Features, Introduction to Simulation Languages: SIMULA, GPSS

Unit- V

Study of simulation models: queuing system, Inventory Control and forecasting, PERT network.

Text Books:

1. Geoffrey Gordon, "System Simulation", 2nd Edition, PHI
2. Averill M. Law, "Simulation Modeling and Analysis", 4th Edition, TMH

Reference Books:

1. Narsingh Deo, "System Simulation with Digital Computer", PHI

IMAGE PROCESSING

Code: CSIT 643

Credits: 4(3-1-0)

UNIT-I

Introduction and Fundamentals : Motivation and Perspective , Applications, Components of Image Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization.

Image Enhancement in Spatial Domain : Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image Subtraction, Image Averaging; Basics of Spatial Filtering; Smoothing - Mean filter, Ordered Statistic Filter; Sharpening – The Laplacian.

UNIT-II

Image Enhancement in Frequency Domain : Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain, Filters – Low-pass, High-pass; Correspondence Between Filtering in Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Lowpass Filters; Sharpening Frequency Domain Filters – Gaussian Highpass Filters; Homomorphic Filtering.

Image Restoration : A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters – Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering – Bandpass Filters; Minimum Mean-square Error Restoration.

UNIT-III

Color Image Processing : Color Fundamentals, Color Models, Converting Colors to different models, Color Transformation, Smoothing and Sharpening, Color Segmentation.

Morphological Image Processing : Introduction, Logic Operations involving Binary Images, Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening

UNIT-IV

Registration : Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging – Algorithms to Establish Correspondence, Algorithms to Recover Depth

Segmentation : Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge Operators, Pattern Fitting Approach, Edge Linking and Edge Following, Edge Elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection.

UNIT-V

Feature Extraction : Representation, Topological Attributes, Geometric Attributes

Description : Boundary-based Description, Region-based Description, Relationship.

Object Recognition : Deterministic Methods, Clustering, Statistical Classification, Syntactic Recognition, Tree Search, Graph Matching

Text Books:

1. Digital Image Processing 2nd Edition, Rafael C. Gonzalvez and Richard E. Woods. Published by: Pearson Education.
2. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY.
3. Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall, Upper Saddle River, NJ.

GENETIC ALGORITHMS

CSIT644

4(3-1-0)

UNIT-I

Introduction to genetic algorithms. A simple genetic algorithm. A simulation by hands, similarity templates (Schemata). Mathematical foundations. Schema Processing at work.

UNIT-II

The two- armed and k-armed Bandit Problem. The building block hypothesis. The minimal Deceptive Problem.

UNIT-III

Computer implementation of Genetic algorithm. Data Structures, Reproduction , Cross over and Mutation.

UNIT-IV

Time to reproduce and time to Cross Mapping objective function to fitness form. Fitness scaling. Applications of genetic algorithms. De Jong and Function Optimization, Improvement in basic techniques.

UNIT-V

Introduction to Genetics based machine learning. Applications of genetic based machine learning.

Text book

1. Introduction to Artificial Intelligence By Eugene Charniak, Drew McDermott- Addison Wesley
2. Neural Networks and fuzzy systems A dynamical systems approach to machine Intelligence by Bart Kosko- PHI
3. Genetic Algorithms in search, Optimization & Machine Learning by David E Goldberg- Addison wesley
4. Data Mining by Pieter Adriaans and Dolf Zantinge . Pearson Education Asia
5. Data Warehousing in the Real World by Sam Anahory and Dennis Murray, Addison - Wesley

References:

1. Yegnanarayana B., .Artificial Neural Networks., PHI
2. Driankov D., Hellendoorn H. & Reinfrank M., .An Introduction to Fuzzy Control., Norosa Publishing House
3. Berkan R.C., and Trubatch S.L., .Fuzzy Systems Design Principles., IEEE Press

OBJECT ORIENTED MODELING

Code : CSIT-645

Credits : 4(3-1-0)

UNIT-I : Introduction

Introduction to Object oriented developments and object oriented themes. Object Modeling, Dynamic Modeling and Functional Modeling, Methodology Preview: OMT Methodology, Merits and Impacts of Object Oriented Approaches.

