BE-101 (ENGINEERING CHEMISTRY)

Unit I
WATER AND ITS INDUSTRIAL APPLICATIONS : Sources, Impurities, Hardness & its units, Industrial water characteristics, softening of water by various methods (External & Internal treatment), Boiler trouble causes, effect & remedies, Characteristics of municipal water & its treatment, Numerical problems based on softening methods.

Unit II
FUELS & COMBUSTION: Fossil fuels & classification, Calorific value, Determination of calorific value by Bomb calorimeter Proximate and Ultimate analysis of coal and their significance, calorific value Computation based on ultimate analysis data, Carbonization, Manufacturing of coke & recovery of by products. Knocking, relationship between' knocking & structure of hydrocarbon, improvement of anti knocking characteristics of IC engine fuels, Diesel engine fuels, Cetane number, combustion and it related numerical problems.

Unit III
LUBRICANTS: Introduction, Mechanism of lubrication, Classification of lubricants, roperties and Testing of lubricating oils, Numerical problems based on testing methods.

CEMENT & REFRACTORIES: Manufacture , IS-code, Setting and hardening of cement, Refractory : Introduction,classification and properties of refractories .

Unit IV
HIGH-POLYMER : Introduction, types and classification of polymerization, Reaction. Mechanism, Natural & Synthetic Rubber; Vulcanization of Rubber, Preparation, Pro perties & uses of the following- Polythene, PVC, PMMA, Teflon, Poly acrylonitrile, PVA, Nylon 6, Nylon 6:6, Terylene, Phenol formaldehyde, Urea - Formaldehyde Resin, Glyptal, Silicone Resin, Polyurethanes; Butyl Rubber, Neoprene, Buna N, Buna S.

Unit V
A.   INSTRUMENTAL TECHNIQUES IN CHEMICAL ANALYSIS : Introduction, Principle, Instrumentation andapplications of IR, NMR,UV, Visible,Gas Chromatography,Lambert's and Beer's Law
B.   WATER ANALYSIS TECHNIQUES : Alkalinity, hardness (Complexo-metric), Chloride, Free chlorine,DO, BOD and COD, Numericalproblems based on above techniques.

Reference books:

1.   Chemistry for Environmental Engineering & Science- Sawyer, McCarty and Parkin –McGraw Hill, Education Pvt. Ltd., New Delhi

2.   Engineering Chemistry - B.K. Sharma, Krishna Prakashan Media (P) Ltd., Meerut.
3.   Basics of Engineering Chemistry - S. S. Dara & A.K. Singh, S. Chand & Company Ltd., Delhi
4.   Applied Chemistry - Theory and Practice, O.P. Viramani, A.K. Narula, New Age International Pvt.Ltd.Publishers, New Delhi
5.   Polymer Science – Ghosh, Tata McGraw Hill.
6.   Engg. Chemistry –Shashi Chawla, Dhanpat Rai & company pvt. Ltd, Delhi.
7.   Engg. Chemistry –Jain & Jain, Dhanpat Rai & company pvt. Ltd, New Delhi
8.   A Text book of Engg. Chemistry- Agrawal, C.V, Murthy C.P, Naidu, A, BS Publication,Hyderabad.

Engineering Chemistry Practical

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

1.   Water Testing

(i)Determination of Totalhardness by Complexometric titration method.

(ii)   Determination of mixed alkalinity

(a) OH^- & CO_3^{--}

(b) CO_3^{--} & HCO_3^-

(iii)   Chloride ion estimation by Argentometric method.

2.   Fuels & lubricant testing:
(i)   Flash & fire points determination by
a)   Pensky Martin Apparatus,
b)   Abel's Apparatus,
c)   Cleveland's open cup Apparatus.
d)   Calorific value by bomb calorimeter
(ii)   Viscosity and Viscosity index determination by
a)   Redwood viscometer No.1
b)   Redwood viscometer No.2
(iii)   Proximate analysis of coal
a)   Moisture content
b)   Ash content
c)   Volatile matter content
c) Carbon residue
(iv)   Steam emulsification No & Anline point determination
(v)   Cloud and Pour point determination of lubricating oil
3.   Alloy Analysis
(i)Determination of percentage of Fe in an iron alloy by redox titration using N-Phenylanthranilic acid as internal indicator.
(ii)   Determination of Cu and or Cr in alloys by Iodometric Titration.
(iii)   Determination of % purity of Ferrous Ammonium Sulphate & Copper Sulphate.

BE-102 (MATHEMATICS-I)

Unit I

DIFFERENTIAL CALCULUS :
Expansion of functions by Maclaurin's and Taylor's theorem. Partial differentiation, Euler's theorem and its application in approximation and errors, Maxima and Minima of function of two variables, Curvature : Radius ofcurvature, centre of curvature.

Unit II
INTEGRAL CALCULUS :
Definite Integrals : Definite Integrals as a limit of a sum , its application in Summation of series, Beta and Gamma Functions , Double and Triple Integrals, Change of Order of Integration, Area,Volume and Surfaces using double and triple Integral.

Unit III
DIFFERENTIAL EQUATIONS :
Solution of Ordinary Differential Equation of first order and first degree for Exact differential Equations, Solution of Ordinary Differential Equation of first order and higher degree (solvable for p, x and y, Clairauts Equation), Linear Differential Equations with Constant Coefficients, Cauchy's Homogeneous differential Equation, Simultaneous differential Equations, Method of Variation of Parameters

Unit IV
MATRICES :
Rank, Solution of Simultaneous equation by elementary transformation, Consistency of System of Simultaneous Linear Equation, Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem and its Application to find the inverse

Unit V
Algebra of Logic, Boolean Algebra, Principle of Duality, Basic Theorems, Boolean Expressions andFunctions.Elementary Concept of Fuzzy Logic
Graph Theory : Graphs, Subgraphs, Degree and Distance, Tree, cycles and Network,

References:
(i) Advance Engg. Mathematics. By Ramana, Tata McGraw hill.
(ii)   Higher Engineering Mathematics by BS Grewal, Khanna Publication
(iii)   Advance Engineering Mathematics by D.G.Guffy
(iv)   Engineering Mathematics by S S Sastri. P.H.I.
(v)   Mathematics for Engineers by S.Arumungam, SCITECH Publuication

BE-103 (C0MMUNICATION SKILLS)

Unit I - Languages and skills of communication

Communication, Processes of Communication, Verbal and Non Verbal Communication, Grapevine Communication, Barriers to Communication, English phonetic symbols/sings.

Unit II - Application of linguistic ability
Reading comprehension, methods & importance etc., Listening skill , hearing & listening & Principles of Efficient Listening, Barriers to Listening.

Unit III - Letter Writing:
Applications, Enquiry, Calling quotations, Tenders, Order and Complaint, Bio Data, curriculum Vitae, & ResumeWriting.

Unit IV
Precise Writing, Noting and drafting, Technical Description of simple engineering objects and processes(writing), Report precise writing, Note writing, Slogan writing comment, Speech advertising.

Unit V
Writing Technical reports of the type of observation report, Survey report, Report of trouble, Laboratory Report and Project Report on the subjects of engineering. (Speaking) Vocabulary, Presentations, Demonstrations, Conversation – Telephone media, socializing, cultural events, Group Discussion, Debates, speech.

Communication Language Lab. (BE 103)
Course objective : The language lab focuses on the production and practice of sounds of English through audio – visual aids and Computer software. It intends to enable the students to speak English correctly with confidence and intends to help them to overcome their inhibitions and self – consciousness while speaking in English.

Topics to be covered in the Language laboratory sessions :

1. Basic Grammar & Vocabulary (Synonyms /Antonyms, Analogies, sentence completion,correctly spelt words, idioms, proverbs, common errors).
2. phonetic symbols and pronunciation.
3. Listening skills (Including Listening Comprehension)3
4. Reading Skills (Including Reading Comprehension)
5. Writing Skills (Including structuring resume and cover letter)
6. Speaking Skills
7. Body Language
8. Oral Presentation : Preparation and delivery using audio – visual aids with stress n bodylanguage and voicemodulation (Topic to be selected by theteacher.)

Final Assessment Should be based on Assignment, presentation and interview.

Reference Books :-
1.   Business Correspondence and Report Writing - By Sharma; TMH.

2.   Living English Structure – By W.S. Allen; Longmans.

BE-104 (Electrical & Electronics Engineering)

UNIT-I

Electrical circuit analysis- Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's &superposition theorem, star-delta transformation.

UNIT-II

phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.**Transformers-**Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

UNIT-III

Rotating Electric machines-Constructional details of DC machine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3- Phaseinduction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Classification of self excited DCmotor and generator.

UNIT-IV

Digital Electronics-Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, AND, OR, NOT, NOR, NAND, EX- NOR, EX-OR gates and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flip flop.

UNIT-V

ELECTRONIC COMPONENTS AND CIRCUITS- Introduction to Semiconductors, Diodes, V-I characteristics, Bipolar junction transistors (BJT) and their working, introduction to CC, CB & CE transistor configurations, different configurations and modes of operation of BJT, DC biasing of BJT.

References:

1.   Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, IIEdition
2.   S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
3.   Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, IIEdition
4.   Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH.
5.   J.S. Katre, Basic Electronics Engg, Max Pub. Pune.
6.   Hughes, Electrical and Electronic Technology, Pearson Education IX Edition

List Of Experiments

1. Verificatiions of Thevenin's Superposition theorem.
2. Study of Transformer, name plate rating, determination of rayio and polarity.
3. Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions and verification by load test.
4. Seperation of resistance and inductance of choke coil.
5. Measurement of various line & phase quantities for a 3-phase circuit.
6. Identification of different Electronics components.
7. Observing input and output waveforms of rectifiers.
8. Transistor application as amplifier and switch.
9. Verification of truth table for various gates.

BE-105 (Engineering Graphics)

Unit I
Scales: Representative factor, plain scales, diagonal scales, scale of chords.
Conic sections: Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent.
Special Curves: Cycloid, Epi-cycloid, Hypo-cycloid, Involutes, Archimedean and logarithmic spirals.

Unit II
Projection: Types of projection, orthographic projection, first and third angle projection, **Projection of points and lines**, Line inclined to one plane, inclined with both the plane, True Length and TrueInclination, Traces of straight lines.

Unit III
Projection of planes and solids: Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions.

Unit IV
Section of Solids: Section of right solids by normal and inclined planes; Intersection of cylinders. **Development ofSurfaces**: Parallel line and radial - line method for right solids
.

Unit V

Isometric Projections: Isometric scale, Isometric axes, Isometric Projection from orthographic drawing.**Computer Aided Drafting (CAD)**: Introduction, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD.

