SYLLABUS

For

B.TECH COURSE

In

INFORMATION TECHNOLOGY

(w.e.f Session 2010-2011)

DEPARTMENT OF COMPUTER ENGINEERING

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY
FARIDABAD

HAS- 101 PHYSICS –I

B. Tech. I Semester

No. of Credits: 4		Sessional:	40 Marks
L T P Total		Theory:	60 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Part -A

INTERFERENCE

Coherent sources, conditions for sustained interference. Division of Wave-Front - Fresnel's Biprism, Division of Amplitude- Wedge-shaped film, Newton's Rings, Michelson Interferometer, applications (Resolution of closely spaced spectral lines, determination of wavelengths).

DIFFRACTION

Difference between interference and diffraction Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a single slit, Plane transmission diffraction grating, absent spectra, dispersive power, resolving power and Rayleigh criterion of resolution.

Part- B

POLARISATION

Polarised and unpolarised light, Uniaxial crystals double refraction, Nicol prism, quarter and half wave plates, Detection and Production of different types of polarized light, Polarimetry; Optical and specific rotation, Biquartz and Laurent's half shade polarimeter.

LASER

Spontaneous and Stimulated emission, Laser action, characteristics of laser beam-concept of coherence , spatial and temporal coherence , He-Ne and semiconductor lasers (simple ideas), applications

Part -C

FIBRE OPTICS

Propagation of light in optical fibres, numerical aperture, V-number, single and multimode fibres, attenuation, dispersion, applications

DIELECTRICS

Molecular theory, polarization, displacement vector, electric susceptibility, dielectric coefficient, permittivity & various relations between these, Gauss's law in the

presence of a dielectric, Energy stored in a uniform electric field, concept of local molecular fields and Claussius Mossotti relation.

Part-D

SPECIAL THEORY OF RELATIVITY

Michelson's Morley Experiment, Postulates of Special Theory of Relativity, Lorentz transformations, Consequences of LT (length contraction and time dilation), addition of velocities, variation of mass with velocity, mass energy equivalence.

SUPERCONDUCTIVITY

Introduction (Experimental survey), Meissner effect, London equations, Hard and Soft superconductors, Elements of BCS Theory

Text Books :

1. Perspectives of Modern Physics - Arthur Beiser (TMH)
2. Optics - Ajoy Ghatak (TMH)
3. Modern Physics for Engineers – S.P.Taneja (R. Chand)
4. Engineering Physics – SatyaPrakash (Pragati Prakashan)
5. Modern Engineering Physics – A.S.Vasudeva (S. Chand)

Reference Books :

1. Fundamentals of Physics – Resnick & Halliday (Asian Book)
2. Introduction to Electrodynamics – D.J. Griffith (Prentice Hall)

HAS- 103 MATHEMATICS –I

B. Tech. I Semester

No. of Credits: 4	Sessional:	40 Marks
L T P Total	Theory:	60 Marks
4 0 0 4	Total :	100 Marks
	Duration of Exam:	3 Hours

Part-A

MATRICS AND ITS APPLICATIONS

Rank of a matrix, Normal form, Inverse using Gauss-Jordon method, orthogonal transformation, Linear-dependence and Linear- Independence of Vectors, Eigen-Values and its properties, Eigen-vectors, Cayley-Hamilton theorem & its applications.

Part-B

APPLICATIONS OF DERIVATIVES

Taylor's & Maclaurin's Series for one variable, Asymptotes,Curvature,Radius of Curvature for Cartesian, parametric and polar-curves, Radius of curvature at the origin (by using Newton's method, by method of expansion).

PARTIAL DIFFERENTIATION AND ITS APPLICATIONS

Functions of two or more variables ,Partial derivatives of Ist and higher order, Total differential and differentiability, Homogeneous functions Euler's theorem, Derivatives of composite and implicit functions

Jacobians, Taylor's series for functions of two variables ,Maxima-Minima of functions of two variables.Lagrange's Method of undetermined multipliers.

Part-C

DOUBLE AND TRIPLE INTEGRATIONS

Double integral, Change of Order of Integration, Double integral in polar co-ordinates, Applications of double integral to find (i) Area enclosed by plane curves (ii)Volume of solids of revolution, Triple Integal, Change of variables ,Volume of solids, Beta & Gamma functions and relation between them.

INFINITE SERIES

Convergence and divergence of infinite series, Comparison Test , D'Alembert's Ratio Test, Gauss Test, Raabe's test, Logrithmic Test, Cauchy's Root Test, Alternating series, Conditional convergence & absolute convergence.

Text Books:

1. B.S.Grewal,Engg. Mathematics
2. H.C.Taneja ,Engg. Mathematics
3. R.S. Goyal,Engg. Mathematics
4. Babu Ram , Engg. Mathematics

MU- 101 BASICS OF MECHANICAL ENGINEERING

B. Tech. I / II Semester

No. of Credits: 4	Sessional:	40 Marks
L T P Total	Theory:	60 Marks
4 0 0 4	Total :	100 Marks
	Duration of Exam:	3 Hours

UNIT-1-BASIC CONCEPTS OF THERMODYNAMICS

Introduction, States, Work, Heat, Temperature, Zeroth, 1st, 2nd & 3rd law of Thermodynamics, concept of internal energy, enthalpy and entropy, Problems

UNIT-2-PROPERTIES OF STEAM & BOILERS

Formation of Steam at constant pressure,Thermodynamics Properties of Steam, Use of steam tables, Measurement of dryness fraction by throttling calorimeter, problems. Classification of boilers, Comparison of water and fire tube boilers, mounting and accessories with their function, Constructional and operational details of Cochran and Babcock and Wilcox boilers

UNIT-3-REFRIGERATION & AIR CONDITIONING

Introduction to Refrigeration & Air conditioning, units of refrigeration, Coefficient of performance, Difference between a Heat engine refrigerator and heat pump, simple refrigeration vapour compression cycle, Psychometric charts and its use, simple problems on Coefficient of performance

UNIT-4- I.C ENGINES

Introduction, classification, Constructional details and working of 2 stroke & 4 stroke petrol engine & diesel engine, Otto, diesel and dual cycles, simple problems on Otto & diesel cycles.

UNIT-5-SIMPLE LIFTING MACHINES

Definition of machine, velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, Double and Triple start worm and worm wheel, single and double purchase winch crabs, Simple and compound screw jacks, Problems.

UNIT-6-STRESSES AND STRAINS

Introduction, Concept & types of Stresses and Strains, Poisons ratio, stresses and Strains in simple and compound bar under axial loading, Stress– Strain diagrams, Hooks law, Elastic constants & their relationships, Problems.

UNIT-7-MACHINE TOOLS

Introduction to Metal cutting, working Principal, parts and specification of commonly used machine tools in Workshop such as Lathe, shaper, planner, Milling, Drilling and Slotter.

UNIT-8-MANUFACTURING SYSTEMS

Introduction to Manufacturing Systems, Fundamentals of Numerical Control (NC), Advantage of NC systems, Classification of NC and CNC.

Text Books:

1. Elements of Mechanical Engineering- R.K Rajput Laxmi Pub, Delhi.
2. Elements of Mechanical Engineering- D.S Kumar, S.K Kataria and Sons.
3. Engineering Thermodynamics- P.K Nag TMH, New Delhi.
4. Refrigeration & Air conditioning- Arora & Domkundwar, Dhanpat Rai & Co. Pvt. Ltd.
5. Workshop Technology Vol I &II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

Reference Books:

1. Strength of Materials– Popov, Pub. - PHI, New Delhi.
2. Strength of Materials– G.H Ryder, Pub-ELBS.
3. Engineering Thermodynamics- C.P Arora, Pub- TMH, New Delhi.
4. Refrigeration & Air conditioning- C.P Arora, Pub- TMH, New Delhi.
5. Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, - East- West Press.
6. Manufacturing Process & Systems- Oswald, Munoz, John Wiley.
7. Workshop Technology Vol I, II & III- Chapman, WAJ, Edward Arnold.

MGMT- 101 FUNDAMENTALS OF MANAGEMENT

B. Tech. I/ II Semester

No. of Credits: 4		Sessional:	40 Marks
L T P Total		Theory:	60 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Unit I

Concept and significance of Management, Functions of management and their interrelationship, levels of Management and skills required at various levels, Management vs. Administration, Management as art, science or profession.

Unit II

Human Resource Management- Functions of HRM; Source of recruitment and selection process, Training needs and types, Motivation Theories – Maslow's need Hierarchy theory, Mc Gregor's Theory X and Y, Herzberg Theory.

Unit III

Marketing- Evolution of modern marketing concept, Functions of marketing management, Advertisement- Importance, choice of Media and criticism, Marketing mix, Marketing Research Process.

Unit IV

Production Management- Functions and scope of production management, Production Planning and Control- Stages of PPC, Meaning and methods of inventory control, Concept of TQM (In brief)

Unit V

Financial Management- Functions of Financial Management, Sources of finance, Factors effecting Capital Structure of a company.

Unit VI

Case Study (For Assignment Only)

Books

1. Gupta R. S., Sharma B.D., Bhalla N. S., Principle and Practices of Management, Kalyani Publishers
2. Chhabra T. N., Principles and Practices of Management, Dhanpat Rai & Co.
3. Prasad L. M., Principles and Practices of Management, Sultan Chand & Sons
4. Gupta C. B., Management (Theory and Practice), Sultan Chand & Sons

E- 101 ELEMENTS OF ELECTRONICS ENGINEERING

B. Tech. I/ II Semester

No. of Credits: 4		Sessional:	40 Marks
L T P Total		Theory:	60 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Part- A

SEMICONDUCTOR PHYSICS:
Basic concepts**,** Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open-circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region, Ideal diode, terminal characteristics of junction diode.

AMPLIFIERS:
Introduction of different types of amplifiers and their characteristics, Principle of amplification, Frequency response of RC coupled amplifiers, amplifier bandwidth and Concept of Cascaded Amplifiers, Feedback amplifiers, Effect of positive and negative feedback on amplifier gain and bandwidth**.**

Part-B

OSCILLATORS:
Criteria for oscillations, Qualitative analysis of LC, RC and Crystal Oscillators, Study of Wein Bridge Oscillators

OPERATIONAL AMPLIFIERS:
Op-amps, its characteristics and its applications.

POWER SUPPLIES
Introduction and Working of Switched Mode Power Supply (SMPS), Voltage Regulator, Introduction to Inverters and UPS.

Part-C

DIGITAL ELECTRONICS:
Binary, Octal and Hexadecimal number systems and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT), NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits, Introduction to flip-flops (S-R & J-K).

ELECTRONICS INSTRUMENTS:
Role, importance and applications of general-purpose test instruments viz Multimeter Digital & Analog, Cathode Ray Oscilloscope (CRO), Function/Signal Generator.

Part-D

DISPLAYS :
Seven segment display, Fourteen segment display, Dot matrix display

LED DISPLAY :
Introduction, Construction, Advantage of LEDs in electronics display

LCD DISPLAY :
Introduction; Types of LCD display:- Dynamic scattering and field effect type;

TYPES OF LIQUID CRYSTAL CELLS :
Transmitting type and reflective type; Advantage & disadvantage of LCD display common applications.

Books Recommended

1. Sedra A S and Smith K C, "Microelectronic Circuits" 4th Ed., New York, Oxford University Press, New York (1997).
2. Tocci R J and Widmer N S, "Digital Systems – Principles and Applications", 8th Ed., Pearson Education India, New Delhi (2001).
3. Cooper and Helfrick, "Modern Electronic Instrumentation and Measuring Techniques", 4th print Prentice Hall of India, New Delhi (1996).
4. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", 8th Ed, Pearson Education India, New Delhi (2002).
5. Millman and Grabel, "Microelectronics", 2nd Ed. Tata McGraw-Hill (1999).