UNIT-II : Analysis

Overview of Analysis, Problem Statement, Automated teller Machine Example, Object Modeling, Dynamic Modeling and Functional Modeling, Adding Operations, Iterating the Analysis

UNIT-III : System Design

Overview of System Design, Breaking system into subsystems, Identifying Concurrency, Allocating Subsystems to Processors and Tasks, management of Data Store, handling Global Resources, Choosing Software Control Implementation, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Frameworks

UNIT-IV :

Object Design: Overview of Object Design, Combining the Three Models, Designing Algorithms, Design Optimization, Implementation of Control, Adjustment of Inheritance, Design of Association, Object Representation, physical Packing, Documenting Design Decisions,

Implementation: Implementation using a programming Language and Database System

UNIT-V

Unified Modeling Language, Basic structures and modeling classes, common modeling Techniques, relationships, common mechanism, class diagrams, Advanced structured modeling, advanced classes and relationships, interfaces, types and roles, instances and object diagram. Basic idea of behavioral modeling.

Text Book :

By James Rumbaugh, "Object oriented Modeling and Design", Pearson

REFERENCE BOOK:

1. Benjamin & Cummins, "Object Oriented Modeling And Design", Redwood City C.A.U.S.A.
2. Rebecca Wirfs, "Designing Object Oriented Softwares", PHI
3. Tom Pender, "UML Bible"
4. Michael Blaha, Rumbaugh, "Object- oriented Modeling and Design with UML", PHI

ELECTIVE – II

DISTRIBUTED SYSTEMS

Code: CSIT –651

Credits: 4(3-1-0)

UNIT I

Introduction, Goals - Hardware Concepts - bus based multiprocessor - switched multiprocessor - bus based Multicomputer – switched Multicomputer - Software Concepts- Network Operating Systems, Multiprocessor time-sharing system – Design issues. Communication-Layered Protocols - ATM networks.

UNIT II

Basic concepts of Client Server Model, Remote Procedure Call- Basic Operation, RPC protocol architecture. Group Communications, Group Communication Services. Streams and Quality of Services, Synchronization: Clock Synchronization – Mutual Exclusion Algorithms.

UNIT III

Threads, Process - System models, Multithreaded Server Organization. Virtualization in Distributed System. Processor Allocation scheduling in Distributed Systems. - Fault Tolerance - Real time distributed systems.

UNIT IV

Distributed file system, Trends in Distributed File Systems, Distributed shared memory - consistency models – page based distributed shared memory - shared variable distributed shared memory.

UNIT V

Case studies: Amoeba : Introduction – Objects and capabilities in Amoeba – Process and Memory Management in Amoeba – Communication in Amoeba – The Amoeba Services..

Text Book :

1 Andrew S.Tanenbaum, “*Distributed Operating Systems*”, Pearson Education Asia, 2001.

Reference Books

1. Mukesh Singhal and Niranjana G.Shivaratri, “*Advanced concepts in Operating system*”, TMH.
2. Pradeep.K. Sinha, “*Distributed operating systems*, PHI, Newdelhi, 2001.

COMPUTING AND COMPLEXITY THEORY

CSIT – 652

Credits : 4(3-1-0)

UNIT –I

Computational Models (Logic Circuits, Finite-State Machines, Random-Access Machine, Other Models), Formal Languages, Introduction to Computational Complexity.

UNIT –II

Complexity Classes(NP, NP and PSAPCE), Reductions, hardness, completeness, hierarchy, relationships between complexity classes.

UNIT-III

Space Complexity, Hierarchies, Circuit satisfiability, Savitch and Immerman theorems, Karp Lipton Theorem.

UNIT- IV

Randomized Complexity classes, Adleman's theorem, Sipser Gacs theorem, Randomized Reductions, Counting Complexity, Permanent's and Valiant's Theorem

UNIT-V

Parallel complexity, P-completeness, Sup-liner space classes, Renegold's theorem, Polynomial hierarchy and Toda's theorem.

