COCHIN UNIVERSITY OF SCIENCE & TECHNOLOGY

Scheme for I to VIII

B.TECH COMPUTER SCIENCE & ENGINEERING

(2006 Admission onwards)

B.TECH COMPUTER SCIENCE & ENGINEERING

NB: ***For all practicals from semester I & II to semester VII, 50% weightage is to be given for continuous evaluation and 50% for end semester examination***

Semester I & II (Common to all branches)

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CE/CS/EB/EC/EE/ EI/IT/ME/SE **101**	Engineering Mathematics I	3		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **102**	Engineering Physics	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **103**	Engineering Chemistry	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **104**	Engineering Mechanics	3	1	50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **105**	Engineering Graphics	1	3	50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **106**	Basic Civil & Mechanical Engineering	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **107**	Basic Electrical Engineering & Electronics	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **108**	Computer Programming	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **109**	Technical Communication & Social Sciences	3*		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE **110**	Computer Programming Lab		3	100		100
CE/CS/EB/EC/EE/ EI/IT/ME/SE **111**	Electrical & Mechanical Workshops		3	100		100
	Total	**20**	**10**	**650**	**900**	**1550**

*** 1 hour/week for environmental studies**

Semester III

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CE/CS/EB/EC/EE/ EI/IT/ME/SE **301**	Engineering Mathematics II	4		50	100	150
CS **302**	Logic Design	4		50	100	150
CS/IT **303**	Discrete Computational structures	4		50	100	150
CS/IT **304**	Object Oriented Programming	4		50	100	150
CS **305**	Principles of Programming Languages	4		50	100	150
CS/EB/EE **306**	Electronic devices and Circuits	4		50	100	150
CS/EE **307**	Electronics Circuits Laboratory	-	3	100		100
CS/IT **308**	Object Oriented Programming Lab	-	3	100		100
	Total	**24**	**6**	**500**	**600**	**1100**

Semester IV

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CE/CS/EB/EC/EE/ EI/ IT/ME/SE **401**	Engineering Mathematics III	4		50	100	150
CS/EB/EC/EI **402**	Microprocessors.	4		50	100	150
CS **403**	Computer Architecture & Organization	4		50	100	150
CS/IT **404**	Automata, Languages and Computation	4		50	100	150
CS/IT **405**	Data Structures and Algorithms	4		50	100	150
CS/IT **406**	Data Communication	4		50	100	150
CS/EB/EC/EE **407**	Digital Electronics Laboratory	-	3	100		100
CS/IT **408**	Data structures Lab	-	3	100		100
	Total	**24**	**6**	**500**	**600**	**1100**

Semester V

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CE/CS/EB/EC/EE/EI/IT/ME/SE **501**	Engineering Mathematics IV	4		50	100	150
CS/IT **502**	Systems Programming	4		50	100	150
CS/IT **503**	Software Engineering	4		50	100	150
CS **504**	Computer Graphics	4		50	100	150
CS/IT **505**	Database Management System	4		50	100	150
CS/EB **506**	Microprocessor based System Design	4		50	100	150
CS/EB/EC/EI **507**	Microprocessor Lab	-	3	100		100
CS**508**	Computer Graphics Lab	-	3	100		100
	Total	**24**	**6**	**500**	**600**	**1100**

Semester VI

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CS **601**	Compiler Construction	4		50	100	150
CS /EE **602**	Digital Signal Processing	4		50	100	150
CS/IT **603**	Operating Systems	4		50	100	150
CS/IT **604**	Analysis and Design of Algorithms	4		50	100	150
CS/EB/EC/EI **605**	Control Systems Engineering	4		50	100	150
CS/IT **606**	Computer networks	4		50	100	150
CS **607**	System Programming and Hardware Lab	-	3	100		100
CS **608**	Mini Project	-	3	100		100
	Total	**24**	**6**	**500**	**600**	**1100**

Semester VII

Course Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CS/EB/EC/EE/EI/ IT **701**	Industrial Organization & Management	4		50	100	150
CS **702**	Advanced Architecture and Parallel Processing	4		50	100	150
CS/IT **703**	Advanced Computer Networks	4		50	100	150
CS/IT **704**	Distributed Computing	4		50	100	150
CS**705**	Elective I	4		50	100	150
CS **706**	Language processor Lab	-	3	100		100
CS **707**	Network and Operating Systems Lab	-	3	100		100
CS **708**	Seminar	-	2	50		50
CS **709**	Project Design	-	2	50		50
	Total	**20**	**10**	**550**	**500**	**1050**

ELECTIVE I:

CS 705 A: Embedded Systems

CS/IT 705 B: Information Retrieval

CS/ EB/IT 705 C: Artificial Neural Networks

CS 705 D: Web Commerce Technologies

Semester VIII

Subject Code	Subject Name	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
CS 801	Security in Computing	4		50	100	150
CS 802	Artificial Intelligence	4		50	100	150
CS 803	Object Oriented Modeling & Design	4		50	100	150
CS 804	Elective II	4		50	100	150
CS 805	Project Work		14	300		300
CS 806	Viva-voce				100	100
Total		**16**	**14**	**500**	**500**	**1000**
Grand Total				**3700**	**4300**	**8000**

ELECTIVE II:

CS/EC/EE/EI 804 A: Digital Image Processing

CS/EB/EC/IT 804 B: Bioinformatics

CS 804 C: Software Architecture

CS/IT 804 D: Mobile Computing

CE/CS/EB/EC/EE/EI/IT/ME/SE 101 ENGINEERING MATHEMATICS I

Module 1

Ordinary differential equations:

First order differential equations-Methods of solution and Simple applications-
Linear differential equations of higher orders with constant co-efficients-Methods of solution of these equations. Cauchy's Linear differential equations. Simultaneous linear differential equations- Simple applications of linear differential equations in engineering problems –Electrical Circuits, Mechanical Systems

Module 2

Infinite series : Integral test, comparison test, ratio test, Cauchy's root test, Raabe's test, seies of positive and negative terms, concept of absolute convergence, alternating series, Leibniz test(No proofs for any of the above tests)

Power series : Internal of convergence of power series, Taylor and Maclaurin series of functions, Leibniz formula for the nth derivative of the product of two functions (No proof),use of Leibniz formula for the determination of co-efficients of the power series.

Module 3

Partial differentiation: Partial differentiation-Concept of partial derivative - Chain rule- Total derivative- Euler's theorem for homogeneous functions, Differentials and their applications in errors and approximations, Jacobians - Maxima minima of functions of two variables(Proof of the result not required)-Simple applications.

Taylors series expansion for a function on two variables-Simple problems

Co-ordinate systems: Rectangular co-ordinates-Polar co-ordinates-In plane and in Space-Cylindrical polar co-ordinates-Spherical polar co-ordinates.

Module 4

Integral calculas:

Application of definite integrals: Area, Volume, Arc length, Surface area.

Improper Integrals-Beta function-Gamma function

Multiple integrals : Evaluation of double integrals-Change of order of integration. Evaluation of triple integrals-Change of Variables in integrals.

Applications of multiple integrals Plane Area, Surface area &Volumes of solids

Text Books:

1. Engineering mathematics -Vol1:S.S.Sastry, PHI publishers
2. Erwin Kreyzig, Wiley Easter Advanced Engineering Mathematics:,**

References:

1. Mathematical Techniques: Oxford University Press
2. T.Veerarajan Engineering Mathematics:, TMGH Publishers, *
3. B.S.Grewal ,Higher Engineering Mathematics:, Khanna Publishers,*

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/EI/ME/IT/SE 102: ENGINEERING PHYSICS

Module 1

Interference of light – Michelson interferometer – Applications-Interference in thin films – Antireflection coatings – Interference filters – Fringes produced by air wedge – Testing of flat surfaces- Diffraction of light –Zone plate - Plane diffraction grating - Reflection and transmission gratings – Determination of wavelength of light – Dispersive and resolving powers - Polarization of light – Double refraction – Nicol's prism – Quarter and half wave plates – Elliptically and circularly polarized light – Optical activity – Specific rotation – Half-shade polarimeter – Applications of polarized light.

Module 2

Lasers and Holography – Properties of laser light – Coherence of light – Principles of laser action – Population inversion – Optical pumping – Metastable states – Conditions for laser action – Types of lasers – Helium-Neon, Ruby and Semiconductor lasers – Applications of lasers – Principles of holography – Recording and Reconstruction of holograms – Applications of holography- Fiber optics – Light transmission through optical fiber – Numerical aperture – Multi and single mode fibers – Step index and graded index fibers – Fiber drawing – Fiber optic communication (basic ideas) – Ultrasonics – Generation of ultrasonic waves – Applications of Ultrasound.

Module 3

Quantum mechanics – Heisenberg's uncertainty principle - Experimental illustrations – Quantum mechanical wave equation – Time independent Schrodinger equation – Physical significance of wave function – Properties of the wave function – Solution of Schrodinger equation - Atomic and nuclear physics – The Vector atom model – Quantization of orbital angular momentum – Electron spin - Magnetic moment of orbital electron – Pauli's exclusion principle– Zeeman effect – Stark effect – Raman effect. Nuclear physics – Nuclear forces – Properties of the nucleus - Nuclear reactions-Nuclear reaction cross section-Artificial radioactivity – Nuclear reactors – Nuclear fusion – Thermonuclear reactions-Controlled thermonuclear reactions.