References
1.   Visvesvaraya Tech. University; A Premier on Computer Aided Engg drawing; VTU Belgaum
2.   Bhatt N.D.; Engineering Drawing, Charotar
3.   Venugopal K.;Engineering Graphics; New Age
4.   John KC; Engg. Graphics for Degree; PHI.
5.   Gill P.S.; Engineering Drawing;kataria
6.   Jeyopoovan T.; Engineering drawing & Graphics Using AutoCAD; Vikas
7.   Agrawal and Agrawal; Engineering Drawing;TMH
8.   Shah MB and Rana BC; Engg.drawing; Pearson Education
9.   Luzadder WJ and Duff JM; Fundamental of Engg Drawing; PHI 10JolheDA; Engg. Drawing an Introduction; TMH
10.   Narayana K.L.; Engineering Drawing; Scitech

List of Practical: Sketching and drawing of geometries and projections based on above syllabus

BE-106 (Work Shop Practice)

Unit I

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly process. Powder Metallurgy, introduction to computers in manufacturing. Black Smithy Shop
Use of various smithy tools. Forging operations:Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting.Suggested Jobs : Forging of chisel., forging of Screw Driver

Unit II
Carpentry Shop:
Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints.
Suggested Jobs :Name Plate ,Any of the Carpentry joint like mortise or tennon joint

Unit III
Fitting Shop:
Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.Suggested Jobs :Preparation of job piece by making use of filling, sawing and chipping
, drilling and tapping operations.

Unit IV
Foundry:
Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Corebox and core print, .Use and care of tools used for making wooden patterns.
Moulding:
Properties of good mould & Core sand, Composition of Green , Dry and Loam sand. Methods used to preparesimple green and bench and pit mould dry sand bench mould using single pieceand split patterns.

Unit V
Welding: Study and use of tools used for Brazing, Soldering, Gas & Arc welding. PreparingLap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes
. Safety precautions.

Reference Books:
1.   Bawa HS; Workshop Practice, TMH

2.   Rao PN; Manufacturing Technology- Vol.1& 2, TMH
3.   John KC; Mechanical workshop practice; PHI
4.   Hazara Choudhary; Workshop Practices -, Vol. I & II.5 Jain. R.K. ProductionTechnology -

B.E.- 201-Engineering Physics

Unit I

Quantum Physics : Group and particle velocities & their relationship. Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit). Compton scattering. Wave function and its properties,energy and momentum operators, time dependent and time independent Schrödinger wave equation.
Application of time independent Schrödinger wave equation to particle trapped in a one dimensional squarepotential well (derivation of energy eigen values and wave function)

Unit II Wave optics

Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted lght), interference from a wedge shaped thin film, Newton's rings and Michelson's interferometer experiments and their applications. Diffraction at single slit, double slit and n-slits (diffraction grating). Resolving power of grating and prism. Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate.

Unit III
Nuclear Physics : Nuclear liquid drop model (semi empirical mass formula), nuclear shell model, Linear Particle acceleratos: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron. Geiger- Muller Counter, Motion of charged particles in crossed electric and magnetic fields. Uses of Bainbridge and Auston mass Spectrographs.

Unit IV
Solid State Physics : Qualitative discussion of Kronig Penny model (no derivation), Effective mass, Fermi- Dirac statistical distribution function, Fermi level for Intrinsic and Extrinsic Semiconductors, Zener diode, tunnel diode, photodiode, solar-cells, Hall effect.

Superconductivity: Meissner effect, Type I and Type II superconductors, Di-electric polarization, Complex permittivity, dielectric losses

UNIT V
Laser and Fiber Optics :

Laser: Stimulated and spontaneous processes, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristics of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd:YAG, He-Ne & Carbon dioxide Lasers with energy level diagram.. Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber (Ray theory) pulse dispersion, attenuation, losses & various uses.Applications of lasers andoptical

Reference Books: -

1. Optics By Ghatak, TMH
2. Engineering Physics- V. S. Yadava, TMH
3. Optics by Brijlal and Subhraininyan.
4. Engineering physics by M.N. Avadhanulu and. S. Chand & Co.(2004)
5. Atomic and Nuclear physics by Brijlal and Subraminiyan.
6. Concepts of Modern Physics- Beiser, TMH
7. Solid State Physics by Kittel ,Wiley India
8. Fundamentals of Physics-Halliday, Wiley India

List of suggestive core experiments: -

1. Biprism, Newton's Rings, Michelsons Interferometer.

2. Resolving Powers –Telescope, Microscope, and Grating.

3. G.M. Counter

4. Spectrometers-R.I., Wavelength, using prism and grating

5. Optical polarization based experiments: Brewster's angle, polarimeter etc.

6. Measurements by LASER-Directionality, Numerical aperture, Distance etc.

7. Uses of Potentiometers and Bridges (Electrical)..

8. Experiments connected with diodes and transistor.

9. Measurement of energy band gap of semiconductor.

10. To study Hall effect.

11. Solar cell.

12. To find the width of s single slit by f He-Ne Laser.

13. To determine the numeral aperture (NA) of a Optical Fibre.

14. To determine plank's constant.

15. Other conceptual experiments related to theory syllabus.

B.E.- 202 (Energy , EcologyEnvironment , & Society)

Unit –I

Energy- Sources of Energy : Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, hydal, nuclear sources.

Unit –II

Ecosystem – Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Cycles in Ecosystem – Water, Carbon, Nitrogen. Biodiversity: Threats and conservation,

Unit –III

Air Pollution & Sound Pollution : Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain. Sound Pollution: Causes, controlling measures, measurement of sound pollution (deciblage),Industrial and non – industrial.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.
Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society, Ethics & Human values– Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study . Preliminary studies regarding Environmental Protection Acts , introduction to value education, self exploration, sanyam & swasthya.

References:

1.   Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics";   Cengage Pub.
2.   Rana SVS ; "Essentials of Ecologyand Environment";   PHI Pub.
3.   Raynold, GW "Ethics in information Technology";   Cengage.
4.   Svakumar; Energy Environment & Ethics in society;   TMH
5.   AK De "Environmental Chemistry";   New Age Int. Publ.
6.   BK Sharma, "Environmental Chemistry" ;   Goel Publ. House.
7.   Bala Krishnamoorthy; "Environmental management";   PHI
8.   Gerard Kiely, "Environmental Engineering" ;   TMH
9.   Miller GT JR; living in the Environment Thomson/cengage
10.   Cunninghan WP and MA; principles of Environment Sc; TMH
11.   Pandey, S.N. & Mishra, S.P. Environment & Ecology, 2011, Ane Books , Pvt. Ltd, New Delhi
12.   Joseph, B. Environmental Studies, 2009 Tata Mcgraw Hill, Edu India Ltd. New Delhi.

B.E.- 203 (Basic Mechanical Engineering)

UNIT- 1

Materials: Classification of engineering material, composition of cast iron and carbon steels on iron-carbon diagram and their mechanical properties; Alloy steel and their applications; stress-strain diagram, Hooks law and modulus of elasticity. Tensile, shear, hardness and fatigue testing of materials.

UNIT-2

Measurement: Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainly analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set; introduction to lath, drilling, milling and shaping machines.

UNIT-3

Fluids: Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernauli's equation for incompressible fluids, viscous and turbulent flow, working principle of fluid coupling, pumps, compressors, turbines, positive displacement machines and pneumatic machines. Hydraulic power & pumped storage plants for peak load management as compared to base load plants.

UNIT-4

Thermodynamics: First and second law of thermodynamics; steam properties, steam processes at constant pressure, volume, enthalpy & entropy, classification and working of boilers, efficiency & performance analysis, natural and induced draught, calculation of chimney height. Refrigeration, vapor absorption & compression cycles, coefficient of perform (COP), refrigerant properties & eco friendly refrigerants.

UNIT-5

Reciprocating Machines: Steam engines, hypothetical and actual indicator diagram; Carnot cycle and ideal efficiency; Otto and diesel cycles; working of two stroke & four stroke petrol & diesel IC engines

Reference Books:-

1. Narula; Material Science; TMH

2. Agrawal B & CM; Basic Mechanical Engg. Wiley India

3. Nag PK, Tripathi et al; Basic Mechanical Engg; TMH

4. Rajput; Basic Mechanical Engg;

5. Sawhney GS; Fundamentals of Mechanical Engg; PHI

6. Nakra and Chaudhary; Instrumentation & measurement; TMH

7. Nag PK; Engineering Thermodynamics; TMH

8. Ganesan; Combustion Engines; TMH

List of Suggestive core Experiments(Please Expand it)

1. Tensile testing of standard mild steel specimen.

2. Experiments on Bernoulli's theorem.

3. Flow measurements by ventury and orifice meters.

4. Linear and angular measurement using, Vernier; micrometer, slip gauge, dial gauge and sine-bar.

5. Study of different types of boilers andmountings.

6. Experiment on mini-boiler (50 Kg/Hour)

7. To find COP of a refrigeration unit.

8. Study of different IC engines & measurement of B.H.P. using rope/belt dynamometer.

9. Analysis of exhaust gases on petrol, diesel & biodiesel engines.

B.E.- 204 (Basic Civil &Mechanics Engineering)

Unit I

Building Materials & Construction

Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar
Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing.
Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability

Unit – II Surveying & Positioning:
Introduction to surveying Instruments – levels, thedolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations bydifferent methods. Reciprocal leveling.

Unit –III Mapping & Sensing:
Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.

Engineering Mechanics

Unit - IV
Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non- concurrent Co-planner forces, free Diagram, Force Diagram and Bow's notations, Application of Equilibrium
Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems

Unit – V
Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area andMass, Radius of Gyration, Introduction to product of Inertia and Principle Axes.

Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supportedbeam with concentrated, distributed load and Couple.

Reference Books:
1. S. Ramamrutam & R.Narayanan; Basic Civil Engineering, Dhanpat RaiPub.
2. Prasad I.B., Applied Mechanics, Khanna Publication.
3. Punmia, B.C., Surveying, Standard book depot.
4. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
5. S.P,Timoshenko, Mechanics of stricture, East West press Pvt.Ltd.
6. Surveying by Duggal – Tata McGraw Hill NewDelhi.
7. Building Construction by S.C. Rangwala- Charotar publications House, Anand.
8. Building Construction by Grucharan Singh- Standard Book House, New Delhi
9. Global Positioning System Principles and application- Gopi, TMH
10. R.C. Hibbler – Engineering Mechanics: Statics & Dynamics.
11. A. Boresi & Schmidt- Engineering Mechines- statics dynamics, Thomson' Books
12. R.K. Rajput, Engineering Mechanics S.Chand & Co.

List of suggestive core Experiments:

Students are expected to perform minimum ten experiments from the list suggested belowby preferably selecting experiments from each unit of syllabus.

S.No. Title

1. To perform traverse surveying with prismatic compass, check for local attraction anddetermine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform leveling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by using Theodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cementSample.
5. To determine the workability of fresh concrete of given proportions by slump test orcompaction factor test.
6. To determine the Compressive Strength of brick .
7. To determine particle size distribution and fineness modulus of course and fineAggregate.
8. To verify the law of Triangle of forces and Lami's theorem.
9. To verify the law of parallelogram of forces.
10. To verify law of polygon of forces
11. To find the support reactions of a given truss and verify analytically.
12. To determine support reaction and shear force at a given section of a simplySupported beam and verify in analytically using parallel beamapparatus.
13. To determine the moment of inertia of fly wheel by falling weight method.
14. To verify bending moment at a given section of a simply supported beam.