HAS- 105 CHEMISTRY

B. Tech. I/ II Semester

No. of Credits: 4	Sessional: 40 Marks
L T P Total	Theory: 60 Marks
4 0 0 4	Total : 100 Marks
	Duration of Exam: 3 Hours

UNIT-1-POLYMERS AND POLYMERIZATION:
Introduction & Classification of polymers. effect of structure on properties of polymers, Bio degradable polymers, preparation, properties and technical application of thermo–plastics (PVC, PVA, Teflon)& thermosets(PF,UF), elastomers (SBR,GR–N), Silicones , Introduction to polymeric composites.

UNIT-2-PHASE RULE:
Terminology, Derivation of Gibb's phase rule. One component system (H_2O system), two components systems: Simple eutectic system (Pb – Ag), system with congruent melting point (Zn – Mg), system with incongruent melting point (Na-K),Cooling curves.

UNIT-3-WATER AND ITS TREATMENT :
Part – I Sources of water, impurities in water, hardness of water and its determination, (EDTA method) units of hardness, alkalinity of water and its determination, Related numerical problems, Problems associated with boiler feed water: scale and sludge formation, Priming and foaming, Boiler corrosion & Caustic embrittlement.

Part – II Treatment of water for domestic use: coagulation, sedimentation, filteration and disinfection. Water softening : Lime-Soda treatment, Zeolite, Ion – exchange process, Mixed bed demineralization, Desalination (Reverse Osmosis , Electrodialysis) & related numericals.

UNIT-4-CORROSION AND ITS PREVENTION:
Mechanism of Dry and wet corrosion (rusting of iron), types of corrosion, galvanic corrosion, differential aeration corrosion, stress corrosion. Factors affecting corrosion, preventive measures (proper design, Cathodic and Anodic protection, Protective coatings, Microbiological Corrosion.

UNIT-5-LUBRICATION AND LUBRICANTS:
Introduction, mechanism of lubrication, classification of lubricants. Additives for lubricants. Properties of lubricants (Flash & Fire point, Saponification number, Iodine value, Acid value , Viscosity and Viscosity index Aniline point, Cloud point and pour point).Biodegradable lubricants.

UNIT-6-ALLOYS :

Classification and necessity for making alloys, Composition properties and uses of following alloys: Brass, Bronze, Gun metal, Duralumin, Steel, Effect of alloying elements like C, Ni, Cr, Mn, Si, Mo and Co on properties of steel

UNIT-7-FUELS :

Definition and characteristics of a good fuel, Classification of fuels with suitable examples, Definition and determination of calorific value of a fuel with the help of bomb calorimeter, Proximate and Ultimate analysis of a fuel and its importance, Merits and demerits of gaseous fuel over other varieties of fuel, Composition properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas (iv) LPG (v) CNG

Text Books:

1. Engineering Chemistry , P.C. Jain Monica Jain (Dhanpat Rai & Co)
2. Chemistry in Engineering & Tech , Vol. I & II , Kuriacose (TMH)

Reference Books:

1. Instrumental methods of Chemical analysis, MERITT & WILLARD (EAST – WEST press)
2. Physical Chemistry , P.W Atkin (ELBS, OXFORD Press)
3. Physical Chemistry W.J.Moore (Orient Longman)

HAS- 107 ENVIORNMENTAL STUDIES
B. Tech. I/II Semester

No. of Credits: 4	Sessional: 40 Marks
L T P Total	Theory: 60 Marks
4 0 0 4	Total : 100 Marks
	Duration of Exam: 3 Hours

UNIT 1 : THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance.
Need for public awareness.

UNIT 2 : NATURAL RESOURCES

Renewable and non-renewable resources :
Natural resources and associated problems.

a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting and mineral resources, case studies.

d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources : Growing energy needs, renewable and non- renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT 3 : ECOSYSTEMS

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem :
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem

d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT : 4 BIODIVERSITY AND ITS CONSERVATION

- Introduction – Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity : in-situ and ex-situ conservation of biodiversity.

UNIT 5 : ENVIRONMENTAL POLLUTION

Definition

- Causes, effects and control measures of :
  a) Air pollution
  b) Water pollution
  c) Soil pollution
  d) Marine pollution
  e) Noise pollution
  f) Thermal pollution
  g) Nuclear hazards
- Solid waste Management : Causes, effects and control measures of urban
- and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management : floods, earthquake, cyclone and landslides.

UNIT 6 : SOCIAL ISSUES AND THE ENVIRONMENT

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.

- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness.

UNIT 7 : HUMAN POPULATION AND THE ENVIRONMENT

- Population growth, variation among nations
- Population explosion – Family Welfare Programme
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

UNIT 8: FIELD WORK

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems – pond, river, hill slopes, etc.

Text Books:

1. Perspectives in Environmental Studies by A. Kaushik and C. P. Kaushik
2. Environmental Studies by J. P. Sharma

Reference Books

1. Environmental Chemistry by A. K. De
2. Environmental Science by Miller
3. Fundamental of Ecology by Odum

HAS- 109 PHYSICS LAB - I

B. Tech. I Semester

No. of Credits: 1		Sessional:	30 Marks
L T P Total		Practical:	20 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	3 Hours

LIST OF EXPERIMENTS

1. To find the wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's biprism experiment.
3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4. To find the refractive index and cauchy's constants of a prism by using spectrometer.
5. To find the wavelength of sodium light by Michelson interferometer.
6. To find the resolving power of a telescope.
7. To find the pitch of a screw using He-Ne laser
8. To find the specific rotation of sugar solution by using a polarimeter.
9. To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.
10. To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.
11. To study the photoconducting cell and hence to verify the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith bridge.
13. To find the frequency of A.C. mains by using sonometer.
14. To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.

Note :

(i) The experiments in Ist semester will be based mainly upon Optics, Electrostatics,
(ii) Students will be required to perform atleast 10 experiments out of the list.

Recommended Books :

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3.Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

MU- 102 BASICS OF MECHANICAL ENGG. LAB

B. Tech. I/II Semester

No. of Credits: 1		Sessional:	30 Marks
L T P Total		Practical:	20 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

List of Experiments:

1. To study the Cochran and Babcock and Wilcox boilers.
2. To study the working and function of mounting and accessories in boiler.
3. To study 2 stroke & 4 stroke diesel engine.
4. To study 2 stroke & 4 stroke petrol engine.
5. To study the vapour compression Refrigeration System and determination of its Coefficient of performance.
6. To study the functioning of Window Room Air Conditioner.
7. To calculate the Mechanical Advantage, Velocity Ratio and efficiency of Single start, Double start and Triple start worm wheel.
8. To calculate the Mechanical Advantage, Velocity Ratio and efficiency of Single Purchase, Double Purchase winch crabs and plot graphs.
9. To study Simple screw jacks and compound screw jacks and determine their efficiency.
10. To find the Mechanical Advantage, Velocity Ratio and efficiency of a Differential Wheel and Axle.
11. To perform tensile test, plot the stress- strain diagram and evaluate the tensile properties of a given metallic specimen.

HAS- 102 PHYSICS –II

B. Tech. II Semester

No. of Credits: 4		Sessional:	40 Marks
L T P Total		Theory:	60 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Part -A

CRYSTAL STRUCTURE

Space lattice, unit cell and translation vector, Miller indices, simple crystal structure. Laue's treatment to Bragg's law, powder method, Point defects in solids – Schottky and Frenkel defects. Bonding in solids- Ionic and covalent bonds.

QUANTUM PHYSICS

Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts. Black Body radiations Discovery of Planck's constant, phase velocity and group velocity. Schrodinger wave equations-time dependent and time independent, Expectation value, Ehrnfest Theorem, particle in a one-dimensional box. Quantum Statistics (Bose-Einstein and Fermi-Dirac Statistics). Elementry ideas of quark, gluons and hadrons.

Part B

NANO-SCIENCE

Features of nanosystems, concept of quantum size effect, quantum dots and their applications.

FREE ELECTRON THEORY

Elements of classical free electron theory and its limitations. Drude's theory of conduction , quantum theory of free electrons. Fermi level, density of states. Fermi-Dirac distribution function. Thermionic emission, Richardson's equation.

Part C

BAND THEORY OF SOLIDS

Origin of energy bands, Kronig-Penny model (qualitative), E-K diagrams, Brillouin Zones,concept of effective mass and holes. Classification of solids into metals, semiconductors and insulators, Fermi energy and its variation with temperature, Hall Effect and its applications

PHOTOCONDUCTIVITY & PHOTOVOLTAICS

Photoconductivity in insulating crystal, variation with illumination, effect of traps, application of photoconductivity, photovoltaics cells, solar cell and its characteristics.

Part D

MAGNETIC PROPERTIES OF SOLIDS

Atomic magnetic moments, orbital diamagnetism, Classical theory of paramagnetism, ferromagnetism, molecular fields and domain hypothesis

Text Books :

1. Concepts of Modern Physics - Arthur Beiser (TMGH)
2. Solid State Physics – S.O.Pillai (New Age Int. Ltd. Pub.)
3. Modern Physics for Engineers – S.P.Taneja (R. Chand)
4. Engineering Physics – SatyaPrakash (Pragati Prakashan)
5. Modern Engineering Physics – A.S.Vasudeva (S. Chand)

Reference Books :

1. Introduction to Solid State Physics – Kittel (John Wiley)
2. Quantum Mechanics – A. Ghatak
3. ATextbook of Engineering Physics-Avadhanulu and Kshirsagar (S.Chand)

HAS- 104 MATHEMATICS –II

B. Tech. II Semester

No. of Credits: 4 Sessional: 40 Marks

L	T	P	Total		
4	0	0	4	Theory:	60 Marks
				Total :	100 Marks
				Duration of Exam:	3 Hours

Part-A

ORDINARY DIFFERENTIAL EQUATION AND ITS APPLICATIONS

Exact differential Eqn.Of first order, Equations reducible to exact differential eqn., differential eqn.of second and higher order Complete solutions =C.F. + P.I, Method of variation of parameter to find P.l., Cauchy's and Legendre's linear Eqn., Simultaneous linear eqns.with constant co-efficient, Application of linear differential eqns.to Electric circuits.

Part-B

LAPLACE-TRANSFORMS AND ITS APPLICATIONS

Laplace-transforms of elementary functions ,Properties of Laplace-transforms,Existance conditions, transforms of derivatives, Transforms of Integrals, Multiplications by t^n,division by t^n, Evaluation of integrals by Laplace – transforms,Laplace-transforms of Unit-step function,unit-impluse function and periodic function,Inverse transforms, Convolution theorem,App. to linear differential eqn.And simultaneous linear differential eqns with constant co-efficients.

PARTIAL DIFFERENTIAL EQUATION AND ITS APPLICATIONS

Formation of partial-differential eqns. Lagrange's linear partial –differential eqns.,First order non-linear partial diff.Eqns.,Charpit's method.Homogeneous Partial-diff eqn.of second and higher order.

Part-C

VECTOR CALCULUS

Differentiation of vectors,scalar and Vector-point functions,Gradient of a scalar field and directional derivatives,divergence and curl of a vector field and their physical interpretations,Integration of vectors,line integral,Surface integral,Volume integral,Green's theorem,Stoke's theorem,Guass theorem and their simple applications.