Module 4

X-rays – Production of X-rays – Origin of X-rays and X-ray spectra – Moseley's law – Properties of X-rays – Applications of X-rays – Diffraction of X-rays by crystals – Bragg's law – Crystallography – Unit cell – Seven crystal systems – Bravais space lattices - Packing factor – Lattice planes and Miller indices – Energy bands in solids – Conductors, semiconductors and insulators – Intrinsic and extrinsic semiconductors – Conductivity of semiconductors – Fermi level - Applications of semiconductors – p-n junctions – solar cells – Hall effect and its applications – Superconductivity – Superconducting transition – The Meissner effect – Type I and Type II superconductors – Isotope effect - High temperature superconductors – Josephson effect – SQUIDS – Applications of superconductors

Text and Reference Books :

1. Jacob Philip – A text book of Engineering Physics, Educational Publishers and Distributors 2002
2. A.S. Vasudeva – Modern Engineering Physics, S. Chand & Co.,*
3. M.R. Sreenivasan – Physics for Engineers – New Age International,*

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/ CS/EB/EC/EE/EI/ME/IT/SE 103 ENGINEERING CHEMISTRY

Module 1

Solid state chemistry: Fundamentals, Bonding in solids, Born-Haber cycle, Point defects, Methods to improve reactivity of solids, Free electron theory, Band theory, Fermi level in semiconductors, Molecular field theory of magnetic materials, Conventional and organic superconductors, High temperature superconductors, Liquid crystals, Applications. Solid surface characterisation: Electron spectroscopy for chemical analysis, Chemical shift, BET isotherm, Thermodynamics of adsorption.

Module 2

Electrochemistry: Fundamentals, Electrode potentials, Types of electrodes, Salt bridge, emf measurement, Concentration cells, Acids and bases, Buffer solutions, pH measurements, Polarisation, Overvoltage. Power generation: Secondary cells, Fuel cells, Photovoltaic effect, Solar cells. Corrosion: Different forms of corrosion, Prevention of corrosion.

Chemical Kinetics: reaction rate, rate constant, rate law, reaction order, first order, second order, pseudo-first order reactions, integrated rate laws, half-life of a reaction and its relation to rate constant. Molecularity, simple unimolecular and bimolecular reactions. Arrhenius equation. Fast reactions – flash photolysis, flow techniques and relaxation methods.

Module 3

Chemical Thermodynamics: Fundamentals, Molecular interpretation of internal energy, enthalpy and entropy, Heat of reaction, Kirchhof.s equation, Trouton.s rule, Entropy changes accompanying different processes, Nernst heat theorem, Third-law. Free energy: Dependence on pressure and temperature, Gibbs-Helmholtz equation, Free energy changes and equilibrium constant, Chemical potential, Fugacity, Thermodynamics of biochemical reactions.

Module 4

Engineering materials: Industrial polymers-polymerization techniques, structure-property relationships, polymer additives, polymer processing methods (extrusion, injection, compression, transfer and blow molding methods). Nanomaterials: definition, classification and applications. Nanometals and nanoceramics – examples and properties.

Lubricants: classification, functions and properties. Mechanism of lubrication.

Refractories: classification and properties. Portland cement, lime and plaster of Paris – manufacture, setting and hardening.

Chemistry of optical fibres, fullerenes and organoelectronic materials (introduction only).

Text Books:

1. Peter Atkins and Julio de Paula *Elements of Physical Chemistry*, Oxford University Press, 2005
2. Shashi Chawla, *A Text Book of Engineering Chemistry* (3rd Edn.).; Dhanpat Rai & Co, New Delhi, 2003.

References

1. Atkins, P.W., *Physical Chemistry*, Oxford University Press, UK, 1998
2. Bhatnagar, M. S., *Textbook of Pure & Applied Physical Chemistry*, A. H. Wheeler & Co,NewDelhi, 1999.
3. Geoffrey Ozin, Andre Arsenault *Nanochemistry: A Chemical Approach to Nanomaterials*.; Royal Society of Chemistry, U.K. 2005.

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/EI/IT/ME/SE 104 ENGINEERING MECHANICS

A) STATICS

Module 1

Concurrent forces in a plane: Principles of statics. Composition and resolution of forces. Equilibrium of concurrent forces in a plane. Method of projection. Method of moments. Friction.

Parallel forces in a plane: Two parallel forces. General case of parallel forces in a plane. Centre of parallel forces and centre of gravity, Pappus theorems, centroids of composite plane figures and curves. Distributed forces in a plane.

Module 2

Properties of areas: . Moment of inertia of a plane figure with respect to an axis in its plane. Polar moment of inertia. Product of inertia. Principal axes. Mass moment of inertia of material bodies.

General case of forces in a plane: Composition of forces in a plane. Equilibrium of forces in a plane. Plane trusses - Method of joints. Method of sections. Plane frames : Method of members.

Principle of virtual work: Equilibrium of ideal systems, stable and unstable equilibrium.

B) DYNAMICS

Module 3

Rectilinear translation: Kinematics of rectilinear motion. Differential equation of rectilinear motion. Motion of a particle acted upon by a constant force, by a force as a function of time and by a force proportional to displacement. Simple harmonic motion. D'Alembert's principle. Momentum and impulse. Work and energy, ideal systems, conservation of energy. Impact.

Module 4

Curvilinear translation: Kinematics of curvilinear translation. Differential equations of motion. Motion of a projectile. D'Alembert's principle in curvilinear motion. Moment of momentum. Work and energy in curvilinear motion.

Rotation of a rigid body: Kinematics of rotation. Equation of motion of a rigid body rotating about a fixed axis. Rotation under the action of a constant moment. Compound pendulum. General case of moment proportional to the angle of rotation. D'Alemberts principle of rotation. Resultant inertia force in rotation. Principle of angular momentum in rotation. Energy equation for rotating bodies.

Text Book & References :

1. Timoshenko and Young -Engineering Mechanics - McGraw Hill Book Company,*
2. Beer F. P. & Johnston E. R. - Tata McGraw Hill-Mechanics for Engineers (Vol. 1-Statics and Vol.2 -Dynamics) -. **
3. Merriam H. L. & Kraige L. G. - John Wiley and Sons, Engineering Mechanics (Vol. 1-Statics and Vol.2 -Dynamics) - **
4. Biju N- Engineering mechanics- Educational Publishers.*

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/EI/IT/ME/SE 105 ENGINEERING GRAPHICS

Module 1

Introduction to engineering graphics.-Drawing instruments and their use, familiarisation with current Indian Standard Code of Practice for general engineering drawing.
Scales- plain scale , vernier scale, diagonal scale.
Conic sections- Construction of ellipse, parabola, hyperbola - construction of cycloid, involute, archimedian spiral and logarithmic spiral- drawing tangents and normals to these curves.

Module 2

Introduction to orthographic projections- plane of projection- principles of first angle and third angle projections, projection of points in different quadrants.
Orthographic projection of straight lines parallel to one plane and inclined to the other plane- straight lines inclined to both the planes- true length and inclination of lines with reference planes- traces of lines.
Projection of plane laminae of geometrical shapes in oblique positions.

Module 3

Projection of polyhedra and solids of revolution- frustum, projection of solids with axis parallel to one plane and parallel or perpendicular to other plane- projection of solids with axis inclined to both the planes- projection of solids on auxiliary planes.
Section of solids by planes inclined to horizontal or vertical planes- true shape of sections.

Module 4

Development of surface of cubes, prisms, cylinders, pyramids and cones
Intersection of surfaces- methods of determining lines of intersection - intersection of prism in prism and cylinder in cylinder.

Module 5

Introduction to isometric projection- isometric scales, isometric views- isometric projections of prisms, pyramids, cylinders, cones and spheres.
Introduction to perspective projections : visual ray method and vanishing point method- perspective of circles- perspective views of prisms and pyramids.

Text Books & References:

1. P.I.Varghese & K.C. John -Engineering Graphics- JET Publishers **
2. N.D.Bhat -Elementary engineering drawing- Charotar publishing house
3. P.S.Gill ,Geometric drawing, B.D Kataria &sons Ludhiana *
4. P I Varghese- Engineering Graphics VIP Publishers.

University Examination Pattern

Answer 5 Questions choosing one from each module-20 marks each

CE/CS/EB/EC/EE/EI/IT/ME/SE 106
BASIC CIVIL AND MECHANICAL ENGINEERING

(A) CIVIL ENGINEERING

Module 1

Materials: *Cement* - varieties and grade of cement and its uses. *Steel*- types of steel for reinforcement bars, steel structural sections. *Brick*- varieties and strength , tests on bricks. *Aggregates*- types & requirements of good aggregates. *Concrete*- grades of concrete as per IS code, water cement ratio, workability, mixing, batching, placing, compaction and curing.
Construction : *Foundation*- types of foundations- isolated footing, combined footing, raft, pile & well foundations,

Module 2

Super structure : Brick masonry, English bond and Flemish bond , Stone masonry, Random rubble masonry. *Roofing*- Steel trusses, roofing for industrial buildings
Surveying: Principles, instruments, ranging and chaining of survey lines, errors in chaining, field work, field book, selection of survey stations, reconnaissance ,,
Levelling : Levelling instruments, different types, temporary adjustments, mean sea level, reduced level of point, booking of field notes, reduction of levels by height of collimation method.

Text Books & References :

1. Rangawala - Engineering materials ,**
2. Punmia Building construction , **
3. N.K.R. Murthy, A Text book of building construction, **
4. Roy M Thomas, Fundamentals of Civil Engineering- Educational Publishers. *
5. Jha & Sinha - A Text book of building construction,
6. T P Kanetkar, Surveying & Levelling,*
7. Hussain - Surveying & Levelling * :

(B) MECHANICAL ENGINEERING

Module 3

Thermodynamics: thermodynamic systems - open, closed and isolated systems, equilibrium state. of a system, property' and state, process, cycle, work, Zeroth law of thermodynamics-concept of temperature, temperature scales. First law - internal energy, enthalpy. Second law - Kelvin-Plank and Claussius statements, Carnot Cycle.

Refrigeration and Air conditioning: Vapour compression and vapour absorption refrigeration systems, summer and winter Air conditioning, Comfort and industrial Air conditioning.

Elementary ideas of simple reaction and impulse turbines, compounding of turbines.