B.E.- 205 -(Basic Computer ProgrammeEngineering)

UNIT I

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory &
Storage Systems, I/O Devices, and System & Application Software. Computer Application in e-Business, Bio- Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.
Operating System: Definition, Function, Types, Management of File, Process & Memory. Introdcution to MS word, MS powerpoint, MS Excel

UNIT II

Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS object oriented Programming.
Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions,

UNIT III
Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, Inheritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual functions.
Introduction to Data Structures.

UNIT IV
Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of Different Layers. Internetworking Concepts, Devices, TCP/IP Model. Introduction to Internet, World Wide Web, E-commerce **Computer Security Basics:** Introduction to viruses, worms, malware, Trojans, Spyware and Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Cyber Pornography, Email spoofing, Denial of Service (DoS), Cyber Stalking, ,Logic bombs, Hacking Spamming, Cyber Defamation , pharming Security measures Firewall, Computer Ethics & Good Practices, Introduction of Cyber Laws about Internet Fraud, Good Computer Security Habits,

UNIT V
Data base Management System: Introduction, File oriented approach and Database approach, Data Models, Architecture of Database System, Data independence, Data dictionary, DBA, Primary Key, Data definition language and Manipulation Languages.
Cloud computing: definition, cloud infrastructure, cloud segments or service delivery models (IaaS, PaaS and SaaS), cloud deployment models/ types of cloud (public, private, community and hybrid clouds), Pros and Cons of cloud computing

List of Experiment

1.   Study and practice of Internal & External DOS commands.

2.   Study and practice of Basic linux Commands – ls, cp, mv, rm, chmod, kill, ps etc.
3.   Study and Practice of MS windows – Folder related operations, My-Computer, windowexplorer, ControlPanel,
4.   Creation and editing of Text files using MS- word.
5.   Creation and operating of spreadsheet using MS-Excel.
6.   Creation and editing power-point slides using MS- power point
7.   Creation and manipulation of database table using SQL in MS-Access.08.WAP to illustrate Arithmetic expressions
09. WAP to illustrate Arrays.
10.   WAP to illustrate functions.
11.   WAP to illustrate constructor & Destructor
12.   WAP to illustrate Object and classes.
13.   WAP to illustrate Operator overloading
14.   WAP to illustrate Function overloading
15.   WAP to illustrate Derived classes & Inheritance
16.   WAP to insert and delete and element from the Stack
17.   WAP to insert and delete and element from the Queue
18.   WAP to insert and delete and element from the Linked List

Recommended Text Books:
1.   Fundamentals of Computers : E Balagurusamy, TMH
2.   Basic Computer Engineering: Silakari and Shukla, Wiley India
3.   Fundamentals of Computers : V Rajaraman, PHI
4.   Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.

Recommended Reference Books:
1.   Introduction of Computers : Peter Norton, TMH
2.   Object Oriented Programming with C++ :E.Balagurusamy, TMH
3.   Object Oriented Programming in C++: Rajesh K.Shukla, Wiley India
4.   Concepts in Computing: Kenneth Hoganson, Jones & Bartlett.
5.   Operating Systems – Silberschatz and Galvin - Wiley India
6.   Computer Networks:Andrew Tananbaum, PHI
7.   Data Base Management Systems, Korth, TMH
8.   Cloud Computing, Kumar, Wiley India

BE-206 (Basic Computer Engineering)

UNIT-1

Review of Computer Engineering Fundamentals: Definition, Evolution, Classification, Number System, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory & Storage Systems, I/O Devices & Application Software

UNIT-2
Computer Science & Engineering Application in: Data Processing, Information Systems, Communication, Interworking, World Wide Web, e-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc, Defence.

UNIT-3
Introduction to flowchart, Algorithm, Categories of Programming Languages, Program Design, What are data structures, Introduction to Programming, Security Threats: Viruses, Worms, Malware, Trojans, Spyware, and anti-spyware software, firewall, internet fraud.

UNIT-4
Overview and idea about good computer magazines, Major Computer Science & Engineering Journals, Case Studies/ Success Stories of Computer Engineers, Professional Societies and associations, ComputingEthics & Practices.

TEXT/ REFERENCES:

Subhasis Banerjee, S. Arun Kumar, D. Dubhashi, Introduction to Computer Science,
Peter Nortan,Computing Fundamentals, McGraw Hill India
Peter Norton, Introduction to Computers, TMH
Silakari & Rajesh K Shukla, Basic Computer Engineering, Wiley India GoodKenneth
Hoganson, Concepts in Computing , Jones & Bartlett
RJ Dromey, How to solve it by computer, Prentice Hall India Series, 2007

BE-301(MATHEMATICS- II)

Unit I

Fourier Series: Introduction of Fourier series, Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier transform, Sine and Cosine transform.

Unit II

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T.to solve the ordinary differential equations.

Unit III

Second Order linear differential equation with variable coefficients: Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method.

Unit IV

Linear and Non Linear partial differential equation of first order: Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients. Separation of variable method for the solution of wave and heat equations.

Unit V

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem.

References
(i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
(ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
(iii) Advance Engineering Mathematics by D.G. Guffy
(iv) Mathematics for Engineers by S. Arumungam, SCITECH Publuication
(v) Engineering Mathematics by S S Sastri. P.H.I.

CS-302 Discrete structure

Unit-I

Set Theory, Relation, Function, Theorem Proving Techniques: Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem Function: Definition, type offunctions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction.

Unit-II

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

Unit-III

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers

Unit-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

Unit V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Multinomial Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions,

References:

1. C.L. Liu, "Elements of Discrete Mathematics" Tata McGraw-Hill Edition.
2. Trembley, J.P & Manohar; "Discrete Mathematical Structure with Application CS", McGrawHill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Lipschutz; Discrete mathematics (Schaum); TMH
5. Deo, Narsingh, "Graph Theory With application to Engineering and Computer Science.", PHI.
6. Krishnamurthy V; "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.
7. S k Sarkar " Discrete Mathematics", S. Chand Pub

CS-303 Electronic devices &Digital Circuits

Unit I

Linear wave shaping circuits, Bistable, Monostable & Astable multivibrator, Schmitt trigger circuits & Schmitt-Nand gates. Logic families: RTL, DTL, All types of TTL circuits , ECL, I2L, PMOS, NMOS & CMOS logic, Gated flip-flops and gated multivibrator , Interfacing between TTL to MOS.

Unit II

Decoders, Encoders, Multiplexers, Demultiplexers, Introduction to various semiconductor memories & designing with ROM and PLA. Introduction to Shift Registers, Counters, Synchronous & asynchronous counters, Designing of Combinational circuits like code converters.

Unit III

Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-F converters. Feedback amplifier, negative feedback, voltage-series, voltage shunt, current series and current shunt feedback, Sinusoidal oscillators, L-C (Hartley-Colpitts) oscillators, RC phase shift, Wien bridge, and Crystal oscillators. Power amplifiers, class A, class B, class A B, C amplifiers, their efficiency and power Dissipation.

Unit IV Switching characteristics of diode and transistor, turn ON, OFF time, reverse recovery time, transistor as switch, Multivibrators, Bistable, Monostable, Astable multivibarators. Cllipers and clampers, Differential amplifier, calculation of differential, common mode gain and CMRR using h parameters, Darlington pair, Boot strapping technique. Cascade and cascode amplifier.

Unit V

Operational amplifier characteristics, slew rate, full power bandwidth, offset voltage, bias current, application ,inverting , non inverting amplifier , summer , averager , differentiator, integrator, differential amplifier , instrumentation amplifier , log and antilog amplifier , voltage to current and current to voltage converters , comparators Schmitt trigger , active filters, 555 timer and its application.

References:

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Malvino& Leach; "Digital Principles & Applications"; TMH
3. W.H. Gothman; "Digital Electronics"; PHI.
4. Millman&Taub; "Pulse, Digital & Switching Waveforms"; TMH
5. Jain RP; Modern digital Electronics; TMH
6. R.J. Tocci, "Digital Systems Principles & Applications".
7. MillimanHallkias - Integrated Electronics; TMH Pub.
9. Gayakwad; OP-amp and linear Integrated Circuits; Pearson Education
10. Salivahanan; Electronic devices and circuits; TMH

11. Salivahanan; Linear Integrated Circuits; TMH-
12. MilimanGrabel; Micro electronics , TMH

List of experiment (Expandable)

1. To study and test of operation of all logic gates for various IC's (IC#7400,IC#7403,IC# 7408,IC#74332,IC#7486).
2. Verification of Demorgan's theorem.
3. To construct of half adder and full adder
4. To construct of half subtractor and full subtractor circuits
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Designing and verification of property of full adder.
9. Design a Multiplexer/ Demultiplexer

8. Diode and Transistor characteristics
9. Transistor Applications (Amplifier and switching)
10. OP-Amp and its Applications
11. 555 timer and its Applications

CS-304 Artificial Intelligence & Machine Learning

UNIT I: Meaning and definition of AI, various types of production system, study and compression of BFS and DFS techniques, other search techniques like hill climbing, A*, AO* algorithm.
Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning. Learning Problems Perspectives and Issues Concept Learning Version Spaces and Candidate e Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

UNIT II: Knowledge representation, problem in representing knowledge representation using propositional and predicate logic , comparison of prepositional and predicate logic, Resolution refutation deduction theorem proving, inferencing, monotonic and non-monotonic reasoning.

UNIT III:
Software for Machine Learning and Linear Algebra Overview: Plotting of Data, Vectorization, Matrices and Vectors: Addition, Multiplication, Transpose and Inverse using available tool such as Python. Linear Regression: Prediction using Linear Regression, Gradient Descent, Linear Regression withon   variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling/Selection.
.
UNIT IV: Baye's theorem, semantic networks, scripts scheme, frames, conceptual dependency, fuzzy logic, forward and backward reasoning. Introduction to understanding and natural languages processing.

UNIT V: INSTANT BASED LEARNING: K- Nearest Neighbor Learning Locally weighted Regression Radial Bases Functions – Case Based Learning.

TEXT BOOK:
1. Tom M. Mitchell, "Machine Learning", McGraw-Hill, 2010
2. Bishop, Christopher. Neural Networks for Pattern Recognition. New York, NY: Oxford University
Press, 1995
3. Rich E and Knight K - Artificial Intelligence, TMH, New Delhi.

List of Experiments (expandable):

1. Study of PROLOG programming language and its functions.
2. Write a simple fact for the statement using prolog.
3. Write a program to solve water jug problem using LISP.
4. Write a program to implement Hill climbing Algorithm.
5. Understand the implementation procedures for the machine learning algorithms.
6. Design Java/Python programs for various Learning algorithms.
7. Apply appropriate data sets to the Machine Learning algorithms.
8. Identify and apply Machine Learning algorithms to solve real world problems.

CS-305 Data Structures

Unit I
Introduction: Basic Terminology, Data types and its classification, Algorithm complexity notations like big Oh, Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices, Storage pools, Garbage collection. Recursion-definition and processes, simulating recursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion. Tower of Hanoi Problem.