Text Books:

1. S. Arora, B. Barak, Computational Complexity: A Modern Approach, Cambridge University Press
2. Papadimtriou C. H., Computational Complexity, Addison Wesley

Reference Books:

1. Motwani R, Randomized Algorithms, Cambridge University Press
2. Vazirani V., Approximation Algorithms, Springer

PARALLEL ALGORITHMS

CSIT 653

Credits: 4(3-1-0)

Unit-I:

Sequential model, need of alternative model, parallel computational models such as PRAM, LMCC, Hypercube, Cube Connected Cycle, Butterfly, Perfect Shuffle Computers, Tree model, Pyramid model, Fully Connected model, PRAM-CREW, EREW models, simulation of one model from another one.

Unit-II:

Performance Measures of Parallel Algorithms, speed-up and efficiency of PA, Cost- optimality, An example to illustrate Cost-optimal algorithms- such as summation, Min/Max on various models.

Unit-III:

Parallel Sorting Networks, Parallel Merging Algorithms on CREW/EREW/MCC/, Parallel Sorting Networks on CREW/EREW/MCC/, linear array

Unit-IV:

Parallel Searching Algorithm, Kth element, Kth element in X+Y on PRAM, Parallel Matrix Transportation and Multiplication Algorithm on PRAM, MCC, Vector-Matrix Multiplication, Solution of Linear Equation, Root finding.

Unit-V:

Graph Algorithms - Connected Graphs, search and traversal, Combinatorial Algorithms- Permutation, Combinations, De-arrangements.

Text Book:

1.M.J. Quinn, "Designing Efficient Algorithms for Parallel Computer" by Mc Graw Hill.

Reference Books:

1. S.G. Akl, "Design and Analysis of Parallel Algorithms"
2. S.G. Akl, "Parallel Sorting Algorithm" by Academic Press

NETWORK SURVIVABILITY

CSIT – 654

Credits: 4(3-1-0)

- **Unit 1:** Issues of Survivability, Attributes of System Survivability, Trustworthiness, Dependability and Assurance.
- **Unit 2:** Threats to Survivability, Threats to Security, Threats to Reliability, Threats to Performance.
- **Unit 3:** Measures of survivability, survivability requirements in networks, Systemic Inadequacies, network survivability architectures, diverse routing algorithms, design problems in network survivability.
- **Unit 4:** Implementing and Configuring for Survivability.
- **Unit 5:** Survivability in existing networks

Text Books:

1. R. K. Ahuja, T. L. Magnanti, J. B. Orlin, Network Flows. Prentice-Hall, 1993
2. R. Bhandari, Survivable Networks: Algorithms for Diverse Routing, Kluwer Academic Publishers, 1999

Reference Books

1. W. D. Grover, Mesh-Based Survivable Transport Networks: Options and Strategies for Optical, MPLS, SONET and ATM networking, Prentice Hall, 2003
2. M. Pioro, D. Medhi, Routing, Flow, and Capacity Design in Communication and Computer Networks. Morgan Kauffmann, 2004
3. K. Trivedi, Probability and Statistics with Reliability, Queueing and Computer Science Applications. Wiley Interscience, 2002

CRYPTOGRAPHY AND NETWORK SECURITY

Code : CSIT-655

Credits : 4(3-1-0)

Unit-I

Overview : Introduction to security attacks, services and mechanism, introduction to cryptography. Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and transposition ciphers, cryptanalysis, stereography, stream and block ciphers.

Modern Block Ciphers: Block ciphers principals, Shannon's theory of confusion and diffusion, fiestal structure, data encryption standard (DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, traffic confidentiality, key distribution, random number generation.

Unit-II

Number Theory: Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat's and Euler's theorem, primality testing, Euclid's Algorithm, Chinese Remainder theorem, discrete logarithms.

Public Key Cryptography: Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffie-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption.

