

B. Tech. Electronics & Communication Engineering

SEMESTER I

S.No.	Subject Code	Subject	L-T-P	Credit
1	LNG-302	Professional Communication	2-1-0	3
2	CHEM-513	Chemistry	3-1-1	5
3	MAS-411	Engineering Mathematics-I	3-1-0	4
4	ECE-301	Basic Electronics	2-1-1	4
5	CE-401	Engineering Mechanics	2-1-0	3
6	ME-301	Engineering Graphics-I	0-0-2	2
7	GPT-301	Moral And Value Education	2-0-0	2
8	ME-302	Introduction to Manufacturing Process	2-0-0	2
			Total Credits	25

SEMESTER II

S.No.	Subject Code	Subject	L-T-P	Credit
1	LNG-303	Professional Communication -II	2-1-0	3
2	PHY-312	Engineering Physics	3-1-1	5
3	MAS-490	Engineering Mathematics-II	3-1-0	4
4	COMP-410	Computer And Languages	2-0-1	3
5	ME-304	Workshop Practice & Technology	2-0-2	4
6	ME-401	Engineering Graphics-II	0-0-2	2
7	EEE-303	Electrical Engineering	3-0-1	4
			Total Credits	25

SEMESTER III

S.No.	Subject Code	Subject	L-T-P	Credit
1	MAS-590	Engineering Mathematics-III	3-1-0	4
2	EEE-401	Network & System	3-1-1	5
3	ECE-401	Solid State Devices & Circuits	3-1-1	5
4	ECE-402	Switching Theory & Logic Design	2-1-0	3
5	ECE-403	Electronics Workshop And P.C.B Lab	0-0-2	2
6	ECE-404	Electronic Measurement & Measuring instruments	3-1-1	5
7	SES-415	Environmental Studies-I	1-0-1	2
			Total Credits	26

SEMESTER IV

S.No.	Subject Code	Subject	L-T-P	Credit
1	ECE-405	Microprocessor & Application	3-1-1	5
2	EEE-404	Electrical Engineering Materials	2-1-0	3
3	EEE-406	Electromagnetic Theory	3-1-0	4
4	EEE-402	Electrical Machines	3-0-1	4
5	MAS-491	Computer Based Numerical & Statistical Techniques	2-1-1	4
6	ECE-406	Signals & Systems	3-1-0	4
7	Comp-512	Object Oriented Programming	2-1-1	4
8	SES-416	Environmental Studies-II	1-0-1	2
			Total Credits	30

SEMESTER V

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.

Composition & Grammar.

- 3. 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.
- 4. 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 (3-1-1)

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.

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 $K_2Cr_2O_7$ 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 (MAT-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 Cayley-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 (EEE-304)

CREDIT 5 (3-1-1)

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.Gabel/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.
To study resonance by frequency variation in series RLC circuit.
7. To calibrate the given energy meter with the help of a standard wattmeter.
8. To find the relation between line current and phase current and line voltage and phase voltage in Star – Delta connections.
9. To perform open circuit and short circuit test and draw the equivalent circuit of a single-phase transformer.
10. To measure three phase power by two-wattmeter method.
11. To draw the magnetizing characteristic of a single-phase transformer.

ENGINEERING MECHANICS

SUB. CODE (CE-350)

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.

BASIC ELECTRONICS

SUB CODE: (ECE-310)

CREDITS 4 (2-1-

1)

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-310)
2(0-0-3)

CREDIT

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, Charoathar 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).

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.
- 5.

MECHANICAL ENGINEERING

SUB.CODE (ME-330)
(3-1-2)

CREDIT 5

(A) Thermodynamics

Fundamental Concepts and Definitions

Introduction to SI units, Definition of thermodynamics, System, Surrounding and universe, Phase, Concept continuum, Macroscopic and Microscopic point of view, Density, Sp. Volume, Pressure, Thermodynamic equilibrium, Property, State, Path, Process, Cyclic process, Quasi-static process, Reversible and irreversible process, Energy and its forms, Work and heat, NTP and STP.

Ideal and Real Gases

Concept of ideal gas, characteristic equation of gas. Universal and characteristic gas constant. Enthalpy and specific heat, Deviation of real gas from ideal gas, compressibility factor and the Van der Waal's equation of state for real gas.