UNIT II
Stack, Array Implementation of stack, Linked Representation of Stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions and Expression evaluation, Queue, Array and linked implementation of queues, Circular queues, D-queues and Priority Queues. Linked list, Implementation of Singly Linked List, Two-way Header List, Doubly linked list, Linked List in Array. Generalized linked list, Application: Garbage collection and compaction, Polynomial Arithmetic.

UNIT III
Trees: Basic terminology, Binary Trees, , algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary Search Tree (BST), AVL Trees, B-trees. Application: Algebraic Expression, Huffman coding Algorithm.

UNIT IV
Internal and External sorting ,Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort, Searching & Hashing: Sequential search, binary search, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation. Symbol Table, Static tree table, Dynamic Tree table.

Unit V
Graphs: Introduction, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

Reference:
1. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002
2. ISRD Group; Data structures using C; TMH
3. Lipschutz; Data structure (Schaum); TMH
4. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., N Delhi. A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.
5. Data Structures Trembley and Sorenson, TMH Publications
6. Pai; Data structure and algorithm; TMH
7. Introduction to Algorithm- Corman, AWL

List of Experiments (expandable):
Programs in C relating to different theory units.

CS-401 Mathematics

UNIT– I
Function of Complex Variables : Analytic Function, harmanic conjugate, cauahy-Riemen equation, line integral, Cauchy's theorem. Cauchy's integral formula, singular points, Poles & residues. Residuce theorem, evaluation of real integral, Bilinear transformation

Numerical Analysis : Different operators, Error and Approximation, interpolations, Inverse interpolations, Method of least squares, Numericals differentiation, Newton Raphson. Method of solving polynomials.

UNIT – III

Solutions of algebraic and transcendental equations, Solutions of simultaneous algebraic equations, Solutions of ordinary differential equation & partial differential equations

UNIT – IV

Linear Algebra: Simultaneous linear equation Matrices, vector space & subspaces, Bases & dimensions, Linear transformation &their matrix representations, change of basis.

UNIT –V

Eigen values & Eigen vectors, cayley-Hamilton theorem, Diagonalizable operators Quadratic forms & their diagonalisation, Bilinear forms, Hermitian forms, definite and semi definite forms.

BOOKS:
1.   B.S. Grewal – Numerical Methods
2.   D.S.Chandra sehkaraiah – Engineering Maths parts II &III (Prism books pvt.)
3.   E.K. Kveyszing – Advanced Engineering Mathematics
4.   Ralph. J. Stanton – Numerical Analysis

CS-402 Computer System Organization

Unit I
Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085microprocessor organization

Unit-II
Control Unit Organization: Hardwired control unit, Micro and nano programmed controlunit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Unit-III
Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor,8085 I/O structure, 8085 instruction set and basic programming. Data transfer – Serial /parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

Unit-IV
Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

Unit V
Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

References:
1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. J P Hayes, Computer Architecture and Organisations, Mc- Graw Hills, New Delhi
4. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer Organization; TMH
7. Carter; Computer Architecture (Schaum); TMH
8. Carl Hamacher: Computer Organization, TMH

CS-403 Object Oriented Technology

Unit I
Abstract data types, Objects and classes, Attributes and Methods, Objects as software units, Encapsulation and Information hiding, Objects instantiations and interactions, Object lifetime, Static
and dynamic objects, global and local objects, Meta class, Modeling the real world objects.

Unit II
Relationships between classes, Association of objects, Types of Association, Recursive Association, Multiplicities, Navigability, Named association, Aggregation of objects. Types of Aggregation, Delegation, Modeling Association and Aggregation.

Unit III
Inheritance and Polymorphism, Types of polymorphism, Static and dynamic polymorphism, Operator and Method overloading, Inherited methods, Redefined methods, the protected interface, Abstract methods and classes, Public and protected properties, Private operations, Disinheritance, Multiple inheritance.

Unit IV
Container Classes, Container types, typical functions and iterator methods, Heterogeneous containers, Persistent objects, stream, and files, Object oriented programming languages,

Unit V
Study of C++/Java as Object-oriented programming language.

References:
1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore: Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Java Complete Reference: Herbert Schildt, McGraw Hill
5. Hubbard; Programming in C++ (Schaum); TMH
6. Mastering C++ by Venugopal, TMH

List of experiments (Expandable):
Programming assignments may be given to students so that they can better understand the concepts of object oriented programming such as objects, classes, class-relationships, association,
aggregation, inheritance, polymorphism etc.

CS-404 Analysis & Design of Algorithm

Unit I

Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, strassen's matrix multiplication.

Unit II

Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm

Unit III

Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm

Unit IV

Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.

Unit V

Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniquesfor trees and graphs (In order, preorder, postorder, DFS, BFS), NP-completeness.

References:1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. Michael T Goodrich, Robarto Tamassia, Algorithm Design, Wiely India

List of Experiments (expandable):
1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for optimal merge patterns.
6. Write a program for Huffman coding.
7. Write a program for minimum spanning trees using Kruskal's algorithm.
8. Write a program for minimum spanning trees using Prim's algorithm.

9. Write a program for single sources shortest path algorithm.
10. Write a program for Floye-Warshal algorithm.
11. Write a program for traveling salesman problem.
12. Write a program for Hamiltonian cycle problem.

CS-405 Analog Digital Communication

Unit-I

Time domain and frequency domain representation of signal, Fourier Transform and its properties, Transform of Gate, Periodic gate, Impulse periodic impulse sine and cosine wave, Concept of energy density and power density (Parseval's theorem), Power density of periodic gate and impulse function, impulse response of a system, convolutions, convolution with impulse function, causal and non causal system impulse response of ideal low pass filter, Correlation & Auto correlation.

Unit-II

Base band signal, need of modulation, Introduction of modulations techniques, Amplitude modulation Equation and its frequency domain representation, Bandwidth, Power distribution. AM suppressed carrier waveform equation and frequency domain representation Generation (Balance/Chopper modulator) and synchronous detection technique, errors in synchronous detection, Introduction to SSB and VSB Transmission Angle modulation, Frequency and phase modulation equation and their relative phase and frequency deviations, modulation index frequency spectrum, NBFM and WBFM, Bandwidth comparison of modulation techniques.

Unit-III

Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation (PAM), Time division, multiplexing (TDM). Channel Bandwidth for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digital signal, Quantization, Quantization error, Pulse code modulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM (DPCM), Delta Modulation (DM) and Adaptive Delta Modulation (ADM), comparison
of various systems.

Unit-IV

Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude shift keying (ASK) Binary Phase Shift keying (BPSK), Differential phase shift keying (DPSK), offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM), MODEM, Introduction to probability of error.

Unit-V

Information theory and coding- Information, entropies (Marginal and conditional), Model of a communication system, Mathematical representation of source, channel and receiver characteristics, Mutual information, channel capacity efficiency of noise free channel Binary symmetric channel (BSC) Binary erasure channel (BEC), Repetition of signal, NM symmetric Binary channel, Shannon theorem, Shanon- Hartley theorem (S/N-BW trade off)Source encoding code properties; Shanon, Fano and Huffman coding methods and their efficiency error control coding, Minimum Hamming distance, Linear Block Code, Cyclic code and convolution codes. Line Encoding: Manchester coding, RZ, NRZ coding.

References:
1. Singh &Sapre, Communication System, TMH
2. Taub& shilling, Communication System, TMH
3. Hsu; Analog and digital communication(Schaum); TMH
4. B.P. Lathi, Modern Digital and analog communication system,
5. Simon Haykins, Communication System. John Willy
6. Wayne Tomasi, Electronic Communication system.
7. Martin S. Roden, Analog & Digital Communication System; Discovery Press.
8. Frank R. Dungan, Electronic Communication System, Thomson/Vikas.

CS-406 Computer Programming(.Net Technologies)

UNIT I
Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II
Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. **Advanced Features Of C#** Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III
Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. **Windows Forms:** All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV
Understanding and handling controls events, **ADO.NET-** Component object model, ODBC,OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader **Data base controls:** Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V
XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:
1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. **Web** Commerce **Technology** Handbook by Daniel **Minoli**, Emma **Minoli**, TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Expandable):

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.

CS-501 Data Communication

UNIT :- I

Introduction to data communication: Components , data representation ,data flow and basic model ,data representation ,Serial & Parallel transmission , Modes of data transmission, Encoding: Unipolar, Polar ,Bipolar line & block codes ,Data compression Frequency dependant codes, Run length encoding ,Relative encoding ,LZ Compression ,Image and multimedia compression. Review of analog & digital transmission methods, Nyquist Theorem .

UNIT:-II

Multiplexing: FDM, TDM, WDM, Synchronous & Statistical TDM, North American digital multiplexing hierarchy, European TDM, Spread spectrum: Frequency Hopping & Direct Sequence spread spectrum. Terminal handling & polling. Switched Communication Networks: Circuit, Message, Packet & Hybrid Switching, Soft switch Architecture with their comparative study, X.25, ISDN.

UNIT:-III

Physical Layer: Introduction, Interface, Standards, EIA-232-D, RJ-45, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration, X.21 Modem: Types, features, signal constellation, block schematic, limited distance, dial up, baseband, line driver, Group Band and Null modems etc., ITU-T V-series modem standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Study of various types of topology and their comparative study and introduction to queing theory.

UNIT:-IV

Transmission Media: Transmission line characteristics, distortions, Crosstalk, Guided Media: Twisted Pair, Baseband & Broadband Coaxial. Optical Fibre: Physics and velocity of propagationof light , Advantages & Disadvantages ,Block diagram ,Nodes and classification ,Comparison, losses , light source and detectors , Construction, Unguided media : Electromagnetic polarization ,Rays and waves front ,electromagnetic spectrum and radiation, spherical wave front and inverse square law , wave attenuation and absorption, optical properties of Radio waves , Terrestrial Propagation of electromagnetic waves , skip distance , free - space path loss, Radio waves , Microwave , Infrared & Satellite Communication system . Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL, HDSL, SDSL, VDSL, Cable TV network for data transfer.

UNIT:-V

Transmission Errors : Content Error , flow integrity error , methods of error control ,Error detection ,Error correction ,Bit error rate , Error detection methods: Parity checking ,Checksum Error Detection ,Cyclic Redudancy Check ,Hamming code , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .

Suggested Reading:

1. Gupta Prakash C.,"Data communication", PHI Learning
2. Tomasi,"Introduction to Data Communication & Networking, Pearson Education
3. Forouzan, "Data communication", TATA McGraw
4. Godbole,"Data Communication & Network" , TMH
5. Miller,"Data Network and Comunication", Cengage Delmar Learning
6. William Stallings ,"Data & Computer Communication", Pearson Education
7. A.S Tanenbum,"Computer Network", Pearson Education.

CS-502 Operating System

Unit I

Introduction to System Programs & Operating Systems, Evolution of Operating System (mainframe, desktop, multiprocessor, Distributed, Network Operating System, Clustered & Handheld System), Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling. Types of Operating System: Bare machine, Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system.