Text Books:

1. B.S.Grewal,Engg. Mathematics
2. H.C.Taneja ,Engg. Mathematics
3. R.S. Goyal,Engg. Mathematics
4. Babu Ram , Engg. Mathemati

HAS- 111 ESSENTIALS OF COMMUNICATION

B. Tech.I/ II Semester

No. of Credits: 4	Sessional:	40 Marks
L T P Total	Theory:	60 Marks
4 0 0 4	Total :	100 Marks
	Duration of Exam:	3 Hours

UNIT-I-LITERATURE

Science fiction 'Reason'; The Discovery by Herman Ould; 'Three Questions' by Leo Tolstoy; 'Metamorphoses' by Franz Kafka; Excerpt from 'Gitanjali'

UNIT-II-SEMANTICS AND SYNTAX

Words often Confused; Synonyms and Antonyms; One –word Substitutes; Homophones And Homonyms; Idioms; Correct the sentences

UNIT-III- COMPOSITION/WRITING

Paragraph; Case Study; Reports; Dialogue; Creative/Analytical Writing; Unseen Passage; Précis

UNIT-IV-PHONETICS

IPA, Transcription, Use of Phonetic Dictionary, Definitions of Vowels, Consonants

UNIT-V- INTERNAL ASSESSMENT

Newspaper scrap book/Case Study of any great engineering enterprise; Group Discussion; Debate/Declamation

Text Book:

1. Selection of stories from *I, Robot* by Issac Asimov. HarperCollins. 1996
2. Notes/Masterial provided by the teacher
3. Bande Usha and Krishan Gopal ed. *The Pointed Vision: An Anthology of Short Stories.* Oxford UP:
4. Kadyan Asha ed. *Chronicles of Time: An Anthology of Poems*: Oxford UP.2004.
5. Kafka, Franz. *Metamorphosis and Other Stories*. Penguin.

Reference Books:

1. Communication English. ESuresh Kumar, P Sreehari (University College of Engineering,Hyderabad) Orient Longman,2007.
2. Cambridge Phonetic Dictionary CDs(I-IV)
3. Oxford Idioms Dictionary for Learners of English. Oxford University Press.2001
4. Oxford Paperback Dictionary and Thesaurus & Wordpower Guide. Oxford University Press.2001

E- 105 ELECTRICAL TECHNOLOGY

B. Tech. I/II Semester

No. of Credits: 4		Sessional:	40 Marks
L T P Total		Theory:	60 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

UNIT-1-DC CIRCUITS

Introduction of electric circuit, ohm's law, limitations of ohm's law, ideal, Practical and dependent sources and their characteristics, Source transformation, Voltage and Current division, Kirchhoff's Voltage law and Kirchhoff's Current law; Mesh and Nodal analysis.

UNIT-2-AC FUNDAMENTAL

Production of alternating voltage or current, phasor representation of alternating quantity, Instantaneous, Peak, Average and RMS values of periodic waveforms; Peak factor, Form factor; pure R,L & C in AC circuit, j notation and concept of phasor, active, reactive and apparent power, Power factor

UNIT-3-MAGNETIC CIRCUITS

Magnetic Circuits, Magnetic Materials and their properties, static and dynamic emfs and force on current carrying conductor, AC operation of Magnetic Circuits, Hysteresis and Eddy current losses.

UNIT-4-NETWORK THEOREMS

Superposition, Thevenin's and Norton's, Reciprocity, Compensation, Maximum Power transfer, Tellegan's and Millman's theorems, Application of theorems to dc and ac circuits

UNIT-5-AC CIRCUITS:-

AC series circuit RL, RC, and RLC, AC parallel circuits, combination of series and parallel circuits, Series and Parallel resonance, selectivity, bandwidth and Q factor, earthing

UNIT-6-POLYPHASE SYSTEMS:

Advantages of 3-phase systems, generation of 3-phase voltages; phase sequence; star & delta connections; interconnection of 3-phase sources and loads; voltage, current & power in star & delta connected systems, analysis of 3-phase balanced circuits,

measurement of 3-phase power- 2 wattmeter method, effect of power factor on wattmeter reading

UNIT-7-ELECTRICAL MACHINES

Introduction to transformer, DC machines, induction motor, synchronous machines; Principle, construction and working

Text Book:

1. Basic Electrical Engineering by Kothari & Nagrath TMH
2. Principle of electrical Engg. By V. Del Toro Printice Hall
3. Electrical Technology by B L Thereja S.Chand

CE- 101 FUNDAMENTALS OF COMPUTER & PROGRAMMING WITH C

B. Tech. I/II Semester

No. of Credits: 4	Sessional:	40 Marks
L T P Total	Theory:	60 Marks
4 0 0 4	Total :	100 Marks
	Duration of Exam:	3 Hours

UNIT –1- AN OVERVIEW OF COMPUTER SYSTEM AND OPERATING SYSTEMS

Fundamentals: Evolution of computers, Hardware organization of a computer. Introduction to microprocessors, generation of microprocessors, commonly used CPUs. Input/Output Devices, Input/output ports and connectors.

Different Number Systems:- Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, and their inter- conversions.

Operating System Basics: Introduction to Operating system, Functions of an Operating Systems, Classification of Operating Systems, Basic introduction to DOS, UNIX/LINUX OS, Windows XP, working with Windows.Introduction to computer viruses.

UNIT-2- BASIC INTRODUCTION TO PROGRAMMING LANGUAGES

Machine Language, Assembly Languages, High level Languages, Types of high level languages, Complier, Interpreter, Assembler, Loader, Linker, Relationship between Compiler, Loader and Linker.

UNIT-3- BASIC INTRODUCTION TO COMPUTER NETWORKS

Data Communication, modulation, Network devices, LAN, LAN topologies, WAN, OSI Reference model Introduction to Internet and protocols: TCP/IP ref. model, Backbone network, Network connecting devices. Hypertext documents, HTTP, DNS, Network Security.

UNIT-4- AN OVERVIEW OF C

Constants, Variables and Data types, operators and Expressions, managing I/O operations, Decision Making and branching, Decision Making and looping, Arrays, Character Arrays and Strings, User Defined Functions

UNIT-5-STRUCTURE AND UNION IN C

Defining structure, declaring variables, Accessing structure members, structure initialization, copying and comparing structures variables, operations on individual members, Array of structure, structure with structure, unions, size of structure.

UNIT-6-POINTERS IN C

Introduction, Understanding Pointers, Accessing the address of a variable, Declaring Pointer Variables, Initialization of Pointer Variables, Accessing a variable through its pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factors, pointers and Arrays, Pointer and Character Strings, Arrays of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions

UNIT-7- DYNAMIC MEMORY ALLOCATION AND FILE MANAGEMENT IN C

Introduction, Dynamic memory allocation, allocating a block of memory: Malloc, allocating multiple blocks of memory: Calloc. Releasing the used space: Free, Altering the size of block: Realloc, Defining and opening file, closing file, I/O operation on files, error handling during I/O operations, Random Access to files and command line arguments.

Text Books:

1. Fundamental of Information Technology by A.Leon & M.Leon.
2. UNIX Concepts and Application(4/e) by Sumitabha Das
3. Programming Languages (4th Edition) by Pratt IW
4. Fundamentals of Computers and Programming with C by A. K. Sharma Dhanpat Rai publications
5. Computer Networks (4th Edition) by Andrew S. Tanenbaum

Reference Books:

1. Digital Principles and Application by Donald Peach, Albert Paul Malvino
2. Operating System Concepts, (6th Edition) by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.

MU- 103 ENGINEERING DRAWING

B. Tech. I/II Semester

No. of Credits: 2	Sessional:	60 Marks
L T P Total	Theory:	40 Marks
0 0 4 4	Total :	100 Marks
	Duration of Exam:	3 Hours

UNIT-1-INTRODUCTION

Importance, Significance and scope of Engineering Drawing, Lattering, Dimensioning, Scales, Sense of proportioning, different types of projections, orthographic projections, B.I.S Specifications.

UNIT-2-PROJECTION OF POINTS & LINE

Introduction of plain of plane of projection, reference & auxiliary plane, projection of points and line in different quadrants, traces, inclinations & true lengths of the lines, projections on auxiliary plane, shortest distance intersecting and nonintersecting lines.

UNIT-3-PROJECTION OF PLANES

Parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes.

UNIT-4-PROJECTION OF SOLIDS

Projection of Polyhedra, solids of revolution-in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other, projection of section of prisms, pyramids, cylinders and cones.

UNIT-5-DEVELOPMENT OF SURFACE

Development of simple object with and without sectioning

UNIT-6-ISOMETRIC PROJECTION

Introduction, isometric scale, Isometric view of plane figure, prisms, pyramids and cylinders

UNIT-7-ORTHOGRAPHIC DRAWINGS

Orthographic drawings of machines components and Nuts, Bolted Joints, Screw threads, Screw joints

Text Books:

1. Machine Drawing - N D Bhatt and V M Panchal, Charotar Publishing House.
2. A Text Book of Machine Drawing - P S Gill Pub.: S K Kataria & Sons.

3. Engineering Graphics with Auto CAD 2002 - JamesD.Bethune, Pearson Education.

Reference Books :

1. A Text Book of Machine Drawing Laxmi Narayana and Mathur, M/s. Jain Brothers, New Delhi.
2. Machine drawing by N Sidheshwar, Kannaieh, V S Sastry, TMH., New Delhi

HAS- 110 PHYSICS LAB - II

B. Tech. II Semester

No. of Credits: 1		Sessional:	30 Marks
L T P Total		Practical:	20 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	3 Hours

List of Experiments

1. To find the low resistance by carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant diffelction method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photo electric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh bridge.
12. To find the value of Hall Co-efficient of semi-conductor.
13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.

Note : (i) Students will be required to perform atleast 10 experiments out of the list.
(ii) The experiments in Second semester will be based upon Electricity, Magnetism, Modern Physics and Solid State Physics which are the parts of theory syllabus.

Recommended Books :

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan

CE- 103 FUNDAMENTALS OF COMPUTER & PROGRAMMING WITH C

LAB

B. Tech. I/ II Semester

No. of Credits: 1	Sessional:	30 Marks
L T P Total	Practical:	20 Marks
0 0 2 2	Total :	50 Marks
	Duration of Exam:	3 Hours

1. Write a program to add, subtract, multiply and divide two numbers using menu driven program.

2. Write a program to find the largest of three numbers.(using if-then-else)

3.Write a program to find the largest number out of ten numbers (using for- statement)

4. Write a program to find the average mail height & Average female heights in the class(input is in the form of sex code, height) .

5. Write a program to find roots of quadratic equation using functions.

6. Write a program using arrays to find the largest and second largest number out of given 10 numbers using bubble sort.

7. Write a program to multiply two matrices

8. Write a program to read a string and write it in reverse order.

9. Write a program to concatenate two strings.

10. Write a program to sort numbers using the Quicksort Algorithm.

11. Represent a deck of playing cards using arrays.

12. Write a program to check that the input string palindrome or not.

Education plus:

13. Write a program to calculate the length of the string

14. Write a program to find factorial of a number using function.

15. Write a program using structure to enter a list of books, their prices and number of pages.

E- 109 ELECTRICAL TECHNOLOGY LAB

B. Tech. I/ II Semester

No. of Credits: 1		Sessional:	30 Marks
L T P Total		Practical:	20 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	3 Hours

List of Experiments

1. To study various type of meters.
2. To verify KCL and KVL.
3. To verify Thevenin's theorem.
4. To Verify Maximum Power Transfer theorem.
5. To verify Superposition theorems.
6. To study frequency response of a series R-L-C circuit and determine resonant frequency& Q- factor for various Values of R,L,C.
7. To study frequency response of a parallel R-L-C circuit and determine resonant frequency & Q -Factor for various values of R,L,C.
8. To find inductance of coil without core and with U &I shape iron core.
9. To measure power and power factor in a 3-phase system by two wattmeter method.
10. To perform polarity test and find turn ratio of single phase transformer.

Sem III

CE201 **Data Structures Using 'C'**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs.

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Section-A

Overview of 'C': Introduction, Flow of Control, Input output functions, Arrays and Structures, Functions

Data structures and Algorithms: an overview: concept of data structure, choice of right data structures, types of data structures, basic terminology Algorithms, how to design and develop an algorithm: stepwise refinement, use of accumulators and counters; algorithm analysis, complexity of algorithms Big-oh notation.