Unit-III

Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA).

Digital Signatures: Digital Signatures, authentication protocols, digital signature standards (DSS), proof of digital signature algorithm.

Unit-IV

Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.

Unit-V

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management.

Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET).

System Security: Intruders, Viruses and related threads, firewall design principles, trusted systems.

Text Book:

William Stallings, "Cryptography and Network Security: Principals and Practice", PHII

Books:

1. Johannes A. Buchmann, "Introduction to Cryptography", Springer-Verlag.
2. Bruce Schiener, "Applied Cryptography".

ELECTIVE - III

MOBILE COMMUNICATION

Code: CSIT 661

Credits: 4(3-1-0)

Unit – I Introduction:

Mobile computing, Issues in mobile computing, overview of wireless telephony: Cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

Unit – II Wireless Networks

Basic concepts, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless networks, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

Unit – III : Data Management

Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, disconnected operations.

Unit – IV: Mobile Agents

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

Unit – V Ad Hoc Networks

Basic Concepts, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

Text Books:

1. J. Schiller, Mobile Communications, Addison Wesley.
2. A. Mehrotra, GSM System Engineering.

Reference Books:

1. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
2. Charles Perkins, Mobile IP, Addison Wesley.
3. Charles Perkins, Ad hoc Networks, Addison Wesley

REAL TIME SYSTEMS

Code: CSIT- 662

Credits: 4(3-1-0)

UNIT-I: Introduction

Concept of Real Time System, Issues in Real Time computing, Typical real time applications. Basic terminologies: Release Times, Deadlines and Timing constraints, hard real time systems and soft real time systems. Model of Real Time System: Processor, resources, temporal parameter, Periodic Task Model, Sporadic Task Model, Precedence Constraints and Data Dependencies.

UNIT-II: Approaches to Real Time Scheduling

Clock driven approach, weighted, round robin approach, priority driven approach, dynamic versus static systems, optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) algorithms, rate monotonic algorithm, offline versus online scheduling, scheduling Aperiodic and Sporadic jobs in priority driven and clock driven systems.

UNIT-III: Resources and Resource Access Control

Assumptions on resources and their usage, resource contention, resource access control (Priority Ceiling Protocol, Priority Inheritance protocol, Slack Based Priority Ceiling Protocol, Preemption Ceiling Protocol).

UNIT-IV: Real Time Communication

Basic concepts in real time communication, soft and hard real time communication systems, Model of real time communication, priority-based service and weighted round-robin service disciplines for switched networks, medium access control protocols for broadcast networks, Internet and resource reservation protocols.

UNIT-V: Real Time Operating Systems

Features of an RTOS, time services, characteristic of temporal data, temporal consistency, concurrency control.

Text books:

1. Real Time Systems by Jane W. S. Liu, Pearson Education Publication.

Reference books:

1. Real-Time Systems: Scheduling, Analysis, and Verification by Albert M. K. Cheng Wiley.
2. Real Time Systems by Mall Rajib, Pearson Education Publication.

OBJECT ORIENTED DATABASE MANAGEMENT SYSTEMS

Code: CSIT – 663

Credits: 4(3-1-0)

UNIT - I

Object oriented Data Model.

OO Relationships, Relationship integrity, ER Diagramming models for OO Relationships - different notations (Coad/Yurdan notation, Shlaer/Meeloor notation, OMT notation, UML notation and Booch Notation), Integrating Objects into a Relational Database.

UNIT – II

Object orientation in Query Languages.

Introduction to Object Definition Language (ODL) – Class declarations, attributes in ODL, Relationships in ODL, Inverse relationships, Multiplicity of relationships, methods and types in ODL.

Additional ODL concepts: Multi-way relationships in ODL, sub- classes in ODL, multiple Inheritance in ODL, extents, declaring keys in ODL. From ODL to Relational Designs , Object relational model – from relations to object relations, Nested relations, references, OO vs object relational, from ODL design to OR designs.