Unit II

File: concepts, access methods, free space managements, allocation methods, directory systems, protection, organization ,sharing & implementation issues, Disk & Drum Scheduling, I/0 devices organization, I/0 devices organization, I/0 buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations. Device Driver: Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine. File system in Linux & Windows

Unit III

Process: Concept, Process Control Blocks (PCB), Scheduling criteria Preemptive & non Preemptive process scheduling, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling, operations on processes, threads, inter process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock: Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

Unit IV

Memory Hierarchy, Concepts of memory management, MFT & MVT, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation. Structure & implementation of Page table. Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms,allocation of frames, thrashing, demand segmentation.

Unit V

Distributed operating system:-Types, Design issues, File system, Remote file access, RPC, RMI, Distributed Shared Memory(DSM), Basic Concept of Parallel Processing & Concurrent Programming Security & threats protection: Security violation through Parameter, Computer Worms & Virus, Security Design Principle, Authentications, Protection Mechanism Introduction to Sensor network and parallel operating system. Case study of Unix, Linux &Windows,

Suggested Reading:

1. Silberschatz ,"Operating system", Willey Pub.
2. Stuart,"Operating System Principles, Design & Applications", Cengage Learning
3. Tannanbaum, "Modern operating system", PHI Learning
4. Dhamdhere, "Operating System", TMH.
5. Achyut S Godbole, "Operating System", TMH.
6. William stalling, "operating system" Pearson Edu.
7. Deitel&Deitel, "Operating Systems", Pearson Edu.
8. Flynn & Mchoes, "Operating Systems", Cengage Learning
9. Haldar, "Operating System", Pearson Edu

CS-503 Data Base Management System

Unit I

DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages, of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer, ER data model: Entitles and attributes, Entity types, Defining the E-R diagram, Concept of Generalization, Aggregation and Specialization. Transforming ER diagram into the tables. Various other data models object oriented data Model, Network data model, and Relational data model, Comparison between the three types of models.

Unit II

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity, Intension and Extension, Relational Query languages: SQL- DDL, DML, integrity constraints, Complex queries, various joins, indexing, triggers, ssertions, Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

Unit III

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multivalued dependencies. Query Optimization: Introduction, steps of optimization, various algorithms to implement select, project and join operations of relational algebra, optimization methods: heuristic based, cost estimation based.

Unit IV

Transaction Processing Concepts: - Transaction System, Testing of Serilizability, Serializabilityof schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling. 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 transaction. Introduction to Distributed databases, datamining, dataware housing, Object Technology and DBMS, Comparative study of OODBMS vs DBMS . Temporal, Deductive, Multimedia, Web &Mobile database.

Unit V

Study of Relational Database Management Systems through Oracle/Postgres SQL/MySQL: Architecture, physical files, memory structures, background process. Concept of table spaces, segments, extents and block. Dedicated server, multi threaded server. Distributed database, database links, and snapshot. Data dictionary, dynamic performance view. Security, role management, privilege management, profiles, invoker defined security model. SQL queries, Data extraction from single, multiple tables equi-join, non equi-join, self-join, outer join. Usage of like, any, all, exists, in Special operators. Hierarchical queries, inline queries, flashback queries. Introduction of ANSI SQL, anonymous block, nested anonymous block, branching and looping constructs in ANSI SQL. Cursor management: nested and parameterized cursors, Oracle exception handling mechanism. Stored procedures, in, out, in out type parameters, usage of

parameters in procedures. Userdefined functions their limitations. Triggers, mutating errors, instead of triggers.

Suggested list of experiments: -
Lab Assignments:
1. Delete duplicate row from the table.
2. Display the alternate row from table.
3. Delete alternate row from table.
4. Update multiple rows in using single update statement.
5. Find the third highest paid and third lowest paid salary.
6. Display the 3rd, 4th, 9th rows from table.
7. Display the ename, which is start with j, k, l or m.
8. Show all employees who were hired the first half of the month.
9. Display the three record in the first row and two records in the second row and onerecord in the third row in a single sql statements.
10. Write a sql statements for rollback commit and save points.
11. Write a pl/sql for select, insert, update and delete statements.
12. Write a pl/sql block to delete a record. If delete operation is successful return 1 elsereturn 0.
13. Display name, hire date of all employees using cursors.
14. Display details of first 5 highly paid employees using cursors.
15. Write a database trigger which fires if you try to insert, update, or delete after 7'o' clock.
16. Write a data base trigger, which acts just like primary key and does not allow duplicatevalues.
17. Create a data base trigger, which performs the action of the on delete cascade.
18. Write a data base trigger, which should not delete from emp table if the day is Sunday.
19. In this subject the students are supposed to prepare a small database application incomplete semester like financial accounting system, Railway reservation system,institute timetable management system. Student record system, library management system, hospital management system etc. **in RDBMS** as follows:

Section A:
Solving the case studies using ER data model (design of the database)
Section B:
Implement a miniproject for the problem taken in section A.

Suggested Reading:-
1. Date C J, "An Introduction To Database System", Pearson Educations
2. Korth, Silbertz,Sudarshan, "Fundamental of Database System", McGraw Hill
3. Rob, " Data Base System:Design Implementation & Management", CengageLearninig
4. Elmasri, Navathe, "Fundamentals Of Database Systems", Pearson Educations
5 .AtulKahate , " Introduction to Database Management System", Pearson Educations
6. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press,TMH.
7. Paneerselvam,"DataBase Management System", PHI Learning
8. dev.mysql.com 9. www.postgressql.org

CS-504 Computer Graphics & Multimedia

Unit-I

Introduction to raster scan displays, Pixels, frame buffer, Vector & Character generation, random scan systems, Graphics Primitives, Display devices, Display file structure, Scan Conversion techniques, line drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms. Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

Unit-II

2D transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping, Cohen Sutherland, Midpoint Line clipping algorithms, Polygon Clipping: Sutherland –Hodgeman, Weiler-Atherton algorithms.

Unit-III

3D transformations: translation, rotation, scaling. Parallel & Perspective Projection, Types of Parallel & Perspective Projection. Hidden Surface elimination: Depth comparison, Back face detection algorithm, Painters algorithm, Z-buffer algorithm. Curve generation, Bezier and B-spline methods.

Unit-IV

Basic Illumination Model, Diffuse reflection, Specular reflection, Phong Shadin Gourand shading,ray tracing, color models like RGB, YIQ, CMY, HSV.

Unit –V

Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards. i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG, Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP, MOV, MPEG, compression standards, compression through spatial and temporal redundancy. Multimedia Authoring **.**

LIST OF PRACTICAL
1. A BRIEF STUDY OF VARIOUS TYPES OF INPUT AND OUTPUT DEVICES.
2. PROGRAM TO IMPLEMENT A LINE USING SLOPE INTERCEPT FORMULA.
3. PROGRAM TO IMPLEMENT LINE USING DDA ALGORITHM.
4 .PROGRAM TO IMPLEMENT LINE USING BRESENHAM'S ALGORITHM.
5. PROGRAM TO IMPLEMENT CIRCLE USING MID POINT ALGORITHM.
6. PROGRAM TO IMPLEMENT TRANSLATION OF A LINE AND TRIANGLE
7. PROGRAM TO IMPLEMENT ROTATION OF A LINE AND TRIANGLE
8. PROGRAM TO IMPLEMENT SCALING TRANSFORMATION.
9. PROGRAM TO IMPLEMENT 3D ROTATION ABOUT AN ARBITRARY AXIS .
10. PROGRAM TO IMPLEMENT COHEN SUTHERLAND LINE CLIPPING .
11. PROGRAM TO IMPLEMENT SUTHERLAND HODGMAN POLYGON CLIPPING .
12. PROGRAM TO DRAW BEZIER CURVE.
13. PROGRAM TO DRAW B-SPLINE CURVE.

Suggested Reading:

1. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
2. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
3. FolayVandam, Feiner, Hughes "Computer Graphics Principle & Practice" , Pearson Pub.
4. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
5. Parekh "Principles of Multimedia" Tata McGraw Hill
6. Prabhat k Andleigh, KiranThakral , "Multimedia System Design " PHI Pub.
7. Shuman "Multimedia in Action", Cengage Learning.

CS-505 Theory of Computation

UNIT I:
Automata:
Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

Regular Sets and Regular Grammars:
Alphabet, words, Operations, Regular sets, Finite automata and regular expression, Myhill-Nerode theorem Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

UNIT II:
Context –Free Grammars:
Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

UNIT III:
Pushdown Automata:
Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA.

Context Free Languages:
The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT IV:
Turing Machines:
Introduction, TM model, representation and languages acceptability of TM Design of TM, Universal TM & Other modification, Church's hypothesis, composite & iterated TM. Turing machine as enumerators. Properties of recursive & recursively enumerable languages, Universal Turing machine

UNIT V:
Tractable and Untractable Problems:
P, NP, NP complete and NP hard problems, examples of these problems like satisfy ability problems, vertex cover problem, Hamiltonian path problem, traveling sales man problem, Partition problem etc.

Suggested Reading:

1. 1.John E. Hopcroft, Jeffery Ullman, "Introduction to Automata theory, Langauges & computation" , Narosa Publishers.
2. K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHI Learning
3. Michael Sipsev,"Theory of Computation",Cenage Learning
4. John C Martin, "Introdution to languages and theory of computation", McGraw Hill
5. Daniel I.A. Cohen,"Introduction to Computer Theory", Wiley India.
6. Kohavi,"Switching & Finite Automata Theory", TMH

CS-506 Computer Programming V

(Unix/Linux Lab)

Overview of Unix/Linux: -
Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux, Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions, The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script. Use of Linux as web-server, file server, directory server, application server, DNS server, SMTP server, Firewall, Proxy server.

File System: -
Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

Process Control: -
Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling Priorities, Changing the Priority of a time-sharing process, Killing Process.

System Security: -
Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

Dynamic Host Configuration Protocol: -
Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types, Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

Case Study: -
Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE, TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxy Server

List of Experiments:-
1. To Study basic & User status Unix/Linux Commands.
2. Study & use of commands for performing arithmetic operations with Unix/Linux.
3. Create a file called wlcc.txt with some lines and display how many lines, words and characters are present in that file.
4. Append ten more simple lines to the wlcc.txt file created above and split the appended file into 3 parts. What will be the names of these split files? Display the contents of each of these files. How many lines will be there on the last file?
5. Given two files each of which contains names of students. Create a program to display only those names that are found on both the files.
6. Create a program to find out the inode number of any desired file.
7. Study & use of the Command for changing file permissions.
8. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called usere.ux.
9. Execute shell commands through vi editor.
10. Installation, Configuration & Customizations of Unix/Linux.
11. Write a shell script that accepts any number of arguments and prints them in the reverse order.
12. Write a shell script to find the smallest of three numbers that are read from the keyboard.
13. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates if the specified user does not login during a specified period of time.
14. Installation of SAMBA, APACHE, TOMCAT.
15. Implementation of DNS, LDAP services,
16. Study & installation of Firewall & Proxy server

Suggested Reading:
1. Venkatesh Murthy, "Introduction to Unix &Shell", Pearson Edu
2. Forouzan, "Unix &Shell Programming", Cengage Learning
3. Sumitab Das,"Unix Concept &Application", TMH
4. Gopalan, Shivaselvan, "Beginners Guide to Unix " PHI Learning
5. Venkateshwavle, "Linux Programming Tools Unveiled", BS Publication.
6. Richard Peterson, "Linux Complete Reference", TMH
7. Richard Peterson, "Unix Complete Reference", TMH

CS-601 Micro Processor and Interfacing

UNIT –I

Evolution of microprocessor, single chip micro computers, Micro processor Application, Microprocessor and its architecture, addressing modes, instruction, Instruction sets, Arithmetic and Logic Instruction, Program control instruction, Introduction – 8086 family, procedure and macros, connection , Timing and Trouble shooting interrupt, 80286,80836 and 80486 micro processor system concept.