Module 4

Internal Combustion Engines: working of two stroke and four stroke Petrol and Diesel engines, simple Carburettor, ignition system, fuel pump, fuel injector, cooling system, lubricating system.

Transmission of Power: Belt drives (open and closed), chain drives.

Metal fabrication: Welding - Arc, gas, resistance welding, Welding defects, Soldering, Brazing

Text Books & References:

1. P.K.Nag - Engineering Thermodynamics ,**
2. D.B. Spalding & E.H.Cole- Engineering Thermodynamics *
3. Van Wylon- Engineering Thermodynamics,*
5. J.P.Holman - Thermodynamics,*
6. Rogowsky, Tata McGraw Hill - Elements of Internal Combustion Engines *
7. Gill, Smith & Ziurys Fundamentals of Internal Combustion Engines , Oxford & IBH *
8. Stoecker Tata McGraw Hill - Refrigeration and Air Conditioning, *

Type of questions for University Examination

PartA -

Question 1- 4 short answer questions of 5 marks each. 2 questions from each module
Question 2-3 – There will be two choices from each module .Answer one question from each module of 15 marks
Part B
Question 4-4 short answer questions of 5 marks each. 2 questions from each module
Question 5-6 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/ EI/IT/ME/SE 107 BASIC ELECTRICAL ENGINEERING& ELECTRONICS

(A) ELECTRICAL ENGINEERING

Module 1

Basic principles of Electric circuits: Review of Ohms law - Definition of resistance, current, voltage and power - Series and parallel circuits- constant voltage source and constant current source.
Network Theorems: Kirchoff's laws- Network analysis by Maxwell's circulation currents - Thevenin's theorem - Superposition theorem -Norton's theorem - Simple illustrative problems on network theorems.
Review of electrostatics - Coulomb's Law- Electric field strength and Electric flux density- capacitance.

Module 2

Review of electromagnetic induction -Faraday's Law- Lenz's Law - mutually induced emf. Magnetic circuits - magnetic field of a coil - Ampere turns calculation - magnetic flux - flux density - field strength.
Measuring instruments: Working principle of galvanometer, Ammeter, Voltmeter, watt meter & energy meter.
AC fundamentals: Generation of alternating voltage and current - equations of sinusoidal voltage and current - wave form, cycle frequency, time period, amplitude, phase difference, rms value, average value, power factor & form factor. Vector diagram - addition and subtraction of vectors- sine waves in phase and out of phase. AC circuits: RC, RL, RLC circuits-series and parallel - current, voltage and power relationships. Poly phase circuits: vector representation - phase sequence - star and delta connections.

(B) ELECTRONICS

Module 3

Passive components: Resistor – Capacitor - Inductor - Color coding. Transformer- different types, construction.
Semiconductors: Energy band diagram – intrinsic & extrinsic semi conductors, doping - PN junction – Diodes, Zener diodes- Characteristics - Application of diodes. Rectifiers- Half wave, full wave and Bridge rectifiers – Ripple factor and regulation.
Transistors: - PNP and NPN transistors - theory of operation - Transistor configurations - characteristics - comparison.
Special semiconductor devices - FET - SCR - LED - LCD – V-I characteristics, applications.

Module 4

Fundamentals of Instrumentation: Transducers - Definition - Classification – Active & passive - Transducer for position, pressure, velocity, vibration and temperature measurements.
CRO – principle of operation - measurement of amplitude, frequency and phase.
Fundamentals of Communication: Analog communication - concept of modulation, demodulation. Types: AM - FM -PM- Block diagram of general communication system -Basic concepts of digital communication - Block diagram.

Text Book:

1. B. L. Theraja - Basic Electronics – Solid State –, S. Chand & Co.*
2. Leonard S. Bobrow - Fundamentals of Electrical Engineering –Oxford University Press.*

Further References:

1. Edward Hughes - Electrical Technology :, Addison Wesley Publication*
2. G.K. Mithal & Ravi Mittal - Electronic Devices & Circuits , Khanna Publishers, *

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/E1/IT/ME/SE 108 COMPUTER PROGRAMMING

Module 1

Introduction to programming in C: Fundamental data types- integer, floating point, and enumerated data types, typedef Expressions – arithmetic, relational and logic operators, Type conversion – simple and compound statement, Access to standard library, standard I/O-getchar, putchar, Formatted **I/O**, scanf, printf, error handling, line input and out put, control structures, selection statement, **IF, SWITCH, WHILE, DO WHILE, FOR, BREAK, CONTINUE, GOTO, RETURN** statements.

Module 2

Functions: Declarations and functions, parameter passing mechanism, storage classes-scope, visibility, and life time of variables, AUTO, EXTERN, STATIC and REGISTER modifiers, Recursion.

Module 3

Arrays : Single and multi dimensional arrays, sorting, selection sort, search-linear search and binary search, Structures and union.

Module 4

Pointers: Pointers and addresses, pointer arrays, function returning pointers, pointers to function, pointer arithmetic,. pointers to structures, array of structures, preprocessor directive, command line arguments

Text Book

1. Mullish & Cooper The Spirit of C An introduction to Modern programming Jaico Publication 1988
2. B.S. Gotfried (Schaum series, TMH)- Programming in C, *

References:

1. Pradeep Dey and Manas Ghosh,"Computer Fundamentals and Programming in C", Oxford 2006
2. Varghese Paul- Computer Fundamentals,* EPD,Kochi
3. Brian W. Kernighan and Dennis M.Richie,"The C Programming Language" PHI,2nd ed.,

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CE/CS/EB/EC/EE/EI/ /IT/ ME /SE 109
TECHNICAL COMMUNICATION AND SOCIAL SCIENCES
(Module IV Environmental Studies : 1 hour per week
Other modules : 2 hours per week)

PART - A TECHNICAL COMMUNICATION

Module 1 (25 hours)

Oral Communication: starting and ending a conversation; telling and asking people to do things; expressing opinions and ideas, decisions and intentions, offers and invitations, feelings, right and wrong, numbers and money.
Purpose and audience; dealing with customers and clients; face-to-face discussions; meetings and attending meetings; checking understanding; raising questions; giving and receiving feedback; using body language; leading and directing discussions; concluding discussions; using graphics in oral presentations

Reading Comprehension and reference skills: skimming and scanning; factual and inferential comprehension; prediction; guessing meaning of words from context; word reference; comprehending graphics in technical writing.
Reading strategies; reading speed; reading between the lines for hidden meaning; interpreting graphics; using a dictionary; using an index; using a contents list to find information; choosing the right reference source.

Module 2 (20 hours)

Written Communication: note making and note taking; summarising; notes and memos; developing notes into text; organisation of ideas: cohesion and coherence; paragraph writing: ordering information in space and time; short essays: description and argument; comparison and contrast; illustration; using graphics in writing: tables and charts; diagrams and flow-charts; maps, plans and graphs.
Spelling rules and tips; writing a rough draft; editing and proof reading; writing the final draft; styling text; filling in complex forms; standard letters; CV; writing a report; writing leaflets and brochures; writing references; essay writing: expository writing; description of processes and products; classification; the instructional process; arguments and presentation of arguments; narrating events chronologically.

PART - B SOCIAL SCIENCES

Module 3 (15 hours)

Science, Technology and Ethics

Impact of science and technology on the development of modern civilization . The philosophy of modern science – scientific determinism – uncertainity principle. Relevance of scientific temper. Science and religion. Science and technology in developing nations. Technological advances of modern India. Intermediate and appropriate technology. Development of technical education in India.
Senses of Engineering Ethics – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professional ideals and virtues - Attributes of an ethical personality – Theories about right action – Self interest.
Responsibilities and Rights of engineers – Collegiality and Loyalty – Respect for authority – Collective bargaining – Confidentiality – Conflicts of interest – Professional rights.

Module 4

Environmental Studies : **(30 hours)**

Natural resources – issues related to the use and over exploitation of forest resources , water resources, mineral resources, food resources and energy resources – role of an individual in conservation of natural resources – equitable use of resources for sustainable life styles.
Concept of an ecosystem – structure and function – energy flow in the ecosystem – ecological succession - food chains, food webs and ecological pyramids – structure and functions of a forest ecosystem and an aquatic eco system.
Definition of biodiversity – genetic, species and ecosystem diversity – biogeographical classification of India – Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
Causes, effects and control measures of air pollution, water pollution, soil pollution , noise pollution, marine pollution, thermal pollution and nuclear hazards – Causes, effects and control measures of urban

and industrial solid wastes –Role of an individual in prevention of pollution - An overview of the various environmental legislations in India – Issues involved in enforcement of environmental legislation.
The concept of sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, water shed management – Resettlement and rehabilitation of people ; its problems and concerns - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust – Population growth and problems of population explosion – Environmental ethics : issues and possible solutions..

Text Books:

Meenakshi Raman and Sangeetha Sharma	*Technical Communication : Principles and Practice, Oxford University Press, 2004*
Rajagopalan. R	*Environmental Studies : From Crisis to Cure*, Oxford University Press, 2005
Jayashree Suresh and B.S. Raghavan	*Professional Ethics*, S. Chand & Company Ltd, 2005.
WC Dampier	*History of Science*, Cambridge University Press.

References:

Adrian Doff & Christopher Jones,	*Language in Use* . Upper intermediate, self-study workbook & classroom book, Cambridge University Press,2000.
Krishna Mohan & Meenakshi Raman,	*Effective English Communication* ,Tata Mc-Graw Hill,2000.
Edmund D. Seebaur & Robert L. Barry	*Fundamentals of Ethics for Scientists and Engineers,* Oxford University Press, 2001
Krishna Mohan & Meera Banerji,	*Developing Communication Skills* Mac Millan India Ltd,2000.
Rajendra Pal & JS Korlahalli	*Essentials of business communication*, S. Chand & Company Ltd **
Sarah Freeman,	*Study Strategies*, Orient Longman, 1978.*
Meenambal T , Uma R M and K Murali	*Principles of Environmental Science and Engineering*, S. Chand & Company Ltd, 2005

University Examination pattern

The question paper will have two parts. Part A (Technical Communication) will cover Modules I, II and will have a weightage of 50 marks. Part B (Social Sciences) will cover Module III and Module IV (Environmental Studies) and will have a weightage of 50 marks. Part A and Part B will have to be answered in separate answer books.