Arrays: Searching Sorting: Introduction, One Dimensional Arrays, **Operations Defined:** traversal, selection, searching, insertion, deletion, and sorting. Multidimensional arrays, address calculation of a location in arrays.

Searching: Linear search, Recursive and Non recursive binary Search.

Sorting: Selection sort, Bubble sort, Insertion sort, Merge sort, Quick sort, Shell sort, Heap sort

Stacks and queues: Stacks, array representation of stack, Applications of stacks. Queues, Circular queues, array representation of Queues, Deque, priority queues, Applications of Queues.

Section-B Pointers and Linked Lists;

Pointers: Pointer variables, Pointer and arrays, array of pointers, pointers and structures, Dynamic allocation.

Linked Lists: Concept of a linked list,. Circular linked list, doubly linked list, operations on linked lists. Concepts of header linked lists. Applications of linked lists, linked stacks linked Queues.

Section-C Trees and Graphs

Trees: Introduction to trees, binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, threaded binary trees, B Trees, Application of trees.

Graphs: Introduction, terminology, 'set, linked and matrix' representation, Graph traversal techniques: BFS, DFS, operations on graphs, Minimum spanning trees, Applications of graphs.

Section-D File Handling and Advanced data Structure

Introduction to file handling, Data and Information, File concepts, File organization, files and streams, working with files. AVL trees, Sets, list representation of sets, applications of sets, skip lists

Text Books:

1 Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
2 Data Structures using C by A. K. Sharma, Pearson

Reference Books:

1 Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
2 Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
3 Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
4 Data Structures and Program Design in C By Robert Kruse, PHI,
5 Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH
6 Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
7 Data Structure and the Standard Template library – Willam J. Collins, 20

CE203 **Discrete Structures**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Set Theory: Introduction to set theory, Set operations, Algebra of sets, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions , Partial ordering relations and lattices.

Unit-2: Propositional Calculus: Basic operations: AND (^), OR (v), NOT (~), Implication and bi-implication, Truth value of a compound statement, propositions, tautologies, contradictions, Universal and Existential quantifiers, methods of proof, Mathematical Induction, Propositional logic, Hypothesis and Inference, CNF, DNF, PCNF, PDNF.

Unit–3: Techniques of Counting: Permutations with and without repetition, Combination.

Unit-4: Recursion And Recurrence Relation: Linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Unit-5: Algebric Structures: Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Unit-6: Graphs And Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals, Coloring graph problem, bipartite graphs, Travelling salesman problem,

Text Book:

1. Elements of Discrete Mathematics C.L Liu, 1985, McGraw Hill
2. Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
3. Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.

Reference Books:

1. Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
2. Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
3. Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
4. Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA)

CE205 **Digital and Analog Communication**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Communication system components: Introduction to Communication: Definition & means of communications; Digital and analog signals: sign waves, square waves; Properties of signals: amplitude, frequency, phase; Theoretical basis for data communication: Fourier analysis: Fourier series and Fourier Transform (property, ESD, PSD and Raleigh) effect of limited bandwidth on digital signal.

Unit-2: Data Transmission System: Physical connections: modulation, amplitude-, frequency-, phase- modulation; Data encoding: binary encoding (NRZ), Manchester encoding, differential Manchester encoding. Transmission Media: Twisted pair-, co-axial, fiber optic-cables, wireless media Transmission impairments: attenuation, limited bandwidth of the channels, delay distortion, noise, data rate of the channels (Nyquist theorem, Shannon limit). Physical layer interfaces: RS 232, X.21

Unit-3: Standards in data communications: Communication modes: simplex, half duplex, full duplex; Transmission modes: serial, parallel-transmission; Synchronizations: Asynchronous, synchronous-transmission; Type of services: connection oriented, connectionless-services; Flow control: unrestricted simplex protocol, simplex stop- and -wait protocol, sliding window protocol; Switching systems: circuit switching; picket switching: data gram , virtual circuits, permanent virtual circuits. Telephone Systems: PSTN, ISDN, asynchronous digital subscriber line. Multiplexing: frequency division, time, wave division multiplexing

Unit-4: Security in data communications: Transmission errors: feedback, forward-error control approaches; Error detection; Parity check, block sum check, frame check sequences; Error correction: hamming codes, cyclic redundancy check; Data encryption: secret key cryptography, public key cryptography; Data compression: run length encoding, Huffman encoding.

Text Book:

1. Data Communications, Computer Networks and Open Systems Halsall Fred, (4th editon) 2000, Addison Wesley, Low Price edition
2. Reference Books:

3. Business Data Communications, Fitzgerald Jerry, 7th Ed. New York, 2001, JW&S,
4. Communication Systems, 4th Edi, by A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, 2002, TMH.
5. Data Communications, Computer Networks and Open Systems, Halsall Fred, 1996, AW.
6. Digital Communications, J.G. Proakiss, 4th Ed., MGH
7. Satellite Communication, Pratt, John Wiley
8. Data & Computer Communications, W.Stallings PHI
9. Digital & Data Communication systems, Roden 1992, PHI,
10. Introduction to Digital & Data Communications, Miller Jaico Pub.
11. Data Communications and Networking, Behrouz A. Forouzan, 2003, 2nd Edition, T.M.H

CE207 **Digital Electronics & Computer Organization**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1 : Fundamentals of Digital Techniques : Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

Unit-2 : Combinational Design Using Gates : Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

Unit-3: Combinational Design Using MSI Devices: Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors, BCD arithmetic circuits, Encoders, Decoders / Drivers for display devices.

Unit-4 : Sequential Circuits : Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

Unit-5: General System Architecture: Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD): Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

Unit-6: Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086; simulation using MSAM.

Unit-7: Basic non pipelined CPU Architecture: CPU Architecture types (accumulator, register, stack, memory/register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.

Unit-8: Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access cycle time, cost per bit): Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations)

Text Book :

1. Modern Digital Electronics(Edition III) : R. P. Jain; TMH
2. Digital Design : Morris Mano; PHI.

Reference Book :

1. Digital Integrated Electronics : Taub & Schilling; MGH
2. Digital Principles and Applications : Malvino & Leach; McGraw Hill

MGMT 201 **Economics for Engineers.**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs.

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit I
Introduction to the subject: Micro and Macro Economics, Relationship between Science, Engineering, Technology and Economic Development. Production Possibility Curve, Nature of Economic Laws.

Unit II
Time Value of Money: concepts and application. Capital budgeting; Traditional and modern methods, Payback period method, IRR, ARR, NPV, PI (with the help of case studies)

Unit III
Meaning of Demand. Law of Demand, Elasticity of Demand; meaning, factors effecting it and its practical application and importance. Demand forecasting (a brief explanation)

Unit IV
Meaning of Production and factors of production, Law of variable proportions and returns to scale. Internal and external economies and diseconomies of scale. Concepts of cost of production, different types of costs; accounting cost, sunk cost, marginal cost, Opportunity cost. Break even analysis, Make or Buy decision (case study). Relevance of Depreciation towards industry.

Unit V
Meaning of market, types of market, perfect competition, Monopoly, Monopolistic, Oligopoly. (main features). Supply and law of supply, Role of demand and supply in price determination.

Unit VI
Indian Economy, nature and characteristics. Basic concepts; fiscal and monetary policy, LPG, Inflation, Sensex, GATT, WTO and IMF. Difference between Central bank and Commercial banks

Books

5. Jain T.R., Economics for Engineers, VK Publication
6. Chopra P. N., Principle of Economics, Kalyani Publishers
7. Dewett K. K., Modern economic theory, S. Chand
8. H. L. Ahuja., Modern economic theory, S. Chand
9. Dutt Rudar & Sundhram K. P. M., Indian Economy
10. Mishra S. K., Modern Micro Economics, Pragati Publications
11. Pandey I.M., Financial Management; Vikas Publishing House
12. Gupta Shashi K., Management Accounting, Kalyani Publication

HAS-203-C **MATHEMATICS – III**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-I

Fourier Series and Fourier Transforms : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series.

Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Unit-II

Functions of Complex Variable : Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions, Limit and Continuity of a function, Differentiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

Unit-III

Probability Distributions and Hypothesis Testing : Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.

Linear Programming : Linear programming problems formulation, Solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

TEXT BOOKS :

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

REFERENCE BOOKS :

1. Advance Engg. Mathematics : R.K. Jain, S.R.K.Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson. PHI.

Sem IV

CE202 **Database Management Systems**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit–1:Introduction Overview of database Management System; Various views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of Database Administrator,

Unit-2: Introduction to Client/Server architecture, Three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables.

Unit-3: File Organisation: Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.

Unit-4: Relational Model, Relational Algebra & various operations, Relational and Tuple calculus.

Unit-5: Introduction to Query Languages : QLB, QBE, Structured query language – with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION – (up to 4th Normal forms), BCNF (Boyce – code normal forms)

Unit-6: Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to Concurrency control and Recovery systems.

Text Books:

1. Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
2. Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.
3. Reference Books:
4. Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.

5. An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.

CE204 Computer Networks

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: OSI Reference Model and Network Architecture: Introduction to Computer Networks, Overview of Data Communication and Networking - Analog / Digital transmission, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks: Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer.

Unit-2: Data Link Layer: Error detection and correction, Data link control - Flow and Error control - Sliding window protocol - ARQ schemes, HDLC protocol - Point to Point Protocol, Multiple Access Techniques - Random Access, Controlled Access, Logical Link Control (LLC) and Medium Access Sub-layer functions - LAN standards - IEEE 802.3 (CSMA/CD) - Fast Ethernet - Giga Bit Ethernet, IEEE 802.4 (Token Bus), IEEE 802.5 (Token Ring), IEEE 802.11 (Wireless LAN).

Unit-3: Network Layer: Inter-networking - Addressing - Routing - Link state and Distance Vector Routing - Congestion control algorithms - Network Layer Protocols - ARP, RARP, IPv4, ICMP, IPv6 and ICMPv6 - Unicast Routing - RIP, OSPF, BGP and Multicast Routing - IGMP, DVMRP, MOSPF, CBT, PIM.

Unit-4: Transport Layer: Processes to Processes Delivery - Transmission Control Protocol (TCP) - User Datagram Protocol, Stream Control Transmission Protocol (SCTP) - Data Traffic - Congestion Control and Quality of Service - Techniques to improve QOS - Integrated Services - Differentiated Services, QoS in switched networks.

Unit-5: Session, Presentation and Application Layers: Services, Network security - security Cryptography, Message confidentiality, message integrity, message authentication, Digital Signature, Entity Authentication, Key Management, Application layer- DNS, E-mail (SMTP), FTP, HTTP, Voice over IP.

ATM,ISDN,SONET

Text Book:

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

2. Forouzan, Data Communications and Networking, TMH, 4 th Edition, 2006.
3. William Stallings, Data and Computer Communications, PHI, 7 th Edition, 2003

Reference Books:

1. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred,2000, Addison Wesley, Low Price Edition.

IT206 **Rapid Application Development**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Visual Programming Environment: Concept of procedure and event oriented languages, Integrated Development Environment for VC++ and Components of Visual C++.
Visual Basic: Integrated Development Environment for VB- Events, Menu bar, Popup Menus, Tool bar, Message box, Message Box, Input Box, Built-in Dialog Boxes, Creating MDI, Working with Menus and Understanding the Data Controls and Bound Controls, Introduction to Data Form Wizard, Introduction of DAO, and Working with Record sets.

Unit-2: **Parts of Visual C++ Program:** Application object, main window object, view object, document object, Document-View architecture and its advantages, event oriented windows Programming, device context, Microsoft Foundation Classes- an Overview, Simple MFC application, API's .