UNIT – II

Microprocessor Cycle, AIU, Timing and control Unit, Register data, Address bus, Pin Configuration, Intel 8086 instruction, Opcode and operands, limitation word size. Programming the microprocessor Assembly language, The Pentium and Pentium ProMicro Processor with features, Pentium II, Pentium III and Pentium – IV Microprocessor with software changes. Instruction set for Intel 8086, Introduction Intimation and data formats, Addressing modes, Status flags, Symbols and abbreviations, programming of microprocessors, Assembly language, high level language, areas of application of various languages, Stacks, Sub routines system, software, commands in assembly language, software Development, Debugging program, Modular programming, Structured programming, Top-down, Bottom- up design , MACRO microprogramming

UNIT-III

Assembly language programming with Examples like Addition of 8/16-bit Binary number, subtraction of 8/16 bit binary number, Address partitioning, addressing mode, type of addressing mode, memory and I/o interfacing, Data transfer schemes, Interfacing device and I/o devices I/o ports, Basic I/o Interfacing MDS, Micro controllers, I/o processor and co- processors ,Microcomputer Development system, Single chip micro computers, intel 8748 intel 8051, inter 8096, intel 8049intel 2920/2921, I/oprocessor UPI-425,UPI-41,42, Co-processor, math processor math co-processor –8087, 80287, 80387DX 803875x.

UNIT –IV

Bus Interface I/o port Addressing, decoding 8279, Programmable key board/display interface, 8254 Internal Timer, 16550 programmable communication interface A/D,8259A Programmable Interrupt Controller, 8237 DMA Controller, Shared bus operation, disk Memory system Video display. ISA Bus, Extended ISA (EISA) and VESA Local Buses, Peripheral Component Inter Connect (Pc I) Bus, Parallel Printer interface (LPT)Universal serial Bus (USB) Accelerated graphics port (AGP), Programmable Communication interfere 8251 VSART CRT Controller 8275, 6854, Floppy disk Controller 8272, I/o processor 8089.

UNIT – V

Memory Unit, RAM,SRAM, DRAM,ROM, PROM EPROM, EEPROM Nonvolatile RAMsemiconductor Technology for memory, Shift register, Magnetic Memory, Tap, disc,main memory and secondary memory cache memory, program memory and DataMemory, Real and virtual memory Buses, memory Addressing capacity of CPU,processing speed of computer.

List of Experiments

1. Add a data byte located at offset 0500H in 2000H segment to another data byte available at 06000H in same segment and store the resulting 0700H in same segment?

2. Add the contents of memory location 2000H, offset 0500H to the contained of accumulator.

3. Write a program to find the average to two temperature name HI-TEMP and LOTEMP and puts the result in the memory location AV-TEMP.

4. Find out the largest number from an unordered array of sixteen 8-bit numbers stored sequentially in the memory locations starting at offset 0500H in the segment 2000H

5. Move a byte string, 16 bytes long, from the offset 0200H to 0300H in the segment7000H.

6. Write a program to add a profit factor to each element in a cost array and puts the result in a PRICES array, where profit factor is 15H and COST =20H, 28H, 15H, 26H,19H, 27H, 16H, 29H.

7. Write a program to find out the number of positive numbers and negative numbers from a given series of signed numbers.

8. Write a program that performs the addition, subtraction, multiplications, division of the given operands. Perform BCD operation for addition and subtraction.

9. A Program to find out the number of even and odd numbers from a given series of 16bit hexad4ecimal numbers.

Suggested Reading:

1. Douglas V Hall, "Microprocessors and interfacing – Programming & Hardware" TMH

2. Barry B. Brey, "The intel Microprocessor – 8086", Pearson Education

3. Kenneth J.Ayala,"The 8086 Microproccessor: Programming & Interfacing The PC",Cengage Learning

4. Krishna Kant,"Microprocessors and Microcontrollers", PHI Learning

5. A.K.Ray KM Bhurchandi, "Advanced Microprocessor and peripherals" McGraw Hill

6. R.S. Gaonkar ,"Microprocessors and interfacing", TMH

CS - 602Principles of Programming Languages

UNIT-I
Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT-II
Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names ,Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

UNIT-III
Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic subprograms, design issues for functions overloaded operators, co routines.

UNIT-IV
Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection, object oriented programming in small talk, C++, Java, C#, PHP, Perl . Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT – V
Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

Suggested Reading:

1. Sebesta,"Concept of programming Language", Pearson Edu.
2. Louden, "Programming Languages: Principles & Practices" ,Cengage Learning
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw –Hill
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.
5 CavloGhezzi& Mehdi Jazayeri" Programming Languages Concepts", Willey India
6 E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley

CS-603 Software Engineering & Project Managements

Unit I: The Software Product and Software Process:
Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

Unit II: Requirement Elicitation, Analysis, and Specification
Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

Unit III: Software Design
The Software Design Process, Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics

Unit IV: Software Analysis and Testing
Software Static and Dynamic analysis, Code inspections, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized Testing, Test Plan, Test Metrics, Testing Tools. , Introduction to Object-oriented analysis, design and comparison with structured software engg.

Unit V: Software Maintenance & Software Project Measurement
Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasilibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance(SQA). Project Plan, Project Metrics.

Practical and Lab work
Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, Net Beans, and Visual Studio can be used.

INSTITUTE OF ENGINEERING ,JIWAJI UNIVERSITY ,GWALIOR
BRANCH : COMPUTER SC.ENGG. (w.e.f.2022-2026 BATCH)

Suggested Reading:

.**1.** Pankaj Jalote ,"An Integrated Approach to Software Engineering", Narosa Pub, 2005

2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning

3. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition2006, McGraw-Hill.

4. Sommerville, "Software Engineering", Pearson Education.

5. Richard H.Thayer, "Software Engineering & Project Managements", Willey India

6. Waman S. Jawadekar, "Software Engineering", TMH

7. Schwalbe, "IT Project Managements", Cengage Learning.

CS-604 Computer Networking
Unit I
Computer Network: Definitions, goals, components, structure, Architecture, Classifications & types, Growth, Complexity and applications etc. Layered Architecture: Protocol hierarchy, Connection Oriented & Connectionless Services, Service primitive Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization. Examples of Networks: Telecommunication Network, Corporate Networks, Connection oriented network i.e., X.25, Frame relay & ATM, Wireless LAN 802.11, internet, Intranet, Extranet, SNA & DNA etc.

Unit II
Data Link Layer: Need, Services Provided, Framing & its methods, Flow Control, Error control. DLL Protocol: Elementary & Sliding Window. Piggybacking & Pipelining. Protocol verification: Finite State Machine Models & Petri net models. Example in Data Link Layers: HDLC & Internet. Comparison of BISYNC and HDLC Features. Bridges and layer-2 switches

Unit III
MAC Sub layer: Static & Dynamic channel allocation, Media access control for LAN &WAN. Classification of MAC Sub layer protocol, Study of various collision, Collision free& limited contention protocol i.e., ALOHA : pure, slotted , CSMA, CSMA/CD,CSMA/CA, Bit Map, Binary count down, BRAP, MLMA, Adaptive tree walk & urn protocol etc. IEEE802 standards for LAN & MAN & their comparison. Ethernet: Cabling, Binary exponentials algorithms, performance fast Ethernet, Gigabit Ethernet, FDDI. Wireless LANs, Broadband Wireless, Bluetooth: Architecture, Application & Layering.

UNIT – IV
Network Layer: Need, Services Provided , Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing for mobile hosts, Routing in AdHoc Networks Routing Strategies, Congestion Control Algorithms: General Principles of Congestion control, Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram subnets.IP protocol, IP Addresses, Comparative study of IPv4 & IPv6, Mobile IP.

Unit V
Processes to Processes Delivery – Transmission Control Protocol (TCP) – User Datagram Protocol, Data Traffic, Congestion Control and Quality of Service, Techniques to improve QOS, Integrated Services, and Differentiated Services. Network Security: Cryptography, Message Security, Digital Signature, User Authentication, Key Management, Security Protocols in Internet, DNS, SMTP, FTP, HTTP, WWW, Virtual Terminal Protocol, VoIP: Basic IP Telephone System,H.323 Characteristic & Layering, SIP Characteristics, Method & Sessions.

List of Experiments
1. To study Communication Guiding system
2. To study various types of connectors.
3. To study of different type of LAN equipments.
4. Study and verification of standard Network topologies i.e. Star, Bus, Ring etc

5. LAN installations and their Configurations.

6. To implement various types of error correcting techniques.

7. To implement various types of framing methods.

8. To implement various types of DLL protocols.

9. To study & configure various types of router & Bridges.

10. To implement various types of routing algorithm.

11. To study of Tool Command Language(TCL).

12. Study and Installation of Standard Network Simulator, N.S-2.

13. Study & Simulation of MAC Protocols like Aloha, CSMA, CSMA/CD and CSMA/CA
using Standard Network Simulator.

14. Study & Simulation of Routing Protocols using Standard Network Simulator.

15. Study & implementations of VoIP Concepts.

16. Implementation & Comparisons of various types of Cryptographic algorithms.

Suggested Reading:

1. Tanenbaum A. S ,"Computer Networks "Pearson Education.

2. Stalling W, "Computer Networks", Pearson Education

3. Douglas E. Comer & M.S Narayanan,"Computer Network & Internet", Pearson
Education

4. Behraj A Forouzan,"Data Communication & Networking", McGraw-Hill.

5. Natalia Olifar& Victor Olifer,"Computer Networks", Willey Pub.

6. Prakash C. Gupta, "Data Comunications and Computer Networks", PHI

7. Bertsekas&Gallager "Data Network" , PHI

8 Gallo,"Computer Communication & Networking Technologies",Cengage Learning.

CS-605 Advance Computer Architecture (ACA)

Unit-I

Flynn's Classification, System Attributes to Performance, Parallel computer models Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks

Unit- II

Instruction set architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization- memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

Unit-III

Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling -score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

Unit-IV

Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector super computer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors

Unit-V

Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

Suggested Reading:

1. Kai Hwang, "Advanced computer architecture", TMH.

2. J.P.Hayes, "computer Architecture and organization"; MGH.

3. V.Rajaranam & C.S.R.Murthy, "Parallel computer"; PHI Learning.

4. Kain,"Advance Computer Architecture: - A System Design Approach", PHI Learning

5. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design"; NarosaPublishing.