Part A

University examination pattern
Q I - 4 short type questions of 5 marks, 2 each from module I and II
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one

Part B

University examination pattern
Q I - 5 short type questions of 4 marks, 2 from module III and 3 from module IV
Q II - 2 questions A and B of 10 marks from module III with choice to answer any one
Q III - 2 questions A and B of 20 marks from module IV with choice to answer any one

CE/CS/EB/EC/EE/EI/ IT/ ME/SE 110
COMPUTER PROGRAMMING LABORATORY

1. Study of OS commands. General introduction to application packages.
2. Programming using C control structures & pointers.
3. Searching & sorting
4. Creation and use of databases in a suitable database package
5. Programming exercises in C.

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CE/CS/EB/EC/EE/EI/ IT/ ME/SE 111
ELECTRICAL AND MECHANICALWORKSHOPS

ELECTRICAL WORKSHOP

1. One lamp controlled by one switch
2. Series and parallel connections of lamps.
3. Stair case wiring.
4. Hospital Wiring.
5. Godown wiring.
6. Fluroscent lamp.
7. Connection of plug socket.
8. Different kinds of joints.
9. Transformer winding.
10. Soldering practice.
11. Familiarisation of CRO.

MECHANICAL WORK SHOP

1. Fitting Shop.
2. Sheet Metal Shop
3. Foundry Shop
4. Welding Shop
5. Carpentry Shop
   (Preliminary exercises for beginners in all shops. Specific models may be designed by the teachers.)

Introduction to the use of concrete mix.

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

EB/EC/EE/EI/CE/CS/IT/ME/SE 301 ENGINEERING MATHEMATICS II

Module 1

Matrices and Vector spaces: Rank of matrix, Echelon and normal form, Solutions of linear systems of algebraic equations, Eigen values and Eigen vectors, Cayley- Hamilton theorem (no proof). Vector Spaces- Subspaces,-Linear Independence of vectors-Linear span-Dimension and Basis. Linear transformations.

Module 2

Fourier series and Fourier integrals: Fourier series of Periodic functions-Euler formulae for Fourier coefficients- functions having period 2π , arbitrary period- even and odd functions-half range expansions, Fourier integral, Fourier cosine and sine transformations, linearity property, transform of derivatives, convolution theorem (no proof)

Module 3

Laplace transforms: Linearity property, transforms of elementary functions, Laplace transforms of derivatives and integrals, differentiation and integration of transforms, convolution theorm (no proof), use of Laplace transforms in the solution of initial value problems, unit step function, impulse function - transform of step functions, transforms of periodic functions.

Module 4

Vector calculus : Scalar and Vector point functions-Gradient and directional derivative of a scalar point functions.- Divergence and Curl of a vector point functions- their physical meanings.

Evaluation of line integral, surface integral and volume integrals, Gauss's divergence theorem,. Stoke's theorem (No Proof of these theorem), conservative force fields, scalar potential.

Text books:

1. R.K. Jain, S.R.K Iyengar: Advanced Engineering Mathematics, Narosa publishers.1991
2. C.R. Wilie & L.C. Barrett: Advanced Engineering Mathematics, MGH Co.

References

1. Larry C Andrews, Ronald C Philips: Mathematical Techniques for Engineers & Scientists, PHI
2. M.C. Potter, J.L. Goldberg: Advanced Engineering Mathematics, Oxford university press
3. B. S. Grewal: Higher Engineering Mathematics, Khanna publishers,1986

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 302 LOGIC DESIGN

Module 1

Number Systems and codes: Binary ,Octal and Hexa decimal number Systems-Binary arithematic ,binary code,Excess-3 code, Gray error detection and correction.

Boolean Algebra: Poslulates and theorems, representation of switching functions –SOP and POS forms –Karnaugh map representation –Minimization using K-maps.

Module 2

Design of combinational circuits:-Tabular minimization:- Design of single output and muti-output functions-Design using AND,OR,NOT ,NAND NOR and EX-OR gates, Logic circuits from Boolean Expressions. Design using MSI and LSI devices-Digital Multiplexer /Selector Decoder. Demultiplexer –Design of 4 bit adder, Carry look ahead adder –BCD Convertor,Logic implementation using ROM,PAL and PLA.

Module 3

Introduction to Sequential Ckts: combinational Versus sequential Circuits, Asymchronous Versus Synchronous circuits-Memory elements and their Excitation function-Tff, Dff, RSff, JK ffs and their excitation requirements –Design of Sequential Circuits- Shift Registers, Counters –Synchronous and Asynchronous counters, Up—Down counters, Modular Counter, Ring Counter, Johnson counter ,Analysis of Sequential circuits-State table and Diagrams.

Module 4

Logic Families: RTL ,DTL ,TTL,CMOS –Tristate logic –Specification and transfer characteristics of basic TTL interfaces,-Standard logic levels-Current and voltage parameters-fan in and fan out –Propagation delay, integrated circuit modules, noise consideration-Interfacing of CMOS to TTL and interfacing of TTL to CMOS.

Text Book:

1. Yarbrough, “Digital Logic Apllications And Design” , Thomson Learning, India

References:

1. Taub & Schilling ,”Digital Integrated Electronics”, Mc Graw Hill
2. Samuel C Lee ,”Digital Circuits and logic Design”,Precentice Hall
3. A p Malvino , “ Digital Computer Electronics “, Tata Mc Graw Hill
4. Morris Miller ,”Design with TTL integrated Circuit”, Mc Graw hill
5. Peatman, ”Digital Hardware Design “,”, Mc Graw Hill
6. Ronald J Tocci ,”Digital Systems ,Principles and Applications”, Prentice Hall
7. Lloyd ,”Digital Fundamentals “, universal , N .Delhi
8. Mercins , “Switching Circuits “, Prentice Hall
9. MOS-LSI Circuits , Publication of Texas Instruments
10. Douglas v hall ,” Digital Circuits and Systems “, Mc Graw Hill
11. R P Jain , Principles of Digital Electronics
12. Mike Toolay, “Electronic Circuits – Fundamentals and Applications”, Elsevier, New Delhi

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 303 DISCRETE COMPUTATIONAL STRUCTURES

Module 1

Logics and Proofs ,propositions, conditional propositions and logical equivalences, quantifiers, proofs resolution, mathematical induction ,sets ,relations ,equivalence relations ,functions.

Module 2

Algorithms introduction, notations, recursive algorithms, complexity of algorithm, counting methods and pigeon hole principle, recurrence relations.

Module 3

Graph theory, paths and cycles, Hamiltonian cycles, representation of graphs, Eulerian paths, traveling sales man problem, trees, characterization, spanning trees, game trees.

Module 4

Algebraic systems semi groups, monoid, subgroups, homomorphism, isomorphism automorphism , rings, sub rings, posets, lattice, hasse diagrams

Text books:

1. Richard Johnsonbaugh - Discrete Mathematics Pearson Education fifth edition
2. Satinder Bal Gupta - Discrete mathematical structures Laxmi publications III edition

References:

1. Malik D. S., Sen S. K - Discrete Mathematical Structures , Thomson Learning
2. Garry Haggard, John Schlipf, Sue Whitesides, Discrete Mathematics for Computer Science, Thomson Learning
3. Bernard Kolman, Robert C Busby, Sharon Cutler Ross, Nadeem-ur-rehman Discrete mathematical structures, Pearson Education
4. J P Tremblay and Manohar Mc Graw Hill - Discrete mathematical structures with applications to computer science -
5. John Truss Addison Wesley- Discrete mathematical structures for Computer science

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 304 OBJECT ORIENTED PROGRAMING USING C++

Module 1
Object oriented technology, comparison with procedural programming (C and C++),key concepts of object programming, input and output in C++, declarations ,control structures, functions

Module 2
Classes and Objects, declaring objects, accessing member variables, defining member functions, inline functions, static member variables and functions, friend function, overloading, constructors and destructors, overloading constructors, copy constructors anonymous objects, dynamic initialization using constructors, dynamic operators and constructors, recursive constructors encapsulation

Module 3
Inheritance, types of inheritance, virtual base class, abstract class, advantages and disadvantages of inheritance, pointers and arrays, C++ and memory

Module 4
Binding, polymorphism and virtual functions, generic programming with templates, exception handling, string handling and file handling

Text Books:
1. Ashok N Kamthane , Pearson education - Object oriented programming with ANSI and TURBO C++ ,
2. Saurav Sahay - Object oriented programming with C++, Oxford

References:
1. Malik, Thomson Learning C++ Programming :From Problem Analysis To Program Design,
2. Forouzan, Thomson Learning - Computer Science :A Structured Approach Using C++,2nd Ed.,

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS305 PRINCIPLES OF PROGRAMING LANGUAGES

Module 1

Programming domains. Language Evaluation.Programming paradigms -Imperative programming,Functional programming,Object oriented programming,Logic programming. Formal methods of describing syntax and semantics - Backus Naur Form, Attribute grammars. Describing semantics - Denotational semantics.

Module 2

Data types, Names, Variables, Bindings, Scope and lifetime, Referencing Environments-Named Constants-Variable Initialization-Subprograms-Parameter Passing-Coroutines.

Module 3

Data abstraction and encapsulation. Polymorphism and inheritance. Features of object-oriented languages - Smalltalk,C++ and Java.Design and implementation issues. Exception handling.