Unit-3: Reading keystrokes, handling mouse, creating menus, toolbars, buttons, status bar prompts, dialog box, check box, radio buttons, list boxes, combo boxes, sliders, multiple documents.

Unit-4: Serialization, file handling, debugging.

Unit-5: DLL's, OLE Object Technologies, Creating Internet Programs using Visual C++, Connecting to Database (using DAO/ ADO/ RDO) using Visual C++.
Visual Basic and databases: Creating Active X Controls,
Connecting to Database (using DAO/ ADO/ RDO) using Visual Basic.

Text Books

- Microsoft Visual C++ By Steven Holzner (Pub: BPB)
- Visual C++ Programming, 2nd edition by Steven Holzner(Pub: PHI)
- Using Visual Basic for Applications By Paul Sanna(Pub: PHI)
- Visual Basic Programming By Steven Holzner

Reference Books

- Visual C++: From the ground Up By Mucller (Pub :TMH)
- Programming Visual C++ by David J. Kruglinski

CE208 Object Oriented Programming Using C++

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-I

Basics of Object Oriented Programming (OOP):
Introduction to OOP – Difference between OOP and procedure oriented Programming – Classes, objects and Methods – Overview of inheritance and Polymorphism.

Object Oriented Design:
Trends in software design – Notation for objects – Hybrid design methods – Seperation of Responsibilities – Responsibility driven design – Design phases and tools – step by step design – UML Approach.

UNIT-II:
Fundamentals of C & C++:
Structure of C/C++ program – Preprocessor directives – data types and declaration – Expressions and operator precedence – Program flow control – Functions – Scope of variables – Default arguments – Dynamic allocation – new and delete operators.

UNIT-III
Data Abstraction:
Class definition – controlling access to other functions – Different types of constructors – Destructor – Objects and classes – Dynamic creation and destruction of objects.

Polymorphism:
Overloading functions and operators – Run time polymorphism – overloading new and delete operators.

UNIT-IV
Inheritance:
Derived classes – syntax of derived classes – Access to the base class – overloading inherited member functions – multiple inheritance – virtual base class Virtual functions and Polymorphism: static and dynamic bindings – virtual functions – pure virtual functions – dynamic binding through virtual functions – Virtual function call mechanism – Implications of polymorphic use of classes – virtual destructors – calling virtual functions in a base class constructor.

UNIT-V

C++ I/O:

Standard I/O using C functions – stream I/O in C++ - manipulators – Formatted I/O – Overloading << and >> operators – File I/O.

Generic Classes in C++:

Necessity of Templates – Generic Classes using Macros – Class templates – Function Templates – Advantages of Templates.

Exception Handling in C++:

Benefits of exception handling-troubles with standard C functions (setjmp and longjmp) – Proposed exception handling mechanism for C++.

CE210 **Computer Graphics**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit – 1:
Computer Graphics & its types, Applications of computer graphics, Graphics system: Video Display Devices, Raster scan system, Random scan system, Input Devices, Graphics software.

Unit-2:
Output primitives: point & lines, Line drawing algorithms: DDA, Bresenham, Circle drawing algorithms, Ellipse generating algorithm, Fill Area Primitives: Polygon fill algorithm, Inside-outside test, Boundary fill algorithm, Flood fill algorithm.

Unit-3:
Two-dimensional geometric transformations: Basic Transformations, Matrix representations and homogeneous co-ordinate representations, composite transformations, Instance transformations.
Two-dimensional Viewing: the viewing pipeline, window to view port transformation, clipping operations: point clipping, line clipping, polygon clipping, text clipping.

Unit-4:
Three- dimensional Transformation: translation, rotation, scaling. Projection: types of projection & their matrix representations.

Unit-5:
Visible-surface detection methods: Classification of visible surface detection algorithms, Z-buffer methods, Scan line method, Depth sorting method, BSP-tree method, Area subdivision method.

Unit-6:
Illumination models & Surface-rendering methods: light sources, basic illumination models: ambient light, diffuse reflection, specular reflection & phong model.

Suggested Readings:

1. Donald Hearn and M.Pauline Baker: Computer Graphics, PHI Publications.
2. Plastock: Theory & Problem of Computer Graphics, Schaum Series.
3. Foley & Van Dam: Fundamentals of Interactive Computer Graphics, Addison-Weseley.
4. Newman: Principle of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K: Computer Graphics, Springer-verleg.

CE212 **OPERATIONS RESEARCH**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-I:
The origin of OR, Phases of an O.R. study, Impact of OR, Formulation of Linear-programming model, Graphical solution. Converting the linear programming problem to standard form, Simplex method.

Unit-II:
Big-M method, Two-phase method, Degeneracy, Alternate optima, unbounded and infeasible solution.

Unit-III:
Definition of the dual problem, prima-dual relationship, Dual Simplex method, Post optimal and sensitivity analysis.

Unit-IV:
Assignment problem and its mathematical formulation, solution of assignment problem (Hyngarian method), Transportation problem and its mathematical formulation. Initial basic feasible solution of transportation problem by Northwest corner rule. Lowest-Cost Entry method and Vogel's Approximation method, Optimal solution of transportation problem.

Unit-V:
Network models, Minimal spanning tree algorithm, Shortest-route problem (Floyd's Algorithm and Dijkstras algorithm), Maximal flow problem, Introduction to CPM & PERT.

Unit-VI:
Introduction to Dynamic Programming, General inventory Model, Static Economic Order Quantity (EOQ) Models.

Unit-VIII:
Elements of a Queuing model, Pure Birth & Death model, Generalized Poisson Queuing, Specialized Poisson Queues.

Books Recommended:

1. Operations Research by Hamdy A Taha
2. Introduction to Operations Research by Hiller and Dieherman, TMH
3. Optimization Theory and Application: SS Rao, John Wiley.

Sem V

CE301 **Principles of Operating Systems**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: **Introduction**: Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

Unit–2: **Process Management**: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Unit–3: **Process-Synchronization & Deadlocks**: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery

Unit–4: **Memory Management**: Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

Unit–5: **File System**: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

Unit-6: **I/O Systems**: I/O Hardware, Application I/O Interface, Kernel and Transforming I/O requests, Performance Issues.

Unit–7: **Case Study**
Unix/Linux system call for processes and file system management, Shell programming, Overview of Windows XP

Text Books:

- Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley.
- Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
- Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall

Reference Books:

- Operating System By Peterson , 1985, AW.
- Operating System By Milankovic, 1990, TMH.
- Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
- Operating Systems by Mandrik & Donovan, TMH
- Operating Systems By Deitel, 1990, AWL.
- Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H
- Unix Shell Programming by Yashwant Kanetkar

CE303 **Internet Fundamentals & Web Technology**

L	T	P	Class Work:60 Exam: 90 Total: 150 Duration of Exam: 3 Hrs.
4			

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction to Netwroks : Classification of Networks, Networking Models, Packet Switching, Introduction to internet, history, Working of Internet, Modes of Connecting to Internet ,Internet Protocols: Internet Protocol (IP) , Transmission Control Protocol (TCP), Internet Address , standard address, DNS. Internet Service Providers(ISPs),Subnetting ,Supernetting

Unit-3 : World Wide Web : Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP, E Mail, Chat Servers, net meeting, video conferencing.

Unit-4: Hypertext markup language: The anatomy of an HTML document: Marking up for structure and style: basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, nesting and targeting.

Unit 5: Separating style from structure with style sheets: Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Unit 6: Client side programming: Introduction to the Java Script syntax, the Document object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields and images; Applications

Unit 6: **Server Side Programming:** Introduction to Server Side Technologies ASP/JSP, Programming languages for server Side Scripting, applications; Input/output operations on the WWW, Forms processing (VBSCRIPT/Java SCRIPT)

Unit 7 : Other dynamic content technologies: Delivering multimedia over web pages, the VRML idea.

Text Book:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH

- Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

Reference Books:

- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Network firewalls, Kironjeet syan -New Rider Pub.

IT 305 **Multimedia Technology**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Unit-2: Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Unit-3: Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; sub band coding; Fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Unit-4: Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.
Applications of environment in various fields.

Text Books:

- An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
- Multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:

- Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
- Multimedia on the PC, Sinclair,BPB

- Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
- Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
- Multimedia in Practice by Jeff coate Judith, 1995,PHI.
- Multimedia Systems by Koegel, AWL
- Multimedia Making it Work by Vaughar, etl.
- Multimedia Systems by John .F. Koegel, 2001, Buford.
- Multimedia Communications by Halsall & Fred, 2001,AW.

IT307 **Network Programming & Administration**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction to networking, TC/IP Protocol architecture, Classful internet addresses, subnets, super netting, address resolution Protocol (RAP) and RARP, IP datagram format, UDP and TCP/data grams , TCP connection establishment and Format, Buffer sizes and limitation, ICMP its purpose , FINGER, NET STAT details & IP config, Ping, TRACERT, ROUTE.

Unit-2: Socket introduction, Address structures, value – result arguments, Byte ordering and manipulation function and related functions, elementary TCP sockets, TCP client sever, I/O functions, select& poll functions, socket options elementary UDP sockets, elementary node and address conversions, DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information, echo service (TCP and UDP).

Unit-3: Algorithm and issues in server software design :iterative connectionless servers, (UDP), Iterative, connection oriented servers (TCP), single process, concurrent servers multiprotocol servers (TCP,UDP), multi service servers (TCP,UDP).

Unit-4: Remote procedure call concept (RCP) :RPC models, analogy between RPC of client and server, remote programs and procedures, their multiple versions and mutual exclusion communication semantics, RPC retransmits, dynamic port mapping ,authentication.

Unit-5: **N**etwork file system concept of data link access, debugging techniques ,Routing sockets, broadcasting to mobile network.

Text Books:

- Unix Network programming Vol -2nd edition, W.Richard Stevens
- Internet working with TCP/IP Vol-1, Doubles e-commer.
- Internetworking TCP/IP Vol III Doubles E comer, David L.Stevens

Reference Book:

- Internetworking with TCP/IP, Vol II

CE 309 **Wireless Communications**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction to Wireless Communication System: Evolution of mobile radio communications, examples of wireless communication systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

Unit-2:Modern Wireless Communication System: Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area Networks.

Unit-3:Introduction to Cellular Mobile Systems: Spectrum Allocation, Basic cellular Systems, performance criteria, Operation of Cellular systems, Analog cellular systems, Digital cellular systems.

Unit-4:Cellular System Design Fundamentals: Frequency Reuse, channel assignment strategies, hand off strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

Unit-5: Multiple Access Techniques for Wireless Communication: Introduction to Multiple Access, FDMA, TDMA, spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

Unit-6: Wireless Networking: Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless network, wireless data services, common channel signaling, ISDN (Integrated Service Digital Networks), Advanced Intelligent Networks.

Unit-7:Intelligent Cell Concept and Application: Intelligent cell concept, applications of intelligent micro cell systems, in-building communication, and CDMA cellular radio networks.
Bluetooth,GSM

Text Books:

1. Wireless Communications: Theodore S Rappaport; Pearsons
2. Mobile Cellular Telecommunication: W.C.Y. Lee; McGraw Hill

Reference Books:

1. Mobile Communications: Jochen Schiller; Pearson

IT311 **Network Security**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1 Introduction:

Introduction to security, characteristics of computer intrusion, Attacks: vulnerabilities, threats, attacks and controls, security goals, Computer criminals.

Unit- 2 Basic Encryption and Decryption:

introduction to Ciphers, Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic Ciphers, Polyalphabetic Ciphers such as Vigenere Tableaux, Cryptanalysis of Polyalphabetic Ciphers, Perfect Substitution Cipher such as the Vernam Cipher, Stream and Block Ciphers.