6. Hwang and Briggs, "Computer Architecture and Parallel Processing"; MGH.

7. David E. Callav&Jaswinder Pal Singh Marge Kaufmann"Advance ComputerArchitecture", EIS India.

8. Sajjan G. Shiva, Taylar& Francis, "Advance Computer Architecture

CS-701 Compiler Design

Unit-I
Introduction to compiling & Lexical Analysis
Introduction of Compiler, Major data Structure in compiler, BOOT Strapping & Porting, Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, Lexical analysis: Input buffering , Specification & Recognition of Tokens, LEX.

Unit-II
Syntax Analysis &Syntax Directed Translation
Syntax analysis: CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR, LALR, LR), Parser generation. Syntax directed definitions: Construction of Syntax trees, Bottom up evaluation of S-attributed definition, L-attribute definition, Top down translation, Bottom Up evaluation of inherited attributes Recursive Evaluation, Analysis of Syntax directed definition.

Unit-III
Type Checking & Run Time Environment
Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation , Symbol table

Unit –IV
Code Generation
Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation: Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code from DAG.

Unit –V
Code Optimization
Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations , Data flow analysis of structure flow graph Symbolic debugging of optimized code.

List of Experiments:
☐ Develop a lexical analyzer to recognize a few patterns.
☐ Write a programme to parse using Brute force technique of Top down parsing.
☐ Develop LL (1) parser (Construct parse table also).
☐ Develop an operator precedence parser (Construct parse table also)
☐ Develop a recursive descent parser
☐ Write a program for generating for various intermediate code forms
i) Three address code ii) Polish notation
☐ Write a program to simulate Heap storage allocation strategy
☐ Generate Lexical analyzer using LEX
☐ Generate YACC specification for a few syntactic categories.
☐ Given any intermediate code form implement code optimization techniques
☐ Study of an Object Oriented Compiler.

References:
1. A. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and
Tools , Pearson Education
2 Raghavan, Compiler Design, TMH Pub.
3. Louden. Compiler Construction: Principles and Practice, Cengage Learning
4. A. C. Holub. Compiler Design in C , Prentice-Hall Inc., 1993.
5. Mak, writing compiler & Interpreters, Willey Pub.

CS-702 Distributed System

Unit-I
Introduction to distributed systems
Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System,

Unit-II
Distributed Share Memory and Distributed File System
Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues In DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance. Naming: - Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

Unit-III
Inter Process Communication and Synchronization
API for Internet Protocol, data Representation & Marshaling, Group Communication, Client Server Communication, RPC- Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms:- Bully & Ring Algorithms**.**

Unit-IV
Distributed Scheduling And Deadlock
Distributed Scheduling-Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms,

Unit-V
Distributed Multimedia & Database system
Distributed Data Base Management System (DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System:- Amoeba, Mach, Chorus

References:
□ Sinha, Distributed Operating System Concept & Design, PHI
□ Coulouris&Dollimore, Distributed System Concepts and Design, Pearson Pub
□ Singhal&Shivratari, Advance Concept in Operating System, McGraw Hill
□ Attiya& Welch, Distributed Computing, Wiley Pub.

CS 703 Cloud Computing

UNIT I
Introduction: Historical development , Vision of Cloud Computing, Characteristics of cloud computing   as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

UNIT II
Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

UNIT III
Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce , Cloud Governance, High Availability and Disaster Recovery.
Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits

UNIT IV
Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT V
Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition ,Cloud Federation Stack , Third Party Cloud Services . Case study : Google App Engine, Microsoft Azure , Hadoop , Amazon , Aneka

List of experiment

1. Installation and configuration of Hadoop/ Euceliptus etc.
2. Service deployment & Usage over cloud.
3. Management of cloud resources.
4. Using existing cloud characteristics & Service models.
5. Cloud Security Management.
6. Performance evaluation of services over cloud.

References:

1.Singh&Sapre,Communication System, TMH

2. Taub&shilling,Communication System, TMH

3. Hsu:Analog and digital communication(Schaum): TMH

4.B.P. Lathi,Modern Digital and analog communication system.

5. Simon Haykins,Communication System. John Willy

6. Wayne Tomasi,Electronic Communication system.

7. Martin S. Roden,Analog& Digital Communication System: Discovery Press.

8. Frank R. Dungan,Electronic Communication System, Thomson/Vikas.

CS-704 INFORMATION STORAGE AND MANAGEMENT

Unit-I
Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-II
Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III
Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS,NAS, CAS & SAN.

Unit -IV
Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-V
Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References:

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storageand Management: Storing, Managing, and Protecting Digital Information; Wiley India.

2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; StorageNetwork explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINI BANDand FCOE, Wiley India.

3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Managementand Security, CRC Press, Taylor Frances Pub.

4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.

5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach,TMH Pub.

6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.

7. Sosinsky, Cloud Computing Bible, Wiley India.

Elective – II

CS- 705(A) Network Management

Unit-I

Introduction to Network Managements, Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration. Selected Management Strategy.

Unit –II

Management Information Base (MIB), Structure of Management Information, NMSP resentation of the SMI, NMS Meter-ware Network View. Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents. Setting up LAN Access, SNMP Configuration.

Unit-III

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet for mat, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design.

Unit-IV

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP),Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

Unit –V

Internet Control Message Protocols (ICMP):- Types of message, message format, error reporting,query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP

Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package.. Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol(SMTP), X-Window system protocol, Remote procedure call, and Network file system.

References:

□ Forouzan, TCP/IP Protocol Suite 4th edition, TMH
□ J.RichardBurkey, Network Management Concept and Practice, PHI
□ Stevens, TCP/IP Illustrated Volume-I, Pearson
□ Tittel: TCP/IP, Cenage Learning
□ Uyless Black, TCP/IP and related protocols, McGraw Hill.
□ Doughals E. Comer, Internetworking with TCP/IP Vol. I, Principles, Protocols, and
Architecture, Prentice Hall, India.

Elective – II

CSE-705(B) Data Mining & Knowledge Discovery

Unit-I

Introduction, to Data warehousing, needs for developing data Warehouse, Data warehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts:-Dependent Data Marts, Independents Data Marts & Distributed Data Marts, Conceptual Modeling of Data Warehouses:-Star Schema, Snowflake Schema, Fact Constellations. Multidimensional Data Model & Aggregates.

Unit-II

OLAP, Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP & OLTP, OLAP Servers:-ROLAP, MOLAP, HOLAP Queries.

UNIT-III

Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data Mining System categorization and its Issues. Data Processing :- Data Cleaning, Data Integration and Transformation. Data Reduction, Data Mining Statistics. Guidelines for Successful Data Mining.

Unit-IV

Association Rule Mining:-Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori-Tid, Direct Hasing and Pruning(DHP),Dynamic Itemset Counting (DIC), Mining Frequent Patterns without Candidate Generation(FP-Growth),Performance Evaluation of Algorithms,.

Unit-V

Classification:-Introduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Based on Information Theory, Split Algorithm Based on the Gini Index, Over fitting and Pruning, Decision Trees Rules, Naïve Bayes Method. Cluster Analysis:- Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods:- Partitional Methods, Hierarchical Methods, Density- Based Methods, Dealing with Large Databases. Quality and Validity of Cluster Analysis Methods.

References:
1. Berson: Data Warehousing & Data Mining &OLAP , TMH
2. Jiawei Han and MichelineKamber, Data Mining Concepts & Techniques, Elsevier Pub.

3. Arun.K.Pujari, Data Mining Techniques, University Press.
4. N.P Gopalan: Data Mining Technique & Trend, PHI
5. Hand, Mannila& Smith: Principle of Data Mining, PHI
6. Tan, Introduction to Data Mining, Pearson Pub.

Elective – II

CS-705(C) Embedded Computer Systems

Unit – I
Introduction to Embedded systems
Embedded Systems Vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Purpose of Embedded systems ,Core of the Embedded system, Memory, Sensors and Actuators, Communication Interface, Embedded firmware, PCB and Passive Components, Characteristics and Quality attributes of a Embedded System .

Unit – II
Design of Embedded Systems with 8bit Microcontrollers-8051
Factors for considering in selecting a Controller ,Designing with 8051 microcontroller Different addressing modes supported by 8051 , Instruction setfor 8051 microcontroller. Fundamental issues in Hardware Software Co-Design , Computational models in Embedded Design .

Unit – III
Embedded Hardware & Firmware Design and Development
Analog &Digital Electronic components, VLSI & Integrated circuit design, Electronic Design Automation tools , PCB layout Design and its fabrication Embedded firmware design approaches , Embedded firmware Development Languages , Programming in Embedded C . Integration and testing of Embedded Hardware and Firmware , Safe & robust Design, Reliability, Faults, errors & Failure, Functional Design, Architecture Design, Prototyping.

Unit -IV
Embedded System Development Environment
Integrated Development Environment (IDE) , Types of files Generated on Cross-Compilation , Disassembler / Decompiler, Simulators, Emulators and Debugging, Boundary Scan.

Unit – V
Embedded Product Development Lifecycle(EDLC) and Trends in Embedded Industry
What is EDLC ,Objectives of EDLC , Different phases of EDLC , EDLC Approaches-Linear or waterfall model , Iterative Model , Prototyping/Evolutionary Model, Spiral Model . Processor trends in Industry , Embedded OS Trends , Development Language trends Open Standards, Frameworks and Alliances , Bottlenecks.

References:
1. Shibu, Introduction to Embedded System:, TMH
2. Barrett ,Embedded Systems :Design and Applications ,Pearson Education
3. Rajkamal, Embeded System, TMH
4. Vahid ,Givargis ,Embedded System Design ,Wiley
5. Balbno, Embedded Micro Computer System Cengage Learning
6. Siewert, Real Time Embeded System & Components, Cengage Learning
7. Peckol, Embeded System, Willey Indi

CS - 801 Soft computing

Unit – I

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial **Intelligence** : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Unit – II

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb;s learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA,

Unit – III

Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Hopfield/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

Unit – IV

Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

Unit – V

Genetic algorithm : Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation

Operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

References :
S, Rajasekaran& G.A. VijayalakshmiPai, Neural Networks, Fuzzy Logic & Genetic
Algorithms, Synthesis & applications, PHI Publication.
S.N. Sivanandam& S.N. Deepa, Principles of Soft Computing, Wiley Publications
Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
Bose, Neural Network fundamental with Graph ,Algo.&Appl, TMH
Kosko: Neural Network & Fuzzy System, PHI Publication

CS- 802 Web Engineering

UNIT I

An Introduction to Web Engineering, History of web Development, Time line, Motivation, Categories of Web Applications, Characteristics of Web Applications. Evolution and Need for Web Engineering, Web Engineering Models, Software Engineering v/s Web Engineering . World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Introduction to Browser and search engines, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines , Miscellaneous Web Browser details, Introduction to Web Servers: Features of web servers, caching, case study-IIS, Apache, Configuring web servers.

UNIT II

Information Architecture: The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Creating Cohesive Websites: Conceptual Overview Website Development, Website Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems Good & bad web design, Process of Web Publishing. Phases of Web Site development, enhancing your web-site, submission of website to search engines Web security issues, security audit of websites, Web effort estimation, Productivity, Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, , Notations Tools. Principles Requirements Engineering Activities , Adapting RE Methods to Web Application.