Laws of Thermodynamics

Zeroth Law: Concept of temperature. Equality of Temperature, Zeroth law, Principle of thermometry and temperature scale.

First Law: First Law of thermodynamics. Concept processes, Flow processes and control volume, Flow work, Steady flow energy equation, Mechanical work in a steady flow process, Throttling process, Application of first law to open systems.

Second Law: Essence of second law. Thermal reservoir. Heat Engines and thermal efficiency, COP of heat pump and refrigerator. Definition of available and unavailable energy, Statement of second law, Carnot cycle, Carnot's theorem, Clausius inequality, Concept of Entropy, Entropy change for ideal gases.

Properties of steam

Generation of steam at constant pressure. Various states of water, Properties of steam, Use of property diagram, Process of vapour in closed and open system, Determination of dryness fraction of steam by separating and throttling Calorimeter, Rankin cycle.

Thermodynamic Cycles

Definitions of bore, Stroke clearance ratio, Compression ratio, Definition and calculation of mean effective pressure from the cycle work (proof not required), Indicated pressure, Air standard cycles (Otto and Diesel cycles), Principle of working and description of two and four stroke SI and CI engines.

(B) Strength Of Materials

Simple Stresses and Strains

Stress- tensile and compressive, strain, strain energy, stress-strain diagram, ductile and brittle material, elastic constants, impact loading, varying cross-section and load, temperature stresses, shear stress, complimentary shear stress, shear strain, strain energy.

Compound Stress and Strains

State of stress at a point, Oblique stress, simple tension, pure shear, general two-dimensional stress system, principle planes, principle stresses and strains, Mohr's stress circle, Poisson's ratio, Maximum shear stress.

Bending Stress

Pure bending, Moment of inertia, Section modulus, Bending stresses, combined bending and direct stress, beam of uniform strength, middle third and Middle quarter rules for rectangular and circular sections.

Torsion

Circular shafts, Torsional shear stress, Strain energy in torsion, Shafts under varying torque, Compound shafts, Combined bending and twisting.

References:

1. Van Wylen G.J & Sonntag R.E: Fundamentals of classical thermodynamics, John Wiley & Sons, Inc. NY.
2. Wark Wenneth: Thermodynamics (2nd edition), McGraw Hill book Co. NY)
3. Yadav R.: Thermodynamics and Heat Engines, Vol. I & II (SI Edition) Central Publishing House, Allahabad.
4. Yadav R.: Steam and Gas Turbines.
5. Kshitish Chandra Pal: Heat Power, Orient Longman Limited, 17, Chittranjan Avenue, Calcutta.
6. S. Rao, B.B. Parulekar: 'Energy Technology', Khanna Pub, New Delhi.
7. G.H. Ryder:" Strength of Materials".

LIST OF PRACTICALS

1. Study of boiler models- Babcock Wilcox, Lancashire and Locomotive.
2. Study of Steam engine and steam turbine models.
3. Study of 2-stroke and 4-stroke I.C.E models.
4. Study of Fiat engine and/or Diesel engine prototype.
5. Study of vapour compression Refrigeration unit tutor/refrigerator.
6. Study of a window type air conditioner.
7. To conduct the tensile test on a UTM and determine ultimate Tensile strength, percentage elongation for a steel specimen.
8. To conduct the compression test and determine the ultimate compressive strength for a specimen.

Computer & languages

**Course Code: COMP-410
2+1+2)**

Credit: 4(

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 (COMP-410)

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:
 $n - n^2/2! + n^3/3! - n^4/4! + \dots$
6. To find sum and average of n integers using a linear array.
7. To read n numbers from the keyboard and display these numbers in the reverse order their entry.
8. To sort a given list using either selection or bubble sort.
9. To search a given number within a linear array.
10. To perform Addition, Multiplication, Transpose of matrices.
11. To generate the fibonacci series using a function.
12. To find factorial of a given number using a function.
13. To interchange two values using
 - i. i) Call by value.
 - ii. ii) Call by reference.
14. Write a C program to display the mark sheet of a student using structure.

WORKSHOP PRACTICE

SUB. CODE (ME-310)

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-320)

CREDIT 2 (0-0-3)

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).

PRINCIPLES OF PROGRAMMING LANGUAGES

Course Code: CSE-431
1-0)

Credits: 4 (3 –

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 requirements, Theoretical models, 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'

Course Code: CSE 432
1- 1)

Credits: 5 (3-

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.