Module 4

Functional programming languages - Lambda calculus - Introduction to pure LISP . Application of functional programming languages. Logic programming languages - a brief introduction to predicate calculus - Horn clauses - Logic programming. Introduction to Prolog. Applications of Logic programming.

Text Books:

1. Robert W.Sebesta, "Concepts of Programming Languages".
2. Ravi Sethi, "Programming Languages-concepts and constructs", Addison Wesley, Second Edition , 1996.

References:

1. Michael L. Scott, "Programming Language Pragmatics – Elsevier, New Delhi
2. Thomson Learning, Kenneth.C.Louden, "Programming Languages:Principles And Practices" ,2nd Ed.,.
3. Terence W. Pratt, "Programming Languages", Prentice Hall , Ninth edition1996.
4. Michael J Gordon, "Programming Language Theory and its implementation", Prentice Hall ,1991
5. Bjarn Stroustrup, "Design and Evolution of C++", Addison Wesley, 1991
6. "Symbolic Logic and Logic programming", Learning Material Series, Indian Society for Tech. Education, 1996
7. James Gosling "Java Programming Language", Addison Wesley,

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

EB/EE/CS 306 ELECTRONIC DEVICES & CIRCUITS

Module I

DC power supplies - power transformers - rectification - half wave , full wave, bridge - expression for ripple factor, efficiency, comparison, diode ratings. filters - capacitor - inductor LC filters- use of bleeder resistor - voltage multipliers - dual power supplies - zener and avalanche diodes - simple and series voltage regulator. *Special semiconductor devices:* Principles and operation of photodiodes, PIN diodes, phototransistors, LED, UJT. MOSFET- basic principles & characteristics.

Module II

Small Signal amplifiers: Bipolar junction transistor – configurations, characteristics - current amplification factors - relations between alpha & beta – comparison. *BJT amplifiers*: Biasing techniques of BJT- stabilization of operating point - h-parameters - CE RC coupled amplifier - concept of load lines- frequency response of RC coupled amplifier - frequency analysis of R C coupled amplifier - lower cut-off frequency - upper cut-off frequency - 3 db bandwidth.

FET Amplifiers: Principle of operation, characteristics, Common source amplifier- design, frequency response-applications

Module III

Power amplifier - classification - class A, B, AB and C power amplifiers-tuned amplifier- push-pull and complementary symmetry power amplifier –Harmonic distortion – Heat sinks.

Feed-back amplifiers: concept of Negative and positive feedback – Bark Hausen criteria -low frequency sinusoidal oscillators

High frequency oscillators – types- LC, Crystal oscillators –circuit diagram-description-applications

Module IV

Pulse Circuits:-Different types Pulse circuits - pulse characteristics - Pulse shaping using RC circuits - Differentiating and integrating circuits –applications. Clipping and clamping circuits using diodes - *Transistor as a switch*– simple sweep circuits-bootstrap sweep.

Multivibrators-astable, monostable and bistable ciruits using BJTs-applications

Text book:

1. Boylestead & Neshelsky, *Electronic Devices & Circuit Theory*, Prentice Hall of India.2003
2. Millman & Halkias, *Electronic Devices & Circuits*, Tata McGraw Hill, New Delhi.1996
3. Taub &Schilling, *Pulse,digital and Switching ciruits*,Tata Mc Graw Hill 2002

References:

1. Bapat Y N, *Electronic Devices & Circuits*, Tata McGraw Hill, New Delhi.1995
2. Allan Mottorshed, *Electronic Devices & Circuits*, Prentice Hall of India, New Delhi.2003
3. Schilling & Belove, *Electronic Circuits, Discrete & Integrated*, Tata McGraw Hill, New Delhi 1989
4. Theodore F.Bogart, *Electronic Devices & Circuits* Universal Book Stall, New Delhi 1992

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

EE/CS 307 ELECTRONICS CIRCUITS LABORATORY

1. Study of - Multimeter, Signal generators, CRO etc. and measurement of electrical quantities (Voltage, Current, FREQUENCY & PHASE)
   1.

2. **Characteristics of Active devices**

- Forward and reverse characteristics of a diode - measurement of forward resistance

- Common base characteristics of a transistor - measurement of current gain, input resistance and output resistance, maximum ratings of the transistor.
- Common emitter characteristics of a transistor - measurement of current gain, input resistance and output resistance, relation between and study of the effect of leakag current, maximum ratings of the transistor.
- Common source characteristics of a JFET - measurement of transconductance g_m and
  - drain to source resistance r_{ds} , use of FET as VVR.

3.**Rectifying circuits**

- HW rectifier
- FW rectifier
- FW Bridge rectifier
- Filter circuits - Capacitor filter, inductor filter and Pi section filter

(Measurement of ripple factor, maximum ratings of the devices)

4.Regulators –Simple zener voltage regulator,study of transistor series voltage regulator
5.RC coupled amplifier-Frequency response characteristics

6.Low frequency oscillators-RC phase shift or Wien Bridge oscillator

7.Differentiating and Integrating circuits

1. Clipping and clamping circuits
2. Astable multivibrator

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS/IT 308 OBJECT ORIENTED PROGRAMMING LABORATORY

Exercises to make the students understand the following concepts

- Difference between struct and class
- Data abstraction
- Data encapsulation and information hiding
- Inheritance
  - Single inheritance
  - Multiple inheritance
  - Multilevel inheritance
  - Hierarchical inheritance
- Abstract class
- Operator overloading
- Function overloading
- Over-riding
- Pointers and arrays
- Files

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

EB/EC/EE/EI/CE/CS/IT/ME/SE 401 ENGINEERING MATHEMATICS III

Module 1

Complex Analytic functions and conformal mapping: curves and regions in the complex plane, complex functions, limit, derivative, analytic function, Cauchy - Riemann equations, Elementary complex functions such as powers, exponential function, logarithmic, trigonometric and hyperbolic functions. *Conformal mapping*: Linear fractional transformations, mapping by elementary functions like Z^2, e^z, sin z, cos z, sin hz, and Cos hz, Z+1/Z.

Module 2

Complex integration: Line integral, Cauchy's integral theorem, Cauchy's integral formula, Taylor's series, Laurent's series, residue theorem, evaluation of real integrals using integration around unit circle, around the semi circle, integrating contours having poles, on the real axis.

Module 3

*Partial differential equations:*Formation of partial differential equations. Solutions of equations of the form F(p, q) = 0, F(x,p,q)=0, F(y,p,q)=0, F(z,p,q)=0, F1(x,p) = F2 (y,q), Lagrange's form Pp+Qq = R. Linear homogeneous partial differential equations with constant co-effients.

Module 4

Vibrating string : one dimensional wave equation, D'Alembert's solution, solution by the method of separation of variables. *One dimensional heat equation,* solution of the equation by the method of separation of variables, *Solutions of Laplace's equation* over a rectangular region and a circular region by the method of separation of variables.

Text Books:

1. R.K.Jain, S.R.K.Iyengar: Advanced Engineering Mathematics, Narosa Publishers.1991
2. C.R.Wilie & L.C.Barrett: Advanced Engineering Mathematics, MGH Co.

References:

1. Ervin Kreyszig, Wiley Eastern - Advanced Engineering Mathematics
2. Churchill R.V- Complex Variables & Applications: MGH Publishers.
3. M.C.Potter - Advanced Engineering Mathematics, , J.L.Goldberg Oxford University Press

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/EC/EI 402 MICROPROCESSORS

Module 1

Introduction to 8 bit microprocessor: Microcomputers and microprocessors, 8/ 16/ 32/ 64-bit microprocessor families; Internal architecture of Intel 8085 microprocessor: Block diagram, Registers, Internal Bus Organization, Functional details of pins, Control signals, External Address / Data bus multiplexing, Demultiplexing, I/ O mapped I/ O, and memory mapped I/ O techniques.Interrupts, Serial communication and DMA features

Module 2

Assembly Language Programming: 8085 instruction set: Instructions, Classifications, Addressing modes, Stack and Subroutines, Delay routines, Counters etc. Programming examples.

Module 3

Instruction Timing and Interrupts: Timing Diagrams (of various instructions): T- state, Machine cycle (Opcode fetch, Read / Write, Interrupt Acknowledge, Bus Idle, etc), Interrupts: -types (h/ w and s/ w), Maskable / Non maskable, their organization.

Module 4

Interfacing concepts and devices:

Memory interface: Concept of memory chip/ chips interface to 8085 with appropriate examples

Programmable interfacing devices: - Programmable peripheral interface (Intel 8255), Programmable timer interface (Intel 8253/ 54), Programmable display / Keyboard interface (Intel 8279), Programmable serial communication interface (Intel 8251)-(their architecture, register orga nization, initialization, hard ware and software inter face to 8085.

Text Books:

1. Ghosh and Sridhar: 0000 to 8085 Microprocessors for Engineers and Scientists
2. Gaonkar: Microprocesors, Architecture, Programming and Applications.

References:

1. Nagoor Kani, Microprocessors, architecture and programming, RBA Publications, 2004
2. Douglas V. Hall , Microprocessors, Interfacing and Peripherals, Tata McGraw Hill,2nd ed.
3. S. P. Chowdhuray, Sunetra Chowdhuray, Microprocessors and Peripherals, SCITECH, 2004

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 403 COMPUTER ARCHITECTURE & ORGANISATION

Module 1

Basic structure of computers – Functional units – Basic operational concepts – Bus structures – Instructions & instruction sequencing. Hardware and software - Addressing modes – Assembly language – Stacks &Subroutines

Module 2

Processing Unit – Fundamental concepts – Execution of a complete instruction - Hardwired control unit- micro programmed control - control signals - microinstructions- micro program sequencing- Branch address modification- Pre-fetching of micro instructions- Emulation.

Computer arithmetic - logic design for fast adders - multiplication - Booth's algorithm - Fast multiplication - integer division - floating point numbers and operations.