Unit-3 Secure Secret Key Encryption and hash fuction:

Data Encryption Standard (DES), Analyzing and Strengthening of DES, Advance Encryption Standard (AES), Concept of Public key Encryption System, Rivest-Shamir-Adelman (RSA) Encryption, Hash Concept, Description of Hash Algorithms , Message Digest Algorithms (MD5) , Secure Hash Algorithms(SHA) .

Unit-4 Network Security Practice: Authentication Applications- Kerberos, X.509 Authentication Service; Electronic Mail Security- Pretty Good Privacy, S/MIME;

IP Security: IP Security Overview,IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations;

Web Security: Web Security Considerations, Secure Sockets Layer and Transport Layer Security, Secure Electronic Transaction

Reference Books:

1. William Stalling, Cryptography and Network Security, 3rd Edition. PHI New Delhi
2. William Stalling, Network Security Essentials, 2nd Edition. PHI New Delhi

Sem VI

CE 302 **Principles of Software Engineering**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction: Evolving role of software, Software Characteristics, Software crisis, Silver bullet, Software myths, Software process, Personal Software Process (PSP), Team Software Process (TSP), emergence of software engineering, Software process, project and product

Unit-2 : Software Metrics: Size oriented metrics, Function oriented metrics, Use-case oriented metrics, metrics for software quality, metrics collection and Software metrics program.

Unit 3: Software project management: Project management concepts, Planning the software project, Estimation—LOC based, FP based, Use-case based, empirical estimation COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Unit-4 : Requirements, Analysis and specification: Requirements engineering, system modeling and simulation, Analysis principles, modeling, Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

Unit-4: System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation.
Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs, architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design. User Interface Design

Unit-5 : Testing and Maintenance: Testing terminology—error, bug/defect/fault, failure, Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Software Testing Strategies: Verification and validation, Test case design, Static testing -- formal technical reviews: The review meeting, review reporting and record keeping, review guidelines, Dynamic testing--- Black box testing—Boundaru value analysis, White box testing-- basis path testing, Control structure testing, testing for specialized environments , architectures and applications., Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches.

Unit-6 : Software Quality Models and Standards: : Quality concepts, Software quality assurance , SQA activities, Formal approaches to SQA; Statistical software quality assurance; CMM, The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard

Unit-7: Advanced topics in software Engineering: CASE tools, Change Management, Software re-engineering , reverse engineering ,restructuring, forward engineering, Clean Room software engineering

Text Book:

- Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.

Reference Books:

- Fundamentals of software Engineering, Rajib Mall, PHI
- Software Engineering by Ian sommerville, Pearson Edu, 5th edition, 1999, AW,
- Software Engineering – David Gustafson, 2002, T.M.H
- Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995
- JW&S,
- An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

Business Data Communications, Fitzgerald Jerry,.
Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition
Computer Networking – ED Tittel , 2002, T.M.H.

IT304 **HIGH SPEED NETWORKS**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

UNIT I

HIGH SPEED NETWORKS : Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories – AAL.High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fiber Channel – Wireless LANs: applications, requirements – Architecture of 802.11

UNIT II

CONGESTION AND TRAFFIC MANAGEMENT : Queuing Analysis- Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III

TCP AND ATM CONGESTION CONTROL :TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management.

UNIT IV

INTEGRATED AND DIFFERENTIATED SERVICES : Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services

UNIT V

PROTOCOLS FOR QOS SUPPORT : RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP – Protocol Architecture, Data TransferProtocol,RTCP.

TEXTBOOK

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education,SecondEdition,2002.

REFERENCES

1. Warland & Pravin Varaiya, "HIGH PERFORMANCE COMMUNICATION NETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
2. Irvan Pepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", CiscoPress,Volume1and2,2003

CE306 **Real Time Systems**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit I Embedded Systems

What is an embedded system? Categories: Stand-alone, Real-time, Networked appliances, mobile devices. Requirements of Embedded systems, Challenges and issues in Embedded software development. Embedded Software Development Tools: Host and Target machines, Linker/ locators for embedded software, Getting embedded software into target system.

Unit II Real Time Embedded systems

Definition, characteristics, classification, release times, deadlines and timing constraints, temporal parameters of real-time workload, periodic task model, issues involved in real time system design.

Unit III Real Time Operating Systems

Typical structure of an RTOS, Scheduling strategies, priority structures, task management, memory management, code sharing, task co-operation and communication, interrupt routines in an RTOS environment, mutual exclusion, Liveness, Minimum operating system Kernel, capabilities of commercial RTOS: VxWorks, pSoS, Micro C/OS II.

Unit IV Task assignment and Scheduling

Allocation / Scheduling problem, offline scheduling, online scheduling, pre-emptive / non-pre-emptive scheduling, static / dynamic scheduling, Rate-monotonic scheduling algorithm, problem of priority inversion, priority inheritance protocol, priority ceiling protocol, earliest-deadline-first scheduling algorithm

Unit V Real-Time Language Issues

Real-time language requirements, data typing, control structures, facilitating hierarchical decomposition, synchronization, packages, exception handling, overloading and generics, multitasking, low-level facilities,

Unit VI Fault-Tolerance Techniques

Fault types, fault detection measures, fault detection mechanisms, fault and error containment, Redundancy: Hardware and software redundancy, time redundancy.

Unit VII Case Study of RTLinux and VxWorks RTOS

References:

1. Programming for Embedded systems by Dreamtech software team, Wiley Dreamtech India Pvt. Ltd.
2. Embedded Realtime systems programming, by Sriram V. Iyer and Pankaj Gupta, TMH
3. Realtime computer control by Stuart Bennett, Pearson Education
4. Real time systems by C. M. Krishna, McGraw-Hill
5. Embedded Systems by RajKamal, TMH

IT308 **Mobile Adhoc Networks**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

UNIT I :
Introduction: Wireless Networks, Infrastructure and Infrastructure less Wireless Networks, Ad hoc Wireless Networks, Heterogeneity in Mobile Devices, Types of Ad hoc Mobile Communications, Challenges Facing Ad hoc Mobile Networks, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks , classifications of Routing Protocols: Table Driven Routing Protocols, On-Demand Routing Protocols

UNIT II
Table-Driven Ad hoc Routing Protocols: Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Cluster Switch Gateway Routing (CSGR)

UNIT III:
On-Demand Ad hoc Routing Protocols:Ad hoc On–Demand Distance Vector Routing (AODV) , Dynamic Source Routing (DSR) ,Temporally Ordered Routing Algorithm (TORA) , Signal Stability Routing (SSR) , Location–Aided Routing (LAR) , Power–Aware Routing (PAR) , Zone Routing Protocol (ZRP).

UNIT IV:
QoS in Ad hoc Networks:Issues and Challenges in Providing QoS in Ad hoc Wireless Networks , classifications of QoS Solutions , MAC Layer Solutions , Network Layer Solutions , QoS Frameworks for Ad hoc Wireless Networks Energy Management in Ad hoc Wireless Networks.

UNIT V:
Energy ManagementNeed for Energy Management in Ad hoc Wireless Networks – Classification of Energy Management Schemes – Battery Management Schemes – Transmission Power Management Schemes – System Power Management Schemes.

TEXT BOOKS
1. C. Siva Ram Murthy and B. S. Manoj, “Ad Hoc Wireless Networks Architectures and Protocols”, Prentice Hall, PTR, 2004.
2. C. K. Toh, “Ad Hoc Mobile Wireless Networks Protocols and Systems”, Prentice Hall, PTR, 2001.
3. Charles E. Perkins, “Ad Hoc Networking”, Addison Wesley, 2000

IT310 **.NET Technology**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-I: Introduction to .Net Framework

Introduction to .NET, The origin of .NET, Basics of .Net Framework & its Key design goals, 3-tier architecture, managed code, assemblies, CLR, Execution of assemblies code, IL, JIT, .NET framework class library, common type system, common language specification, Scalability; metadata; Deployment and Execution.

.Net Framework Base Classes : Inside the .NET Class Framework; System Namespaces; the System Types; System.object class; System.Exception Class; System.Collections;

Unit-II: Understanding the Development Environment

The Visual Studio Start Page; Creating and Opening Projects; Visual Studio.Net work area; Understanding Window Behavior; Designing Visual Components; Using the task list; Customizing the IDE Event procedures, properties and controls: Event Procedure-Using the IDE to create an Event procedure; Writing code inside the Event Procedure; Viewing and changing properties; Adding controls to the form.

Unit-III: Introduction to VB .Net and C#

Data Types C#: Data Types, Operators, Garbage Collection, Jagged Array, Collection (Array list, Hash table), Indexer (one Dimension) and property, Delegates and events.

User Interface: Message boxes; Dialog boxes; Menus and Toolbars; creating menu; adding Toolbars and buttons; defining an icon for a toolbar button; Adding Functionality to the Toolbar; Exception Handling.

Unit-IV: ADO.Net & Object Oriented Concepts

Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Data Grid Constructor, Destructor, Abstraction, Interface, polymorphism (Over loading and over ridding).

Unit-V: ASP. Net

Anatomy of ASP .NET Page, Server Controls : label, dropdown list box, validation controls, list box, text box, radio button, check box, State Management : session caching, Authentication (window,.Net Passport, Forms Based), Authorization, web services, Advance Grid Manipulation.

Text Books:

1. Jeffrey Richter, Francesco Balena : Applied .Net Framework
Prog. In MS VB. Net, TMH Publications.
2. Herbert Schildt : Complete Reference C#, TMH Publication.
3. Michael Halvorsan : Microsoft Visual Basic.NET step by step,PHI Publication.

Elective-I

CE318 Neural Networks

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Overview of biological neurons: Structure of biological neurons relevant to ANNs.

Unit-2: Fundamental concepts of Artificial Neural Networks: Models of ANNs; Feed forward & feed back networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner –lake all learning rule, etc.

Unit-3: Single layer Perception Classifier: Classification model, Features & Decision regions; training & classification using discrete perception, algorithm, single layer continuous perception networks for linearly separable classifications.

Unit-4: Multi-layer Feed forward Networks: linearly non-separable pattern classification, Delta learning rule for multi-perceptron layer, Generalized delta learning rule, Error back-propagation training, learning factors, Examples.

Unit-5: Single layer feed back Networks: Basic Concepts, Hopfield networks, Training & Examples.

Unit-6: Associative memories: Linear Association, Basic Concepts of recurrent Auto associative memory: retrieval algorithm, storage algorithm; By directional associative memory, Architecture, Association encoding & decoding, Stability.

Unit-7: Self organizing networks: UN supervised learning of clusters, winner-take-all learning, recall mode, Initialization of weights, separability limitations

Text Books:

- Introduction to artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

Reference Books:

- “Neural Networks :A Comprehensive formulation”, Simon Haykin, 1998, AW
- “Neural Networks”, Kosko, 1992, PHI.
- “Neural Network Fundamentals” – N.K. Bose , P. Liang, 2002, T.M.H

CE320 Introduction to E-commerce & ERP

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Part-A

Unit-1: Introduction and Concepts: Networks and commercial transactions – Internet and other
novelties; networks and electronic transactions today, Model for commercial transactions; Internet environment – internet advantage, worlds wide web and other internet sales venues; Online commerce solutions.

Unit-2: Electronic Payment Methods: Updating traditional transactions; Secure online transaction models; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks. Security protocols.

Unit-3: Electronic Commerce Providers: On-line Commerce options: Company profiles.
Electronic Payment Systems: Digital payment systems; First virtual internet payment system; cyber cash model. On-line Commerce Environments: Servers and commercial environments; Ecommerce servers.

Unit-4: Digital Currencies: Operational process of Digicash, Ecash Trail; Using Ecash; Smart cards; Electronic Data Interchange: basics, EDI versus Internet and EDI over Internet. Strategies, Techniques and Tools, Shopping techniques and online selling techniques.