OPERATING SYSTEMS

Course Code : CSE 433

Credits: 5(3-1-1)

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

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. Deadlock- 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

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 of Linux Operating System: Kernel Models, File system, Inter-Process Communication, Security.

Text Book(s) :

1. Silverschatz, 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. Stallng, William, "Operating System", Maxwell Macmillan
6. Crowley, "Operating System", TMH.

WEB TECHNOLOGY

Course Code : CSE-434

Credits : 3(2-0-1)

UNIT-I

Introduction: History of the Web, 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.

UNIT-II

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

UNIT-III

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 IV

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

UNIT V

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

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.

BASIC ELECTRONICS

Course Code: (ECE-310)

Credits: 4 (2-1-1)

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.

Reference Books:

5. Boylestad & Nashelsky/Electronic Devices & Circuits/ PHI.
6. Morris Mano/Digital Computer Design/ PHI.
7. Milliman, J. Halkias/Integrated Electronics/TMH.
8. Malvino & Leach/Digital Principles & Application/

DISCRETE MATHEMATICS

Course 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

ENVIRONMENTAL STUDIES-I

Course Code SES-415

Credits 2(2 – 0 - 0)

1: The Multidisciplinary Nature of Environmental Studies.

Definition, Scope and Importance.

(i) Ecosystems.

Concept of an Ecosystem.

Structure and function of an Ecosystem.

Producers, consumers and decomposers.

Energy flow in the ecosystem.

Ecological succession.

Food chains, food webs and ecological pyramids.

Introduction, types, Characteristics features, structures and function of the following ecosystem:

(a) Forest Ecosystem.

(b) Grassland Ecosystem.

(c) Desert Ecosystem.

(d) Aquatic Ecosystem (Ponds, streams, lakes, rivers, oceans, estuaries).

(ii) Social Issues and the Environment

From unsustainable to sustainable development.

Urban problems related to energy.

Water conservation, rain water harvesting, water shed management.

Resettlement and rehabilitation of people; its problems and concerns case studies.

Environmental ethics: Issues and possible solutions.

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust,

Case studies

Wasteland reclamation.

Consumerism and waste products.

Environment Protection act.
Air (Prevention and Control of Pollution) Act
Visit to local polluted site-Urban/Rural/industrial/Agricultural.
Study of Common plants, insects, birds.
Study of simple ecosystems-ponds, river. Hillslopes etc(Field work equal to 5 lecture hours).
Issues involved in enforcement of environmental legislation; public awareness.

OBJECT ORIENTED PROGRAMMING

Course Code : CSE 442

Credits : 5(3-1-1)

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

Advanced 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
6. Berzin Joseph, "Data Abstraction: the object oriented approach using C++", McGraw Hill
7. Mercer, "Computing Fundamental with C++", Palgrave Macmillan

COMPUTER ORGANIZATION

Course Code: CSE 443

Credits: 4(3-1-0)

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)

ATABASE MANAGEMENT SYSTEMS

Course Code: CSE 441

Credits: 5(3+1+1)

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

Course Code: ECE-440

Credits: 5 (3-1-1)

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.

Reference Books:

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.

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

Course Code : MAS 661

Credits : 4(2+1+1)

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.

Reference Books:

- 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

ENVIRONMENTAL STUDIES-II**Course Code SES-416****CREDITS 2(2 – 0 -****0)****1) Natural Resources.**

- (a) Forest resources.
 - (b) Water resources.
 - (c) Mineral resources.
 - (d) Food resources.
 - (e) Energy resources.
 - (f) Land resources.
- Role of an individual in conservation of natural resources.
Equitable use of resources for sustainable life style.

2) Biodiversity and its conservation.

- (a) Introduction -Definition: genetic, species and ecosystem diversity.
- (b) Bio geographical classification of India.
- (c) Value of diversity: consumptive use, productive use, social, ethical aesthetic and option values.
- (d) Biodiversity at global, National and local levels.
- (e) India as mega-diversity nation.
- (f) Hot-Spots of biodiversity.
- (g) Threats to biodiversity: habitat loss, poaching of wild life, man-wild life conflicts.
- (h) Endangered and endemic species of India.
- (i) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

3) Environment Pollution.