Module 3

Memory organization-Semiconductor RAM memories- internal organization of memory chips- Static and Dynamic memories - cache memories - mapping functions- replacement algorithms - virtual memory - address translations – performance considerations – interleaving - Secondary storage.

Module 4

Input-output organizations - interrupts – Enabling & Disabling interrupts - handling multiple devices - device identification - vectored interrupts - interrupt nesting – Simultaneous requests – DMA - Buses - I/O interface circuits –Standard I/O interfaces.

Text Books:

1. Hamacher C. V., "Computer Organisation – International Edition -5th Edition", Mc.Graw Hill, NewYork
2. Stallings William, "Computer Organization and Architecture",6th Edition, Pearson Education ,2003

References:

1. Pal Chaudhary P, "Computer Organisation and Design " , Prentice Hall, New Delhi,
2. Hayes J P , "Computer Organisation and Architecture - 2nd Edition ", Mc Graw Hill,
3. Tanenbaum A S , "Structured Computer Organisation - 3rd Edition", Prentice Hall,
4. Behrooz Parhami, Computer Architecture from Microprocessors to Supercomputers Oxford Indian Edition
5. Kai Hwang & Faye A Briggs "Computer Archtecture and Parallel Processing "Mc.Graw Hill.,NewYork –1985
6. D.A Pattersen and J.L Hennesy ,"Computer Organization and Design: The hardware/software Interface 2nd Edition", Harcourt Asia private Ltd. (Morgan Kaufman),Singapore 1998

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 404 AUTOMATA LANGUAGES AND COMPUTATION

Module 1

Finite state systems NFA DFA, Equivalence of NFA and DFA, Equivalence of NFA and NFA with epsilon moves, regular expression, Equivalence of regular expression and finite automata, Finite automata with output associated with state, Finite automata with output associated with transition, Equivalence of finite automata with output, applications of Finite automata, Pumping Lemma , closure properties of Regular sets, Decision algorithms , My Hill Nerode theorem ,minimization of DFA

Module 2

Context Free grammars derivations parse Trees, ambiguity Simplification CNF,GNF,PDA DPDA, equivalence of PDA and CFL, pumping lemma for CFL, Closure Properties, decision algorithms, CYK algorithm

Module 3

Turing machine, Techniques for construction of TM , storage in finite control, multiple tracks ,shifting over ,checking of symbols ,subroutines, NDTM , undecidability, universal TM

Module 4

Recursive and recursively enumerable languages, Properties, halting problem of TM Chomsky Hierarchy ,equivalence of regular grammar and FA , equivalence of unrestricted grammar and TM , equivalence of LBA and CSL relation between languages

Text Books:

1. J E Hopcroft and J D Ullman Introduction to Automata Theory and Languages and Computation, Addison Wesley
2. Michael Sipser, Introduction to the Theory of Computation, Thomson Learning

References:

1. Misra and Chandrasekharan, Theory of Computation, Prentice Hall
2. H R Lewis Papadimitrou, Elements of Theory of Computation PHI
3. John Martin, Introduction to Language and Theory of Computation, TMH
4. Peter Linz, An Introduction to Formal Languages and Automata Narosa Publucation

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 405 DATA STRUCTURES & ALGORITHMS

Module 1

Introduction to Data structures - Arrays & sparse matrices – representation, Searching - linear, binary, Fibonacci – Sorting – selection, bubble, insertion, quick, merge, heap, Introduction to external sorting, Hash tables – Hashing functions

Module 2

Linked lists – singly, doubly and circular lists, Application of linked lists – Polynomial manipulation, Stacks – Implementation of stacks using arrays and lists – Typical problems – Conversion of infix to postfix – Evaluation of postfix expression . Queues & Deques – implementation., priority queues

Module 3

Trees, Definition and mathematical properties. Representation – sequential, lists - Binary trees – Binary tree traversals – pre-order, in-order & post-order, Expression trees . Threaded binary trees . Binary Search trees . AVL trees

Module 4

Graphs – Graph representation using adjacency matrices and lists – Graph traversals – DFS, BFS - shortest path – Dijkstra's algorithm, Minimum spanning tree – Kruskal Algorithm, prims algorithm – Binary search, B trees and B+ trees.

Text Book:

1. Michael Waite and Robert Lafore, "Data Structures and Algorithms in Java" , Techmedia, NewDelhi, 1998.
2. Adam drozdek," Data Structures and Algorithms in Java" ,Thomson Publications, 2nd Edition.
3. Sartaj Sahni, 'Data Structures, Algorithms, and Applications in Java", McGraw-Hill

References:

1. Aaron M.Tanenbaum, Moshe J.Augenstein, "Data Structures using C", Prentice Hall InternationalInc., Englewood Cliffs, NJ, 1986
2. Ellis Horowitz and Sartaj Sahni, " An introduction to Data Structures", Computer Science Press,Rockville, MA, 1984
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Benjamin/CummingsPublishing Company Inc., Redwood City, CA, 1991
4. Jean Paul Tremblay and Paul G Sorenson, "An introduction to Data Structures with Applications",McGraw-Hill, Singapore, 1984

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 406 DATA COMMUNICATION

Module 1

Data transmission: Communication model-Data Transmission: Concepts and Terminology- Analog and Digital Data Transmission- Transmission Impairments- Guided transmission media- Wireless Transmission- Line-of-sight Transmission. Channel Capacity-Band width and Shannon's capacity equation

Module 2

Signal Encoding Techniques: *Digital Data,Digital Signals*:-Unipolar. Polar: NRZ-RZ-Biphase-Manchester-Differential Manchester. Bipolar: AMI-B8ZS-HDB3.

Digital Data, Analog Signals:-Aspects of Digital to Analog Conversion: Bit rate and Baud rate-Constellation pattern. ASK-FSK-PSK-QPSK-QAM-Bandwidth of ASK,FSK,PSK and QAM.

Modems-Types of modem-Modem standards

Analog Data, Digital Signals:- Sampling principles-Quantization-Nyquist Theorem. PAM-PCM-Delta Modulation

Analog Data, Analog Signals:-AM-FM-PM-Bandwidth of AM,FM and PM.

Data Compression:- Frequency dependent coding-Huffman coding-LZW Coding

Module 3

Digital Data Communication Techniques: Asynchronous and Synchronous Transmission-Types of Errors-single bit and burst errors-Error Detection: Redundancy- LRC-VRC-CRC-Capabilities and performance of CRC-Error Correction: single bit error correction – Hamming code- Burst error correction-convolution code.

Data Link Control: Line discipline-Flow control-Error control: ARQ-stop and wait ARQ-Continuous ARQ-Line utilization of different ARQs-Link management-HDLC

Module 4

Multiplexing: Frequency-Division Multiplexing-Synchronous Time-Division Multiplexing-Statistical Time-Division Multiplexing-Asymmetric Digital Subscriber Line-xDSL

Spread Spectrum: The Concept of Spread Spectrum-Frequency Hopping Spread Spectrum-Direct Sequence Spread Spectrum-Code-Division Multiple Access

Text Books:

William Stallings, *Data and Computer Communication*, 8/e ,Pearson education,2006.

References:

1. Behrouz A. Forouzan, *Data Communication and Networking* 4/e, TMH,2006.
2. Fred Halsal, *Data Communication Computer Network and Open Systems, 4/e*, Person education ,2005.
3. William A. Shay, *Understanding Data Communication & Networks*, 2/e, Thomson Learning,2003
4. James Irvin & David Harle, *Data communication and Networks: an Engineering approach*, Wiley,2006.

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/EC/EE/EI 407 DIGITAL ELECTRONICS LABORATORY

1. Half adder and full adder using NAND gates.
2. Code converters - Binary to Gray and gray to Binary using mode control
3. Binary addition and subtraction (a) 1's complement (b) 2's complement(using 7483)
4. BCD adder using 7483.
5. Study of MUX, DeMUX &Decoder Circuits and ICs
6. Set up R-S & JK flip flops using NAND Gates
7. Asynchronous UP / DOWN counter using JK Flip flops
8. Design and realization of sequence generators.
9. Study of shift registers and Implementation of Johnson and Ring counter using it.
10. Study of IC counters 7490, 7492, 7493 and 74192 or the CMOS equivalent.
11. Astable and monostable multi- vibrators using TTL gates.
12. Transfer characteristics and specifications of TTL gates

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS/IT 408 DATA STRUCTURES LABORATORY

1. Simple programming exercises in Java
2 Study of algorithms and implementation in Java programming language for the following:
    - Searching and Sorting
    - Linked Lists- Singly and doubly
    - Stacks – various applications
    - Queues
    - Trees
    - Graphs

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

EB/EC/EE/EI/CE/CS/IT/ME/SE 501 ENGINEERING MATHEMATICS IV

Module 1

Probability distributions: random variables (discrete & continuous), probability density, mathematical expectation, mean and variance of a probability distribution, binomial distribution, Poisson approximation to the binomial distribution, uniform distribution , normal distribution. *Curve fitting*: method of least squares, correlation and regression, lines of regression.

Module 2

Sampling distributions: population and samples, the sampling distribution of the mean unknown),σ known), the sampling distribution of the mean (σ(the sampling distribution of the variance, point estimation, interval estimation, tests of hypotheses, null hypotheses and significance tests, hypothesis concerning one mean, type I and type II errors, hypotheses concerning two means. The estimation of variances : Hypotheses concerning one variance - Hypotheses concerning two variances.

Module 3

Finite difference Operators: ∇, Δ, E, δ, μ , $x^{(n)}$ .Newton's Forward and Backward differences interpolation polynomials, central differences, Stirlings central differences interpolation polynomial. Lagrange interpolation polynomial, divided differences, Newton's divided differences interpolation polynomial. *Numerical differentiation:* Formulae for derivatives in the case of equally spaced points. *Numerical integration:* Trapezoidal and Simpson's rules, compounded rules, errors of interpolation and integration formulae. Gauss quadrature formulae (No derivation for 2 point and 3 point formulae)

Module 4

Numerical solution of ordinary differential equations: Taylor series method, Euler's method, modified Euler's method, Runge-Kutta formulae 4th order formula. *Numerical solution of boundary value problems:* Methods of finite differences, finite differences methods for solving Laplace's equation in a rectangular region, finite differences methods for solving the wave equation and heat equation.