Part- B

Unit-5: ERP- An Enterprise Perspective: Production Finance, Personnel disciplines and their relationship, Transiting environment, MIS Integration for disciplines, Information/Workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

Unit-6: ERP – Resource Management Perspective: Functional and Process of Resource. Management, Introduction to basic Modules of ERP System: HRD, Personnel Management, Training and Development, Skill Inventory, Material Planning and Control, Inventory, Forecasting, Manufacturing, Production Planning, Production Scheduling, Production Control, Sales and Distribution, Finance, Resource Management in global scenario.

Unit-7: ERP - Information System perspective: Introduction to OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR,. SCM, REP, CRM, Information Communication Technology.

Unit-8: ERP-Key Managerial issues: Concept Selling, IT Infrastructure, Implication, of ERP Systems on Business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, ERP Selection issues, Return on Investment, Pre and Post Implementation Issue

Text Book:

- "Frontiers of electronics Commerce" Ravi lalakota, Andrew Whinston ,1996, Addision Wesley,
- Enterprise Resource Planning-Concepts and Practice, V.K. Garg and N.K. Venkita Krishna, 1998, PHI.

Reference Books:

- The SAP/3 Handbook, John Antonio, Fernandz, TMH.
- "The E-Business Revolution" Denial amor Addision Wesley
- "From Edi to E-Commerce: A Business Initiative" Sokol TMH
- "E Commerce" Greenstein and Feinman TMH
- "E Commerce" Excel, Diwan, Sharma
- Asset International "Net Commerce" TMH
- "E Commerce: The Cutting Edge of Business" Bajan And Nag TMH
- E-Commerces- Jaffrey F. Rayport , Bernard J. Jaworski, 2002, T.M.H
- Electronic Commerce – Security , Risk management and Control , Greenstein, Feinman, 2002, T.M.H

CE322 **Fuzzy Logic**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit - 1 Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, a-cuts, Properties of a-cuts, Decomposition, Theorems, Extension Principle,

Unit - 2 Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations

Unit - 3 Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

Unit - 4 Fuzzy Relations: Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations.

Unit – 5 Possibility Theory: Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory.

Unit – 6 Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

Unit – 7 Uncertainty based Information: Information & Uncertainity, Nonspecificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.

Unit – 8 Applications of Fuzzy Logic in soft computing.

Text / Reference books :

- Fuzzy Sets, Uncertainty & Information by G.J.Klir & T.A. Folyger, PHI, 1988.
- Fuzzy sets & Fuzzy logic by G.J.Klir & B.Yuan, PHI, 1995.

CE324 **Digital Signal Processing**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Discrete-Time Signals: Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

Unit-2 : Discrete-Time Systems: Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

Unit-3 : Sampling of Time Signals: Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

Unit-4 : Z-Transform : Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

Unit-5 : Basics of Digital Filters : Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

Unit-6 : Multirate Digital Signal Processing : Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

Text Books :

- Digital Signal Processing : Proakis and Manolakis; PHI
- Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

Reference Books:

- Digital Signal Processing: Alon V. Oppenhelm;PHI
- Digital Signal processing(II-Edition): Mitra, TMH

CE326 **Data Warehousing and Data Mining**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: **Introduction to Data Warehouse:** Data warehousing Definition, usage and trends. DBMS Vs data warehouse, Data marts, Metadata, concept hierarchies, Multidimensional data model, Data cubes, Schemas for Multidimensional Database: star, snowflake and fact constellation; OLAP operations.

Unit-2: **Data Warehouse Design**: The design process, 3-Tier data warehouse architecture, types of OLAP servers: ROLAP, MOLAP, HOLAP; distributed and virtual data warehouses, data warehouse process managers: Load manager, warehouse manger and query manager.

Unit-3: **Data Warehouse Implementation:** Computation of data cubes, modeling OLAP data, indexing, data warehouse back-end tools, complex aggregation at multiple granularities, tuning and testing of data warehouse.

Unit-4: Data Mining: Definition & task, Data mining system architecture, KDD process, KDD versus data mining, data mining tools and applications.

Unit-5: Data mining query language: Basic concepts, task-relevant data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification using DMQL, data mining languages and standardization.

Unit-6: Data Mining Techniques: Association rule mining: a-priori algorithm, generating rules; Clustering techniques: partitioning methods, hierarchical and density based methods; Classification techniques: Decision tree knowledge discovery, back-propagation through Neural Networks, Genetic Algorithm, Rough Sets, Support Vector Machines and Fuzzy techniques; Prediction techniques: linear and non-linear regression.

Text Books:

- Data Warehousing In the Real World; Sam Anahory & Dennis Murray; 1997, Pearson
- Data Mining- Concepts & Techniques; Jiawei Han & Micheline Kamber- 2001, Morgan Kaufmann.
- Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderbad.

Reference Books:

- Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson,
- Data Warehousing, Data Miniing and OLTP; Alex Berson, 1997, Mc Graw Hill.
- Data warehousing System; Mallach; 2000, Mc Graw Hill.
- Building the Data Warehouse; W.H. Inman, 1996, John Wiley & Sons.
- Developing the Data Warehouses; W.H Ionhman,C.Klelly, John Wiley & Sons.
- Managing the Data Warehouses; W.H.Inman, C.L.Gassey, John Wiley & Sons.

Sem VII

IT401 **OPTICAL NETWORKS**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

UNIT 1, "Introduction to Optical Networking"
Introduction SONET/SDH and dense wavelength-division multiplexing (DWDM) , Add/drop multiplexers (ADMs), ADM nodes on the ring. Multiservice provisioning platforms - ADM, DACS, RPR, SAN transport, DWDM, and Ethernet switching.

UNIT 2, "Fiber-Optic Technologies"
This chapter discusses the physics behind fiber-optic cables. It examines various linear effects, such as attenuation and dispersion, as well as nonlinear effects at high bit rates with WDM signaling. Various fiber types are presented along with their refractive index profiles. Fiber loss budget analysis is also presented with examples.

UNIT 3, "Wavelength-Division Multiplexing"
Wavelength-division multiplexing principles, coarse wavelength-division multiplexing, dense wavelength-division multiplexing, the ITU grid, WDM systems, WDM characteristics, impairments to transmission, and dispersion and compensation in WDM systems. OSNR calculations for fiber amplifiers.

UNIT 4, "SONET Architectures"
SONET framing, multiplexing, virtual tributaries, SONET network elements, SONET topologies, SONET protection mechanisms, APS, two-fiber UPSR, DRI, and two-fiber and four-fiber BLSR rings.

UNIT 5, "Packet Ring Technologies"
Ethernet over SONET/SDH encapsulation schemes, Ethernet over SONET/SDH using ANSI T1X1.5 147R1 Generic Framing Procedure (GFP) headers, Ethernet over Packet over SONET/SDH using ITU-T x.86 LAPS, and IEEE 802.17 RPR.

UNIT 6, "Multiservice SONET Platforms"
Cisco ONS 15000 family.- ONS 15454 MSPP, 15454 MSTP, and the 15454 SDH. Electrical and optical cards associated with the ONS 15454, E-Series Ethernet switch cards and the ML-Series Layer 2/3..

UNIT 7, "Ethernet, IP, and RPR over SONET and SDH"
Ethernet, IP, and RPR provisioning aspects of the ONS 15454 for SONET and SDH., SONET/SDH optical provisioning and the creation of Ethernet circuits over the optical layer. VRF and RPR provisioning.

References :

1. “Optical Network Design and Implementation (Networking Technology)”, by Vivek Alwayn, Cisco press
2. “Handbook of Fiber Optic Data Communication”, Third Edition: A Practical Guide to Optical Networking by Casimer DeCusatis

IT403 ADVANCE CLIENT-SERVER TECHNOLOGY

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

UNIT 1: Introduction to Client-server computing, Evolution of Corporate computing models from centralised to Distributed computing, Client –Server Models, Benefits & pitfalls of client-server computing.

UNIT 2: Introduction to Java, Classes & Interfaces, Inheritance, Exception Handling,Threads and Multithreaded programming, Packages, Collections

UNIT 3: NETWORKING Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming

UNIT 4: DATABASE NETWORKING The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Matadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP

UNIT 5: DISTRIBUTED OBJECTS The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Designing Client-server using RMI

UNIT 6: COMPONENT MODELS
Beans , Introduction to Enterprise Java Beans , session & entity beans , EJB Deployment , EJB transactional issues, Distributed Component models.
UNIT 7: SERVLETS
Overview, Servlet Lifecycle: init(), service(), destroy(), GenericServlet, ServletRequest and ServletResponse, HttpServlet, HttpServletRequest and HttpServletResponse : GET, POST, accessing parameters

TEXT BOOK:

1. Core JavaTM 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004

REFERENCE BOOKS:

1. Professional Java Programming by Brett Spell, WROX Publication

CE405 **Object Oriented Systems Development**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction: Review of the Traditional Methodologies, Advantages of Object Oriented Methodologies over Traditional Methodologies, Classes, Objects, Encapsulation, Association, Aggregation, Inheritance, Polymorphism, States and Transitions.

Visual Modelling using Unified Modelling Language (UML): What is Visual Modelling? Object Oriented Modelling, Introduction to Unified Modelling Language (UML): History of UML, Overview of UML – Capabilities, Usage of UML.

Introduction to Rational Rose CASE tool: Introduction – Importance of Rational Rose, Capabilities of Rational Rose Case Tool.

Unit-2: Introduction to Objectory Software Development Process: Introduction, Benefits, Phases and Iterations, Elaboration Stage, Construction Stage, Transition Stage.

Creating Use Case Diagrams: Actors and Use Cases, Use Case Relationships, Types of Relationships, Use Case Diagrams: Creating Main Use Case -,Relationships - , Additional Use Case - Diagrams in Rational Rose, Activity Diagrams Activities, Transitions, Decision Points, Swimlanes

Unit-3: Identifying Classes ,Packages and drawing a Class Diagram: State, Behaviour, Identity of Objects, Stereotypes and Classes, Creating and Documenting Classes in rational Rose, Packages, Drawing a Class Diagram Specifying Relationships : The Need of Defining Relationships, Association and Aggregation Relationships, Naming Relationships, Role Names, Multiplicity Indicators, Reflexive Relationships, Package Relationships, Inheritance, Finding Relationships, Creating Relationships in Rational Rose

Unit-4: Discovering Object Interactions: Documenting Scenarios using Interaction Diagrams, Types of Interaction Diagrams, Adding Behaviour and Structure: Representing Behaviour and Structure, Creating Attributes & operations and documenting them, Displaying attributes and operations, Association Classes, Analysing Object Behaviour: Modelling Dynamic Behaviour, States

Unit-5: Checking the Model: Making the Model Homogeneous, Combining Classes, Splitting Classes, Eliminating Classes, Consistency Checking, Scenario Walk-through,

Event Tracing, Documentation Review, Designing the System Architecture : The need for Architecture, The “4+1” view of Architecture, The Logical view, The Component View, The Process View, The Deployment View, The Use Case view.

Unit-6: The Iteration Planning Process: Benefits, Goals, Design the User Interface, Adding Design Classes, The Emergence of Patterns, Designing Relationships, Designing Attributes and Operations, Designing for Inheritance, Coding, Testing, and Documenting the Iteration.

Text Books:

- “UML User Guide”, Grady Booch, James Rumbaugh, Ivar Jacobson, 2000, Addison Wesley.
- Visual Modeling with Rational Rose 2000 and UMLBy Terry Quatrani Foreword by Grady Booch, 2000

Reference Books:

- “UML Reference Guide”, James Rumbaugh, Ivar Jacobson, Grady Booch, 2000, Addison Wesley.
- “The Objectory Software Development Process”, Ivar Jacobson, Grady Booch, James Rumbaugh, 1999, Addison Wesley.
- UML Distiled by Maxtin Fowler with Kendall Scott,2000 ,Second Edition
- Sams Teach Yourself “UML” In 24 Hours By Joseph Schmuller ,2000

CE407 Distributed Operating System

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction: Introduction To Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client – Server model ,Remote Procedure Calls and Group Communication.