Definition
Causes effect and control measures of

- (a) Air Pollution.
- (b) Water Pollution.
- (c) Soil Pollution.
- (d) Marine Pollution.
- (e) Noise Pollution.
- (f) Thermal Pollution.
- (g) Nuclear Hazard.

Solid waste Management: Causes, effect and control measures of urban and industrial wastes.

Role of an individual in prevention of pollution.

Pollution case studies.

Disaster Management: floods, earthquake, cyclone and landslides.

List of Experiments:

- (1) Identification and study of different Natural Resources.
- (2) Determination of Chloride of water sample.
- (3) Determination of pH of water sample.
- (4) Determination of Acidity of water sample.
- (5) Determination of Hardness of water sample.
- (6) Determination of Alkalinity of water sample.
- (7) Determination of Turbidity of water sample.
- (8) Identification of different tools for measurement of Environmental pollution.

COMPUTER NETWORKS

Course Code: CSE 551

Credits: 5(3-1-1)

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

**Course Code : CSE 552
1-1)**

Credits : 5(3-

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, Binomial Heaps, Fibonacci Heaps, Data Structure for Disjoint Sets, Hash tables.

UNIT -III

Advanced Design and Analysis Techniques: Dynamic programming, Greedy Algorithms, 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 Book :

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

Course Code: CSE 553

Credits: 4(2-1-1)

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.

Introduction to 8085 microprocessor.

UNIT-II

16-bit 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.

Reference Books :

1. Gaonkar , Ramesh S , "Microprocessor Architecture, Programming and Applications with 8085", Penram International Publishing.
2. Ray A K , Bhurchandi K M , "Advanced Microprocessors and Peripherals", TMH
3. Hall D V , "Microprocessor Interfacing", TMH
4. Liu and Gibson G A , " Microcomputer System: The 8086/8088 family" ,PHI
5. Aditya P Mathur, " Introduction to Microprocessor", TMH
6. Brey, Barry B, "INTEL Microprocessors", PHI
7. Renu Sigh & B.P.Sigh, "Microprocessor, Interfacing and Applications
8. M Rafiqzaman, "Microprocessors, Theory and Applications",

THEORY OF AUTOMATA AND FORMAL LANGUAGES

Course Code: CSE 554

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): Basic concepts, 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)", PPM

ELEMENTS OF ECONOMICS AND PRINCIPLES OF MANAGEMENT SCIENCE

Course Code (BAM-315)

Credits 4(3-1-0)

Industrial Economics;

1. **Introduction:** -Nature and significance of economics, meaning of science, Engineering and technology and their relationship with economic development.
2. **Basic concept:** - The concept of demand and supply, indifference curve analysis, price effect, income effect and substitution effect.
3. **Money and banking:** - Function of money, value of money, inflation and measure to control it. Brief idea function of banking system, viz; commercial and central banking, business fluctuation.

Management:

4. **Introduction:** Definition, nature and significance of management, evaluation of management thought, contribution of Max Weber, Taylor and Fayol.
5. **Human behaviour:** Factors of individuals' behaviour, perception. Learning and personality development, inter personal relationship and group behaviour.

References:

1. Dewett, K.K./Modern Economics Theory.
2. Luthers, Fred / Organizational Behaviours.
3. Prasad L.M/ Principles of Management
4. A.W. Stonier &D.C Hergne/ A Text Book of Economics Theory /Oxford Publishing House Pvt Ltd

SOFTWARE ENGINEERING

**COURSE CODE : CSE 561
3-1-0)**

CREDITS : 4(

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, Software Process.

UNIT-II

Software Requirement Specification: Analysis, Principles, Water Fall Model, The Incremental Model, Prototyping, Spiral Model, Role of management in software development, Role of matrices and Measurement, Problem Analysis, Requirement specification, Monitoring and Control.

UNIT-III

Software-Design: Design principles, problem partitioning, abstraction, top down and bottom up-design, Structured approach, functional versus object oriented approach, design specifications and verification, Monitoring and control, Cohesiveness, coupling, Forth generation techniques, Functional independence, Software Architecture, Transaction and Transform Mapping, Component – level 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, reliability assessment, 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.

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

Course Code : CSE 562

Credits : 5(3-1-1)

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

Course Code : CSE 563

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

Course Code: CSE – 564

Credits: 5(3-1-1)

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 Painter's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods, fractal - geometry.