Text Books:

1. Irvrin Miller & Freind : Probability And Statistics For Engineers, Prentice Hall Of India
2. S.S.Sastry: Numerical Methods, PHI Publishers.

References:

1. P.Kandaswamy K.Thilagavathy, K.Gunavathy: Numerical Mehtods, S.Chand & Co.
2. A.Papoulis: Probability,Random Variables And Stochastic Processes,MGH Publishers

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 502 SYSTEM PROGRAMMING

Module 1

Assemblers: Overview of the assembly process - Machine dependent assembler features-Machine independent assembler features-Design of two pass assembler-single pass assembler.

Module 2

Loaders and linkers -Loader functions-program relocatability- absolute and bootstrap loader-Overview of linkage editing-linking loader-Dynamic linking-Design of the linkage editor.

Module 3

Macroprocessors - macro definition and usage-Schematics for Macro expansion-Generation of unique labels- Conditional macro expansion- Recursive macro expansion-Design of a Macro pre-processor-Design of a Macro assembler.

Module 4

Operating Systems – Basic Operating Systems functions – Types of Operating Systems – User Interface – Run-time Environment. Operating Systems Design Options – Hierarchical Structures – Virtual Machines – Multiprocessor Operating Systems – Distributed Operating Systems – Object Oriented Operating Systems.

Text Books:

1. Leland L.Beck, "System Software - An Introduction to System Programming", Addison Wesely

References:

1. D.M.Dhamdhere, "System Programming and Operating Systems", 2nd Ed., Tata Mcgrawhill
2. John J. Donovan, "Systems Programming", McGraw Hill.

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 503 SOFTWARE ENGINEERING

Module 1

Software Life Cycle - Water fall model – Prototyping – Spiral model – pros and cons of each model .

Requirements Analysis - SRS – DFD – ER Diagrams – Decision tables – Decision Trees – Formal specification techniques: Axiomatic and Algebraic specifications - Petrinets

Module 2

Software Design: Design Heuristics – Cohesion and Coupling

Design Methodologies - Structured analysis and design, Architectural Design, Interface design, Component Level design.

Software Reuse and Software Maintenance issues.

Module 3

Introduction to Software Quality Management - Software Testing - Objectives of testing – Functional and Structural testing –Generation of test data - Test Plan - Unit testing – Integration testing – System testing – Test reporting.

Overview of SQA Planning – Reviews and Audits – Software configuration management - Quality Standards - Study of ISO9000 & CMM

Module 4

Software Project Management - Brief study of various phases of Project Management – Planning – Organizing – Staffing – Directing and Controlling

Software Project Cost Estimation – COCOMO model – Software Project Scheduling

CASE tools: CASE definitions – CASE Classifications – Analysis and Design Workbenches, Testing Workbenches

Text Book:

1. Rajib Mall - Fundamentals of Software Engineering –, PHI.
2. Pankaj Jalote - Software Engineering –Narosa Publications

References:

1. Ali Behferooz and Frederick J. Hudson - Software Engineering Fundamentals -, Oxford University Press India.
2. Roger S. Pressman - Software Engineering – Mc GrawHill International Edition
3. Ian Somerville - Software Engineering – Pearson Education
4. Alka Jarvis & V. Crandall - In roads to Software quality –
5. Richard Thayer - Software Project Management –
6. Bass, Software Architecture Interactives - Pearson Education ,2003

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 504 COMPUTER GRAPHICS

Module 1

Graphic hardware. Graphic software Output primitives –points and lines. Line drawing algorithms - circle generating algorithms - polygon filling algorithms – Filling arcs – pattern filling Output attributes - Bundled attributes. Antialiasing. Graphical user interface - Logical classification of input devices.

Module 2

Two dimensional transformations. basic transformations - translation - rotation - scaling. Matrix representation and homogeneous coordinates - composite transformations. Transformation between coordinate systems - Affine transformations. Two dimensional viewing - viewing pipeline - Windows to viewport transformations - clipping operations - point clipping - line clipping - polygon clipping.

Module 3

Three dimensional object representations. polygon surfaces - curved surfaces. Spline representations - Hermite polynomials - Cubic splines - Bezier curves - B-splines. Octrees and BSP trees. Fractal geometry methods. Three dimensional transformations.. Three dimensional viewing. Projections.

Modula 4

Visible surface detection. Classification of visible surface detection algorithms. Back face detection - Depth buffer - A-buffer. Scan line algorithms- Depth sorting - Area subdivision methods octrees - BSP trees - octrees - Shading . Illumination models - light sources. Basic Illumination models. Polygon rendering - constant intensity - Goraud shading - Phong shading - Animation techniques.

Text Book:

1. Donald Hearn ,M Pauline Baker, *Computer Graphics C version,* 2/E Pearson Education ,2003 .

References:

1. James D.Foley et.al., Introduction to Computer Graphics, Addison Wesley Publishing Company, 1994
2. Alan Watt, Mark Watt, Introduction to Animation and Rendering,, Addison Wesley Publishing Company, 1994
3. Newmann W and Sproull R.F., Principles of Interactive Computer Graphics, McGraw-Hill,1980
4. Rogers D.F., Procedural Elements for Computer Graphics, McGraw-Hill, 1985

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 505 DATABASE MANAGEMENT SYSTEMS

Module 1

Introduction: Characteristics of the Database approach – Data models, schemas and instances – DBMS architecture – Data independence – Database languages and interfaces – Database administrator – Data modeling using Entity - Relationship (ER), Entity sets, attributes and keys - Relationships, Relationship types, roles and structural constraints - Weak Entity types - Enhanced Entity-Relationship (EER) and object modeling. Sub classes, super classes and inheritance - Specialization and generalization.

Module 2

Record storage and file organizations: Placing file records on disks – Fixed length and variable length records - Spanned Vs Unspanned records – Allocating file records on disk– Files of unordered records(Heap files), Files of ordered records(Sorted files).- Hashing Techniques. Indexed structures for files – Types of single level ordered index, multi- level indexes.

Module 3

The Relational model: Relational model concepts – Relational model constraints - The Relational Algebra – Relational calculus – Tuple Relational calculus, Domain Relational calculus. - SQL. Database Design: Functional dependencies – Basic definitions – Trivial and non trivial dependencies –Closure of a set of dependencies – Closure of a set of attributes – Irreducible sets of dependencies – Nonloss decomposition and Functional dependencies. First, Second and Third normal forms – Boyce-codd normal form.

Module 4

Transaction Management- Concurrency Control-Lost Updates- Uncommited Data-Inconsistent Retrievals-The Scheduler-Concurrency Control with Locking Methods – Concurrency Control with Time Stamping- Concurrency Control with Optimistic Methods- Database Recovery Management.

Introduction to object oriented databases, Active databases. Data warehouses – Data mining

Text Books:

1. Elmasri and Navathe, *"Fundamentals of Database Systems*" , 3/e, Addison - Wesley, 2001.
2. Peter Rob Carlos Coronel, Database Systems , Design, Implementation &Management , 5/e,Thomson Course Technology
3. A Silberschatz, H. F. Korth, and S Sudarshan, *"Database System Concepts*", 3/e,Tata McGraw Hill,1997

References:

1. Thomas Connoly ,Carolyn Begg " Database Systems",3/e,Pearson Education.
2. C.J Date, " *An Introduction to Database Systems* ", Addison-Wesley
3. Margaret.H.Dunham *,"Data Mining. Introductory and advanced topics*", Pearson Education,2003.
4. Hector Garcia-Molina,Jeffret D. Ullman, Jenniffer Widom ,"*Database System implementation*", Prentice Hall International, Inc, 2000.

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB 506 MICROPROCESSOR BASED SYSTEM DESIGN

Module 1

Architecture of 16 bit microprocessors: Intel 8086 Architecture — Segment registers and memory segmentation – memory address space and data organization, addressing modes, instruction set, instruction template examples, instruction execution timing. Assembly Language programming, programming examples;

Modular programming-Assembler instruction format, assembler directives and operators, assembly process, linking and relocation, debugging, stacks, procedures, interrupt routines, macros

Module 2

8086 hardware design:minimum mode and maximum mode configurations, pin configuration of 8086, comparison with 8088; Bus structure, bus buffering, latching, system bus timing with diagram,

Peripherals and their interfacing:Dynamic RAM interfacing, interfacing I/O ports,, interfacing with programmable interrupt controller 8259,programmable DMA interface 8237, DMA transfer and operations

Multiprocessor Systems:Interconnection topologies-interfacing with 8087- architecture of 8087 and configuration- Design of a PC based multimicroprocessor system

Module 3

Architecture of 32 bit Microprocessors: Intel 80386 Architecture, Block Diagram, Addressing modes,Data Types 80386,Real address mode of 80386 protected mode of 80386, segmentation,paging and Virtual modes

Recent advances in microprocessor architectures-Pentium families-salient features of Pentium II Pentium III and Pentium IV- a few relevant concepts of computer architecure-pipelining,CISC and RISC Architecture-Introduction to dual-Core Architecture.

Module 4

Introduction to micro controllers - comparison with microprocessors Study of micro controller (MCS 51 family- 8051) - Architecture, instruction set, addressing modes and programming - Comparison of various families of 8bit micro controllers. Interfacing with sensors and actuators

Text books:

1. Ajoy Kumar Ray, Kishor M.Bhurchandi, Advanced Microprocessors and Peripherals,TMH, New Delhi,2000
2. Kenneth Ayala The 8086 Microprocessor :programming and interfacing the PC Thomson Learning
3. Mazidi, “The 8051 Microcontrollers & Embedded Systems”, Pearson Education.