Introduction to OQL – features of OQL, additional forms of OQL expressions, object Assignment and creation in OQL, user defined types in SQL, operations on objet-relational data, Ordering relationships on UDTs

UNIT – III

Object Oriented Database Systems (including Object Relational Database Systems).

Relational vs Object Oriented Database Systems: Semantic Database Systems, Object Hierarchies - Generalization, Specialization, Aggregation, E-R model, RM/T, SDM, SAM, Daplex, IFO.

The architecture of Object Oriented Databases, Query Languages for OO Databases, Gemstone/O2/Orion/Object stone, Object Relational Database Management System (ORDBMS) - Oracle 8i, 9i, DB2.

Overview of object database systems: ORDBMS implementation and challenges, database design for an ORDBMS, OODBMS – ODMG data model and ODL, comparison of RDBMS, OODBMS and ORDBMS.

UNIT – IV

Information Integration.

Semi- structured data: Motivation for the semi-structured data model, semi-structured data representation, Information integration Vs semi-structured data.

XML and its data model: semantic tags, well formed XML, document type definitions, using a DTD, attribute lists.

Modes of Information integration, wrappers in mediator based systems, capability based optimization in Mediators, Online analytical processing, data cubes, and materialized views.

UNIT – V

Object Database standards.

Basics of OODBMS terminology, understanding of types, inheritance, representing logical Relationships, basic interface and class structure, declaring attributes, specifying relationships, Adding operator signatures and the complete schema.

Text Books.

1. Jan L Harrington : “Object oriented Database Design clearly explained” , Morgan Kaufman publishers, API
2. Ramakrishnan and Gehrke: “Database Management Systems” International edition, Mc-graw Hill, 2003.
3. H Garcia –Molina , J D Ullman and J Widom: “Database Systems The complete book” , Pearson Education.

Reference Books.

1. R. Cattell, “Object Data management”, (1993), Addison-Wesely.
2. CSR Prabhu, “Object Oriented Databases Systems : Approaches and Architectures” (1999),Prentice Hall of India.

SOFT COMPUTING

Code: CSIT 664

Credit: 4 (3-1-0)

Unit-I : Neural Networks-1(Introduction & Architecture)

Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Various learning techniques; perception and convergence rule, Auto-associative and hetero-associative memory.

Unit-II: Neural Networks-II (Back propagation networks)

Architecture: perceptron model, solution, single layer artificial neural network, multilayer perceptron model; back propagation learning methods, effect of learning rule coefficient; back propagation algorithm, factors affecting backpropagation training, applications.

Unit-III: Fuzzy Logic-I (Introduction)

Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion.

Unit-IV: Fuzzy Logic –II (Fuzzy Membership, Rules)

Membership functions, inference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzifications & Defuzzifications, Fuzzy Controller, Industrial applications.

Unit-V: Genetic Algorithm (GA)

Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations,(encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.

Text Books:

- 1.S. Rajsekaran & G.A. Vijayalakshmi Pai, "Neural Networks,Fuzzy Logic and Genetic Algorithm:Synthesis and Applications" Prentice Hall of India.
- 2.N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.

Reference Books:

- 3.Siman Haykin,"Neural Networks"Prentice Hall of India
- 4.Timothy J. Ross, "Fuzzy Logic with Engineering Applications" Wiley India.
- 5.Kumar Satish, "Neural Networks" Tata Mc Graw Hill

CLOUD COMPUTING

Code: CSIT – 665

Credits: 4(3-1-0)

Unit I

Cloud Computing Fundamentals: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications.

Unit II

Cloud Applications: Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages

Unit III

Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics. Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google, Salesforce.com, Ubuntu and Redhat)

Unit IV

Application Development: Service creation environments to develop cloud based applications. Development environments for service development; Amazon, Azure, Google App.

Unit V

Best Practice Cloud IT Model : Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO).

Text Book:

1. Gautam Shroff, Enterprise Cloud Computing Technology Architecture Applications

References Books:

1. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical Approach"
2. Dimitris N. Chorafas, "Cloud Computing Strategies"