Text Book:

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

Reference Books:

1. Foley, Van Dam, 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

ORGANIZATIONAL BEHAVIOR

Course 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, RS., Human relations and organizational behavior: a global perspective, Macmillan India Ltd., Delhi, .1995.

SOFTWARE PROJECT MANAGEMENT

Course Code : CSE-571

Credits : 4(2-1-

1)

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

Course Code : CSE 572

Credits : 5(3-1-1)

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, Pass 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, Reentrant 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

Reference 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

ADVANCE JAVA PROGRAMMING

Course Code: CSE 573
4(2-1-1)

Credits :

UNIT-I

Java Programming: Introduction, Operators, Data types, Variables, Methods & Classes, Class hierarchies and abstract classes: inheritance, subclasses, abstract classes and interfaces, casting, final classes, Multithread Programming, I/O, Java Applet.

UNIT -II

Java Library: String Handling, Input/Output exploring Java.io, Networking, Applets classes, Event Handling, Introduction to AWT, Working with window, Graphics, AWT Controls, Layout Manager and Menus, Images, Additional packages.

UNIT III

Servlet: Basic concepts, Introduction , HTTP, Servlet life cycle , web application structure, Understanding web.xml , GET and POST method, Retrieving parameters from request, sending a response , Re-directing a request, using Request Dispatcher, Session management, Handling cookies , Creating war files, MVC Architecture & Struts framework.

UNIT –IV

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

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

Database Connectivity: Database Programming using JDBC, Studying Javax.sql.*package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

Latest Technologies : Introduction to Hibernate, 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, "Web Programing Building 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

NET TECHNOLOGY

Course Code : CSE 574

Credits : 4(2-1-1)

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 OPERATION RESEARCH

Course Code: MAS-651
1-0)

Credits: 4(3-

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 Kuperfersch 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

Elective –I

ADVANCE COMPUTER NETWORKS

Course Code : CSE 611

Credits : 4(3-1-0)

UNIT-I Overview of Wired and Wireless Data Networks:

Review of Layered Network Architecture: ISO-OSI and TCP/IP Network Model. Datagram Networks and Virtual Circuit Networks. IEEE 802.3u(Fast Ethernet) and IEEE 802.3z(Gigabit Ethernet). Virtual LAN, Wireless LAN: IEEE 802.11, Bluetooth. Broadband Wireless LAN: 802.16, WIMAX.

UNIT-II: Internetworking

Review of IP Addressing and Routing. Internet Architecture: Layer 3 Switch, Edge Router and Core Router. Overview of Control Plane, Data Plane and Management Plane. Internet Routing Protocols: OSPF, BGP, Broadcast and Multicast Routing, Mobility Issues and Mobile IP.

Adhoc Routing: Basic concepts, Routing Protocols: Dynamic source Routing, Destination Sequenced Distance Vector Routing, Ad hoc On-Demand Distance Vector Routing.

UNIT-III : Transport Layer Protocols

Process to process Delivery, Review of UDP and TCP. SCTP Protocol: Services, Packet Format, Association, Error Control, Wireless TCP and RTP, RTCP. Real Time Applications: Voice and Video over IP.

UNIT-IV : Traffic Control and Quality of ServiceFlow Control: **Flow Model, Open Loop : Rate Control, LBAP, Closed Loop : Windows Scheme, TCP and SCTP flow control.**

Congestion Control: Congestion Control, in packet networks, ECN and RED Algorithm, TCP and SCTP congestion control.

Traffic management Framework: Scheduling, Renegotiation, Signaling, admission control, capacity planning.

UNIT- V: Network Security

Security Issues, Symmetric Encryption: DES, Triple DES, Modes, AES. Public Key Cryptography: RSA, Diffie Hellman, Elliptic Curve. Introduction to Hashing Algorithms. Protocols: Kerberos, SSL/TLS, IPsec.

Text Books :

1. Srinivasan Keshav " An Engineering Approach to Computer Networking", Pearson
2. Forouzen, "TCP/IP", TMH

Reference Books :

1. W. Stallings, " High Speed Networks and Internets", Pearson
2. W. Stallings, "Wireless Communication and Networks", Pea
3. W. Stallings, " Crptography and Network Security", Pearson

DATA MINING AND DATA WAREHOUSING**Course Code : CSE-612****Credits : 4(3-1-0)****UNIT-I**

Overview, Motivation (for Data Mining), Data Mining-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data,(Binding, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation.

Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation.

UNIT-II

Concept Description:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparison, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases

UNIT-III**Classification and Predictions:**

What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multi layer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbor classifiers, Genetic Algorithm.

Cluster Analysis:

Data types in cluster analysis, Categories of clustering methods, Partitioning methods.

Hierarchical Clustering- CURE and Chameleon.

Density Based Methods-DBSCAN, OPTICS.

Grid Based Methods- STING, CLIQUE.

Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis

UNIT-IV

Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.

UNIT-V

Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse.

Reference Book:

1. M.H.Dunham,"Data Mining:Introductory and Advanced Topics" Pearson Education
2. Jiawei Han, Micheline Kamber, "Data Mining Concepts & Techniques" Elsevier
3. Sam Anahory, Dennis Murray, "Data Warehousing in the Real World : A Practical Guide for Building Decision Support Systems, 1/e " Pearson Education

4. Mallach, "Data Warehousing System", McGraw –Hill

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code : CSE-613

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", PHIL

Books:

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

OBJECT ORIENTED MODELING

Course Code : CSE-614

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: UML

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

ARTIFICIAL INTELLIGENCE

Course Code: CSE 581

Credits: 4(2-1-1)

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 Elective -II

DIGITAL IMAGE PROCESSING

Course Code: CSE 621

Credits: 4(2-1-1)

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.

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

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.

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

Reference 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.

MOBILE COMPUTING**Course Code: CSE 622**
1)**Credits: 4(2-1-****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.

Reference Books:

1. J. Schiller, Mobile Communications, Addison Wesley.
2. A. Mehrotra, GSM System Engineering.
3. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
4. Charles Perkins, Mobile IP, Addison Wesley.
5. Charles Perkins, Ad hoc Networks, Addison Wesley

DISTRIBUTED COMPUTING**Course Code: CSE –623****Credits: 4(2-1-1)****UNIT I**

Introduction: Goals - Hardware Concepts - bus based multiprocessor - switched multiprocessor - bus based Multicomputer – switched Multicomputer - Software Concepts- Network Operating Systems –

True Distributed System - Multiprocessor time-sharing system – Design issues. Communication-Layered Protocols - ATM networks.

UNIT II

Client Server Model: Basic concepts, Remote Procedure Call - Group Communication – Synchronization: Clock Synchronization – Mutual Exclusion – Election Algorithms – Atomic Transaction.

UNIT III

Deadlock: Basic concepts - Threads - System models - Processor Allocation - Scheduling in Distributed Systems - Fault Tolerance - Real time distributed systems.

UNIT IV

Distributed file systems : Distributed file system design – implementation – Trends in Distributed File Systems – Distributed shared memory - consistency models – page based distributed shared memory - shared variable distributed shared memory – Distributed Programming languages

UNIT V

Case studies: Amoeba : Introduction – Objects and capabilities in Amoeba – Process and Memory Management in Amoeba – Communication in Amoeba – The Amoeba Services. DCE : Introduction – Threads – Remote Procedure call – Time, Directory Service and Security Services – Distributed File System.

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, New Delhi, 2001.

Course Code: CSE 624

Credits: 4(2-1-1)

UNIT – I

Overview: Definition, History, Myths, Transition to Client Server Computing, Database Architectures, advantages and disadvantages of Client Server Architecture.

UNIT-II

Components : Client, Server, Network, role and services of Client-Server, selection of Operating System as Client & Server, types of Client & Servers, connectivity, messaging and peer-to-peer communication, role of OSI layer in Client Server, TCP/IP Networks.

UNIT- III

Middle-ware : Definition, Role, 2 tier v/s 3 tiers, Network File System, Network Operating System, API, RPC model & implementation, IPC.

UNIT-IV

Database Server: Memory and Process Architecture, SQL and PL SQL.

Client/Server processing: Transaction Processing, Remote Processing, Distributed Processing.

Developing and Managing C/S Applications: Development tools, Network management, Backup and Recovery, data Integrity & Security.

UNIT-V

Distributed objects: CORBA, COM, DCOM, OLE, Java-RMI, etc., ODBC & JDBC connectivity.

Reference Books:

1. Client server Computing : Patrick Smith
2. Client server application and architecture : Jeffrey D. Schank
3. Client Server survival guide, 3 rd Edition : Robert Orfali
4. Client server unleashed