UNIT III

Technologies for Web Applications: HTML and DHTML, HTML Basic Concepts, Static and dynamic HTML, Structure of HTML documents, HTML Elements, Linking in HTML, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form. Elements. Introduction to CGI PERL, JAVA SCRIPT, PHP, ASP , Cookies Creating and Reading Cookies

UNIT IV

Technologies for Web Applications: Introduction of XML, Validation of XML documents, DTD,

Ways to use XML, XML for data files, HTML Vs XML, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization , Semantic web, Semantic Web Services, Ontology.

UNIT V

E- Commerce, E-commerce Business Models, The Internet and World Wide Web: E-commerce Infrastructure, Building an E-commerce Web Site , Electronic Commerce environment and opportunities. Modes of Electronic Commerce, Approaches to safe Electronic Commerce ,Electronic Cash and Electronic Payment Schemes ,Online Security and Payment Systems, Ecommerce Marketing Concepts, Advertising on the Internet: issues an Technologies,

Ecommerce Marketing Concepts Electronic Publishing issues, approaches, legalities and technologies ,Privacy and Security Topics: Introduction, Web Security , Encryption schemes, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act.

TERM WORK

1. At least ten practical experiments based on above syllabus and a mini project is desirable to be completed by a group of three that cover following tools.
• HTML
• DHTML
•PHP - XML
• Java Script, CGI, PERL
• ASP

Recommended Books:

1. Roger S. Pressman, David Lowe, "Web Engineering", Tata Mcgraw Hill Publication, 2007
2. Achyut S Godbole and AtulKahate, "Web Technologies", Tata McGraw Hill
3. Gopalan N P ,Akilandeswari "Web Technology: A Developer s Perspective" , PHI
4. NEIL GRAY "Web server Programming" WIley
5. CHRIS BATES Web Programming :Building Internet applications Wiley
6. Moller, "An Introduction to XML and Web Technologies" , Pearson Education New Delhi, 2009
7. Beginning XML 4th Edition Hnter, Refter, Fawset Wiley India
8. Internet & World Wide Web How to Pr ogram, Pearson education, 3rd edition, by: H.M.Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology &Design ", Tata McGraw Hill.
10 Ivan Bay Ross, "HTML, DHTML,Javascript,Perl CGI" , BPB

Elective II
CS-8301 MANET & High Speed Networks

Unit – I

Adhoc – Wireless N/WS : Introduction, Cellular vs Adhoc wireless Networks, Applications of Adhoc wireless Networks, Issues in Adhoc wireless N/WS. Heterogeneity in Mobile devices, Wireless Sensor N/WS, traffic Profiles, Types of Adhoc Mobile Communications, Types of Mobile Host movements, Challenges facing Ad hoc mobile N/WS.

Unit –II

Adhoc Wireless Media Access Protocols :- Introduction Synchronous MAC Protocol & asynchronous MAC protocol, Problems in Adhoc channel Access Receiver Initiated MAC protocols, Sender. Initiated MAC Protocol, Existing Adhoc MAC Protocol.

Unit – III

Overview of Adhoc Routing Protocols :- Table Driver Approaches :- DSDV, WRP, CSGR, Source Initiated On demand Approaches : AODV, DSR, TORA, SSR, LAR, PAR, ZRP, RDMAR.

Unit – IV

Communication Performance of Adhoc Networks , Route discovery time, End to End Delay Performance, Communication throughput performance, Packet loss performance, Route reconfiguration time, Energy Conservation & Power life issues.

Unit – V

High Speed Networks Frame relays, Packet Switching Vs frame relay N/WS. Asynchronous transfer node, ATM protocol architecture, ATM Logical Connection, ATM Cells, AAL, High Speed LANS, FAST Ethernet, fiber channel wireless LANS.

References :-
1) Muthukumaran, Intorduction to high Performance Network, TMH
2) CK Toh, Adhoc Mobile Wireless Networks Protocols & Systems, Pearson.Pearson Publication
3) C-Siva Ram Murthy & B S Majo ,Adhoc Wireless Networks, Architectures Protocols Pearson.Pearson Publication
4) High speed N/WS & Internals, Performance & QOS William Stalling., IInd Edition. Pearson Publication
5) Computer System& Network, Bluldell, Cengage Learning

Elective II
CS-8302 Robotics

Unit-I Introduction
Introduction to robotics, Robot Usage, Robot subsystems, Robot Classification, Technology of Robots, Basic Principles in robotics

Unit-II Spatial Descriptions, Transformation and Sensors
Robot Architecture, Descriptions: Positions, Orientations and Frames, Mappings: Changing descriptions from Frame to Frame, Operators: Translations, Rotations, and Transformations, Transform Equations, Coordinate Transformations, Sensor Classification, Internal Sensors, External sensors, Vision system, sensor selection.

Unit-III Kinematics
Link- Connection Description, Forward and Inverse Positional Analysis, Velocity Analysis: Jacobian Matrix, Link Velocities, Acceleration analysis, Statics: Forces and Moment Balance, Recursive Calculation, Equivalent Joint Torques, Force Ellipsoid, Dynamics: Inertia Properties, Dynamics Algorithms.

Unit-IV Control
Control Techniques, Second order Linear systems, Feedback Control, Performance of feedback control systems, Joint controller, Non linear Trajectory Control, State space Representation and control, Stability, Cartesian and force controls

Unit-V Motion Planning and Computer for Robots
Joint space Planning, Cartesian space planning, Position and orientation Trajectories, Point to Point Planning, Continuous path Generation, Computational speed, Hardware requirements, Control considerations, Robot Programming, Hardware architecture. A case study for Autonomous Mobile Robot.

List of References
1.Saha , Introduction to Robotics , TMH Pub.
2.Craig , Introduction to Robotics ,Mechanics and control , Pearson Pub
3.Ghosal , Robotics –Fundamental Concepts and Analysis , Oxford Pub.
4.Niku , Introduction to Robotics:Analysis , System & Applications , PHI
5.Fu , Robotics ,TMH Pub

Elective II
CS–8303DataScienceUsingPython

Unit – I: Introduction Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.

Unit – II: Data Collection and Data Pre-Processing Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.

Unit–III: Exploratory Data Analytics Descriptive Statistics–
Mean,StandardDeviation,SkewnessandKurtosis–BoxPlots–PivotTable–HeatMap–
CorrelationStatistics–ANOVA.

Unit – IV: Model Development Simple and Multiple Regression – Model Evaluation using Visualization –Residual Plot–Distribution Plot– Polynomial Regression and Pipelines–Measures for In-sample Evaluation–Prediction and Decision Making.

Unit – V: Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – UnderFitting and Model Selection – Prediction by using Ridge Regression–Testing Multiple Parameters by using GridSearch.

Suggested Text Books:
1. JojoMoolayil,"SmarterDecisions:TheIntersectionofIoTandDataScience", PACKT, 2016.
2. CathyO'NeilandRachelSchutt,"DoingDataScience",O'Reilly,2015.
3. David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC2013
4. Raj,Pethuru,"HandbookofResearchonCloudInfrastructuresforBigDataAnalytics",IGIGlobal.

Elective III
CS- 8401 Bioinformatics

Unit-I Introduction

Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

Unit-II Bioinformatics Databases & Image Processing

Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, proteinpurification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

Unit-III Sequence Alignment and database searching

Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

Unit-IV Gene Finding and Expression

Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data

Unit-V Proteomics & Problem solving in Bioinformatics

Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences , Strategies and options for similarity search , flowcharts for protein structure prediction .

List of References

1.Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics &Proteomics ,TMHPub
2.Rastogi , Bioinformatics –Concepts , skills & Applications , CBS Pub
3.Bergeron , Bioinformatics computing , PHI
4.Claverie , Bioinformatics , Wiley pub
5.Baxevanis , Bioinformatics , Wiley Pub
6.Stekel ,MicrarrayBioInformatics , Cambridge

Elective III
CS–8402 Digital Image Processing

Unit-I

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

Unit-II

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

Unit-III

Image enhancement, Filtersin spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by Highpass filtering.

Unit-IV

Imageencodingandsegmentation,Encoding:Mapping,Quantizer,Coder.Errorfreecompression,Lossy Compressionschemes.JPEGCompressionstandard.Detectionofdiscontinuation   by   point detection,   Line   detection,   edge   detection,   Edge   linking   and boundarydetection,Localanalysis,GlobalprocessingviaHoughtransformsandgraphtheoretictechniq ues

Unit-V

Mathematical morphology- Binary, Dilation, crosses, Opening and closing, Simple methods ofrepresentation,Signatures,Boundarysegments,Skeletonofaregion,Polynomialapproximation

References:
1. RafaelCGonzalez, RichardE Woods3rdEdition, DigitalImageProcessingPearson.
2. RafaelCGonzalez,RichardEWoods3rdEdition,DigitalImageProcessingusingMatlab-TMH.
3. Sonka,DigitalImageProcessing&ComputerVision,CengageLearning4Jay
araman,DigitalImage Processing,TMH.
5.Pratt,DigitalImageProcessing, WileyIndia
6Annadurai,FundamentalsofDigitalImageProcessing,PearsonEducation.

Elective III

CS 8403 Wireless Networks

UnitI

Introduction of Wireless Networks, Different Generations of Wireless Networks. Characteristicsof the Wireless Medium:RadioPropagation Mechanisms,Path Loss ModellingandSignalCoverage,EffectofMultipathandDoppler,ChannelMeasurementandModelling Techniques.

UnitII

NetworkPlanning:Introduction,WirelessNetworkTopologies,CellularTopology,CellFundamentals ,SignaltoInterferencesRadioCalculations,NetworkPlanningforCDMASystems. Wireless Network Operations**:** Mobility Management, Radio Resources and PowerManagement

Unit III

MultipleDivisionTechniques:FDMA,TDMA,CDMA,OFDM,SDMA.ComparisonofMultiple Division Techniques, Modulation Techniques – AM, FM, FSK, PSK, QPSK, QAM,16QAM Mobile Data Networks: Introduction, Data Oriented CDPD Network, GPRS, EDGE andHighData Rates,SMSinGSM,MobileApplicationProtocols.

UnitIV

Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologiesfor Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY andMACLayer,Wireless ATM,HIPERLAN.

UNITV

IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, AdhocNetworks,Introductionto2.5Gand3G Networks.

References

1. KavehPahlavan,PrashantKrishnamurthy"principlesofWirelessNetworks",PHI.
2. Qing-AnZeng,DharmaPrakashAgrawal"IntroductiontoWirelessandMobileSystems"CENGAGELearning.
3. SumitKasera,NishitNarang,APPriyanka "2.5GMobileNetworks:GPRSandEDGE",TMH
4. Dr. KAMILOFEHER"WirelessDigitalCommunications", PHI
5. JochenSchiller"MobileCommunications",PEARSON

INSTITUTE OF ENGINEERING ,JIWAJI UNIVERSITY ,GWALIOR
BRANCH : COMPUTER SC.ENGG. (w.e.f.2022-2026 BATCH)