Unit-2: Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection .

Unit-3: Processes and Processors in distributed systems: Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

Unit-4: Distributed file systems: Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Unit-5: Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Book:

- Distributed Operating System – Andrew S. Tanenbaum, PHI.

Elective-II

IT423 **ROUTING IN COMMUNICATION NETWORKS**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Circuit Switching Networks

Dynamic Alternative Routing- Dynamic Routing in Telephone Network - ATM networks with virtual paths - Statistical multiplexing and homogeneous sources , delay guarantees, No statistical multiplexing , heterogonous sources.

Packet Switching Networks

Distance vector Routing, Link State Routing, Inter domain Routing-Classless Interdomain routing (CIDR), Interior Gateway routing protocols (IGRP) - Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Exterior Gateway Routing Protocol (EGRP) - Border Gateway Protocol (BGP), Apple Talk Routing.

High Speed Networks

Routing in optical networks- Optical link networks- Single hop, multi hop optical networks, hybrid optical networks, photonic networks , Routing in the PLANET network-Packet level Routing - Call level Routing - Network infrastructure - Deflection Routing.- Topologies, Deflection routing Algorithms- Performance of routing algorithms on regular topologies - Deflection routing on time varying topologies, resequencing - unslotted operation.

Mobile Networks

Routing in Cellular Mobile Radio Communication networks- Network Architecture, Air interface functionality, Mobility management, Connectionless Data service for cellular systems, Mobility and Routing in Cellular Digital Packet Data (CDPD) network, Packet Radio Routing-DARPA packet radio network, Routing algorithms for small, medium and large sized packet radio networks.

Mobile Ad-Hoc Networks

Internet based mobile ad-hoc networking, Routing algorithms - Table-driven routing - Destination Sequenced Distance Vector (DSDV), Source initiated on-demand routing- Dynamic Source Routing (DSR), Ad-hoc On- demand Distance Vector (AODV), Hierarchical based routing- Cluster head Gateway Switch Routing (CGSR) and Temporally-Ordered Routing Algorithm (TORA).

References

1. M. Steen strub, Routing in Communication networks, Prentice Hall International, NewYork, 1995

2. Internetworking Technologies Handbook, 4 th Edition, Inc. Cisco Systems, ILSG Cisco Systems, 2003.

3. William Stallings, ISDN and Broadband ISDN with Frame Relay and ATM, PHI, New Delhi, 2004.
4. Behrouz A Forouzan, Data Communications and Networking , 3 rd Edition, TMH, 2004
5. William Stallings, High Speed Networks TCP/IP and ATM Design Principles, Prentice Hall International, New York, 1998.

CE417 **Natural Language Processing**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosody & natural languages.

Unit-2: Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

Unit-3: Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Unit-4: **S**emantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Unit-5: Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

Text Book:

- "Natural Language Understanding" James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

Reference Books:

- "Language as a cognitive process", Terry Winograd 1983, AW
- "Natural Language processing in prolog" G. Gazder, 1989, Addison Wesley.
- " Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

CE419 **Social and Professional Issues in IT**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Legal Issues: Introduction to legal concepts, Basic outline of Criminal and Civil Laws, Concepts relating to laws of Contract and Commercial Law, Substantive Legal Issues, Intellectual property Issues, Cyber crime, Data protection principles and implications of the European Union Data Protection Directive, Confidentiality and privacy, Intellectual property rights, Copyright and Industrial Property, Patents, Trade Marks and laws relating to designs, Software Protection and piracy, Dealing with Copyright, Originality, Exception to Copyright infringement, Employees and freelance programs, devices to overcome protection Software Licensing , Methods of licensing, Copyright and electronic publishing , Copyright problems posed by electronic publishing.

Unit-2: Multimedia, licensing and related issues: Protection of Databases, Trade marks and passing off, Internet related issues, Contract issues and Law, Basic understanding of the Types of Agreements in large computerization projects – Implementation Agreements, License Agreements, Maintenance agreements etc., Enforcement issues, dispute resolution, arbitration, legislative action,

Unit-3: Other Professional Issues: Duties of a professional, Duties to client, Duties to Employer, Duties to profession, Duties to society, Accountability for quality, timeliness and use of resources, Human relationships and change management, Avoiding computer misuse, Hacking, unauthorized access and types of Computer Crime, Introduction of Viruses, Fraud and types of Computer Fraud, Public interest and Social implications, Environmental protection, Health and safety issues, Privacy, Ethics and Codes of Professional Conduct, The need for professional ethics, Characteristics of professions, Integrity & Honesty, Competence, Professional development, judgment, knowledge of law, relations, standards, independence, Acting with responsibility, professional skill, comply with law, Confidentiality, due care, Contribute towards advancement of human welfare, Public interest, Public awareness, Basic human rights, Ethics and the Internet, Netiquette and Policy approaches, Professional relationships, Are computer professionals "Professionals", Conflicting responsibilities and misconduct, Codes of Ethics: Relationship between Code of ethics and professional conduct. Case study of some professional body such as Computer Society of India / BCS(UK).

Text Book:

- Professional Issues in Software Engineering (2nd edition.), Bott F. et al., 1995, UCL Press.

Reference Books:

- (Eds), The Responsible Software Engineer: Selected Readings in IT Professionalism, Myers C., Hall T. and Pitt D., 1997, Springer

* BCS code of conduct: http://www.bcs.org/docs/01100/1194/pdf/codeofc.pdf

- BCS Code of Practice: http://www1.bcs.org/docs/01100/1194/Cop.htm
- ACS code of Ethics http://203.58.197.209/acs/events_admin/static/national/pospaper/acs131.htm

CE421 **SOFTWARE TESTING**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit 1 Introduction Definition of testing, goals, psychology, model for testing, effective testing, limitations of testing, Importance of Testing.

Unit 2 Testing terminology and Methodology
Definition of Failure, faults or bug, error, incident, test case, test ware, life cycle of bug, bug effects, bug classification, test case design, testing methodology, development of test strategy, verification, validation, testing life cycle model, testing techniques, testing principles,Testing Metrices.

Unit 3 Verification and validationVerification activities, verification of requirements, verification of HL design, verification of data design, verification of architectural design, verification of UI design, verification of LL design, introduction to validation activities

Unit 4 Black Box testingBoundary value analysis, equivalence class portioning, state table based testing, decision table based, grappling, error guessing.

Unit 5 White Box testingLogic coverage criteria, basic path testing, graph matrices, loop testing, data flow testing, mutation testing

Unit 6 Static testingTypes of static testing, technical reviews, inspections, inspection process, structured walk through, walk through process, adv. Of static testing

Unit 7 Validation Testing Unit testing, drivers , stubs, integration testing, methods, effect of module coupling and cohesion, functional testing, system testing, recovery testing, security testing, stress testing, performance testing, usability testing

Unit 8 Test Automation and debugging
S/w measurement and testing, testing metrics, tools debugging, debugging techniques, design of practical test cases, reducing no. of test cases,

Text books:-

1. G.J Myers, The Art of Software Testing, John Wiley & Sons, 1979
2. Naresh Chauhan, Software Testing Principles and Practices, OXFORD University Press.

Elective-III

CE423 **Software Project Management**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

Unit-2: Stepwise Project planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, estimation techniques,COCOMO model, identifying activity risk, allocate resources, review/ publicize plan.

Unit-3: Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery. Albrecht function point analysis.

Unit-4: Activity planning & Risk Management: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.

Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values.

Unit-5: Resource allocation &Monitoring the control: Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.

Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

Unit-6: Managing contracts and people: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures.

Unit-7: Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, quality factors,ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality, software quality metrices.

Unit 8: Study of any Software Project Management software, Viz. Project 2000 or equivalent

Text Book:

- Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

Reference Books:

- Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH
- Software Project Management, Walker Royce, 1998, Addison Wesley.
- Project Management 2/c. Maylor
- Managing Global software Projects, Ramesh, 2001, TMH.

CE425 **Logic & Functional Programming**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: Procedural and non-procedural lang., prolog vs LISP, Applications of LISP & PROLOG in designing expert system.

Unit-2: Syntax of PROLOG, Lists, Operators, Arithmetic, Structures, Controlling Back Tracking.

Unit-3: Input and Output, built-in predicates, Operation on Data Structures, Advanced Tree Representation.

Unit-4: Prolog in Artificial Intelligence: writing programs for search techniques, Constraint logic programming, Knowledge representation and expert system, Expert System Shell.

Unit-5: Planning, Machine Learning, Inductive Logic Programming, Qualitative Reasoning, Language Processing, Game Playing, Meta Programming.

Text Book:

- Prolog Programming for Artificial Intelligence by Ivan Bratko, 2001, Pearson Edu.

Reference Books:

- Symbolic Computing with Lisp & PROLOG - by Mueller, JW, 1998
- Programming in turbo PROLOG by Lee Teft - PHI.

CE427 **Introduction to VLSI Design**

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit-1: MOS TECHNOLOGY AND CIRCUITS: MOS Technology and VLSI, Process parameters and considerations for BJT, MOS and CMOS, Electrical properties of MOS circuits and Device modeling.

Unit-2: MOS CIRCUIT DESIGN PROCESS: MOS Layers, Stick diagram, layout diagram, propagation delays, Examples of combinational logic design, scaling of MOS circuits.

Unit-3: DIGITAL CIRCUITS AND SYSTEMS: Programmable Logic Array (PLA) and Finite State Machines, design of ALUs, Memories and Registers.

Unit-4: ANALOG VLSI AND HIGH SPEED VLSI : Introduction to analog VLSI, Realisation of Neural Networks and Switched capacitor filters, Sub-micron technology and GaAs VLSI technology.

Unit-5: HARDWARE DESCRIPTION LANGUAGES : VHDL background and basic concepts, structural specifications of hardware design organization and parameterization.

Text Books:

- Modern VLSI Design by Wayne Wolf, 2nd Edition, PHI, 1998
- Basic VLSI Design Systems and Circuits by Douglas A. Pucknell and Kamran Eshraghian, PHI, 1993
-

Reference Books:

- Introduction to NMOS and CMOS VLSI System Design by Amar Mukherjee, PHI, 1986
- VLSI Design Techniques for Analog and digital Circuits by Randall L. Geiger and P.E. Allen, MGH, 1990
- Introduction to VLSI Design by Fabricious, MGH, 1990
- The designer's Guide to VHDL by Peter J. Aahenden, Harcourt Asia P. L. & Morgan Kauffman, 1996

CE401 Advanced Computer Architecture

Class Work: 40
Exam: 60
Total: 100
Duration of Exam: 3 Hrs

Note: Five questions will be set in all by the examiner. At most two internal choices can be provided.

Unit 1: Introduction: Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and memory, Virtual to real mapping. Basic Instruction Timing, Computer Architectural Classification schemes, System attributes to performance.

Unit 2: Program and network properties: Conditions of parallelism, Data and resource Dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain Size and latency, Program flow mechanisms, Control flow versus data flow, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

Unit–2: Time, Area And Instruction Sets: Time, cost-area, Phases of a processor project: A study, Instruction sets, Professor Evaluation Matrix

Unit-3: Cache Memory Notion: Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction.

Unit–4: Memory System Design: The physical memory; memory hierarchy Technology: hierarchical memory technology, inclusion, coherence and locality; models of simple processor memory interaction; Virtual memory technology: models, TLB, paging and segmentation, memory replacement policies.

Unit–5: Advanced processors: Vector Processors, multiprocessors and multicomputers, introduction to multi-vector and SIMD computers, Advanced processor technology, Instruction-set Architectures, CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors.

Text Book:

- Advance computer architecture by Kai Hwang , TMH, ed 2001.
- Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.