References:

1. Kenneth Ayala“, The 8051 Microcontroller”, West Publishing Company.
2. Douglas V Hall,” Microprocessors & Interfacing-Programming and Hardware” TMH
3. Avtar Singh , “ The 8088 and 8086 Microprocessors_programming, Interfacing, Software, Hardware and Applications” PHI

4. Barry B. Brey, "The INTEL Microprocessors - 8086/8088, 80186/80188, 80286, 80386, 80486 Pentium and Pentium pro processor, Pentium II, Pentium III and Pentium IV - Architecture, Programming and interfacing", PHI , 6 Ed, 2003.
5. YU-Cheng Liu & Glenn A Gibson," Microprocessor System , Architecture Programming & Design"
6. Kenneth Hintz & Daniel Tabak "Microcontroller architecture implementation and programming" , Mc Graw Hill.
7. Intel Users manual for 8086, 80386 & 80486, Pentium & Pentium pro
8. "Microprocessor Systems", Learning Material Series, ISTE, NewDelhi,1997
9. John B. Peatman, "Design with microcontrollers" McGraw Hill, Singapore.

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/EC/EI 507 MICROPROCESSOR LABORATORY

PART I – 3 Lab sessions

Part I A (Compulsory)
1. Study of a typical microprocessor trainer kit and its operation
2. Interfacing and programming of 8255.(eg: traffic light control, burglar alarm, stop watch)
3. Interfacing and programming of 8253/ 8254.
4. Interfacing and programming of 8279.

Part I B*
1. A/D and D/A converter interface
2. Stepper motor interface
3. Display interface
4. Programming of different types of EPROM 2716, 2732 etc

(* At least two topics from part B has to be covered.)

PART II – 7 Lab sessions

(Compulsory)

1. Introduction to IBM/PC and its DEBUG program commands
   - Examining and modifying the contents of the memory
   - Assembling 8086 instructions with the ASSEMBLER commands
   - Executing 8086 instructions and programmes with the Trace and GO Command.
   - Debugging a program
2. Assembly language program development using IBM/PC Macro assembler
   - Creating an Assembler source file
   - Assembling source program with MASM
   - The link program - creating a RUN module
   - Typical programming examples.
3. Interfacing Experiments with micro controllers

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS 508 COMPUTER GRAPHICS LAB

1. Implementing Line ,Circle and Ellipse drawing algorithms
2. Implementing scan line polygon filling algorithm
3. Implementing seed filling algorithms –flood fill, Boundary fill (recursive and non recursive)
4. Implementing line clipping methods
5. Implementing polygon clipping methods
6. Generation of different 2D patterns and images.
7. 2D transformations using homogeneous coordinates
8. Generating Beizier and B-spline curves
9. Implementation of Hidden surface elimination techniques of 3D objects
10. Implementation of Shading methods for 3D objects
11. Implementation of animation methods.
12. Programming using Open GL
    (Can be done as a development of a small 2D/3D graphics package or Game using OpenGL)

References:

1. Donald Hearn ,M Pauline Baker, *Computer Graphics C version,* 2/E
2. Pearson Education ,2003
3. James D.Foley ct.al., *Introduction to Computer Graphics*, Addison Wesley Publishing
4. Company, 1994.
5. Mason Woo et.al, *OpenGL Programming Guide – The official guide to OpenGL*, 3rd
6. Edition, OpenGL Architecture Review board
7. Noman Lin, *Linux 3D Graphics Programming*, Worldwide Game Development
8. Library.
9. Ron Fosner, *OpenGL programming for Windows 95 and Windows NT*

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS 601 COMPILER CONSTRUCTION

Module 1

Compiler: Introduction – Analysis of the source program – phases of a compiler – Compiler construction tools – Lexical analysis – Role of the lexical analyser – Specification of tokens – Recognition of tokens – Lexical analyser generators.

Module 2

Syntax Analysis – Role of the parser – Context free grammars – Top-down parsing – Bottom-up parsing – Operator precedence parsing – LR parsers (SLR, Canonical LR, LALR) – Parser generators.

Module 3

Syntax-directed translation – Syntax-directed definitions – S-attributed definition – L-attributed definition – Top-down and bottom-up translation – Type checking – Type systems – Specification of a type checker. Run time environment – Source language issues – Storage organization – Storage allocation strategies – Access to nonlocal names – Parameter passing – Symbol tables.

Module 4

Intermediate code generation – Intermediate languages – Declaration – Assignment Statement – Boolean expression – Procedure calls - Code optimisation – Introduction – Sources of optimisation – Introduction to data flow analysis. Code generator – Issues in the design of a code generator, the target machine, A simple code generator.

Text Books:

1. Alfred V. Aho, Ravi Sethi & Jeffrey. D. Ullman, “Compilers Principles, Techniques & Tools”.

References :

1. Kenneth.C.Louden, Compiler Construction:Principles And Practice, Thomson Learning, India
2. Keith D. Cooper & Linda Torczon, Engineering a Compiler, Elsevier, New Delhi.
3. S.S. Muchnick, Harcourt Asra, Advanced Compiler Design implementation, Morgan Kaufman, 1997
4. Modern Compiler Implementation in C , Cambridge Uty. Press 1997.
5. Alan Holub, Compiler Design in C, PHI
6. Kenneth C. Louden, Compiler Construction, Principle and Practice, Thomson Books

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EE 602 DIGITAL SIGNAL PROCESSING

Module 1

Introduction to signals & systems- Discrete time signals and systems- Properties of discrete systems-linearity, time invariance-causality-stability-convolution-difference equation representation of discrete systems -The Z transform-properties of Z transform-the inverse z transform-System Transfer function.

Module 2

Frequency domain representation of discrete time signals. Discrete Fourier series(DFS)-properties Discrete Time Fourier Transform (DTFT) properties, Discrete Fourier Transform(DFT) properties& Fast Fourier Transform(FFT) Decimation in Time & Decimation in Frequency algorithms.

Module 3

FIR digital Filters: Transfer function. Generalized Difference equation representation. Concept of windowing. Non Recursive realization structures-direct (Tapped delay line structure) –cascade realization- Liner phase realization.

IIR Digital Filters : - Transfer function. Difference equation representation. Recursive Realizations Direct form I , Direct form II –Cascade Realization-Parallel realization – Comparison of IIR & FIR filters in terms of computational complexity, memory requirement, hardware complexity, stability .

Module 4

Finite word length effects in digital filters- fixed point arithmetic -Floating point arithmetic- Block floating point arithmetic - Truncation-Rounding - Quantization error in analog to digital conversion-Limit cycles. General DSP architecture- features _ On chip subsystems- memory organization-Addressing modes- Instruction types - TMS320C54X fixed point processor- TMS320C4X floating point processor

Applications of DSP

Text:

1. P.Ramesh Babu: Digital signal Processing,SCITEC Pub., 3rd ed
2. Sanjit K. Mithra, : " Digital Signal Processing", Tata Mc- Graw Hill

References:

1. John G Proakis & Dimitris G Manolakis : "Digital Signal Processing", PHI, New Delhi
2. Oppenheim & Ronald W Schafer : "Digital Signal Processing", Prentice Hall India
3. Steven W. Smith, Digital Signal Processing-A practical guide for Engineers and Scientists , Elsivier India Pvt.Ltd, 2006
4. Avatar Singh, Digital Signal Processing Implementations, Edition 1

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 603 OPERATING SYSTEMS

Module I

Introduction to Operating Systems. Processes - Interprocess Communication - Race Conditions - Critical Sections – Mutual Exclusion - Busy Waiting - Sleep And Wakeup - Semaphores - Event Counters - Monitors - Message Passing. Process Scheduling - Round Robin Scheduling - Priority scheduling -multiple queues - Shortest Job First - Guaranteed scheduling - Two- level scheduling.

Module II

Memory management. Multiprogramming. Multiprogramming and memory usage - Swapping - multiprogramming with fixed and variable partitions - Memory management with bit maps, linked lists, Buddy system - allocation of swap space. Virtual memory - paging and page tables, associative memory - inverted page tables. Page replacement algorithms.

Module III

File systems and I/O files. Directories - File system implementation - security and protection mechanisms.

Principles of I/O hardware - I/O devices - device controllers - DMA. Principles of I/O software - interrupt handlers - device drivers - Disk scheduling - clocks and terminals.

I/O Buffering - RAID- Disk Cache.

Module IV

Deadlock - conditions for deadlock. Deadlock detection and recovery. Deadlock avoidance - resource trajectories - safe and unsafe states - bankers algorithm. Deadlock prevention. Two phase locking – non-resource deadlocks - starvation.

Case Study: UNIX / LINUX operating system

Text Book

1. William Stallings, "Operating systems", Pearson Education, Fifth edition
2. D.M.Dhamdhere, "Operating Systems", 2nd Edition, Tata McGraw-Hill

Reference

1. Garry Nutt, "Operating Systems – A Modern perspective ", Third Edition, Pearson Education
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall
3. Bach, M.J., "Design of UNIX Operating System", Prentice Hall
4. Charles Crowley, "Operating systems – A Design Oriented Approach", Tata McGrawhill, 1997
5. Michel Palmer "Guide o Operating Systems", Vikas Thomson Learning Publishing, NewDelhi

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS /IT 604 ANALYSIS AND DESIGN OF ALGORITHMS

Module 1

Analyzing Algorithms and problems. Classifying functions by their asymptotic growth rate. Recursive procedures. Recurrence equations - Substitution Method, Changing variables, Recursion Tree, Master Theorem. Design Techniques- Divide and Conquer, Dynamic Programming, Greedy, Backtracking

Module 2

Analysis of searching and sorting. Insertion sort, Quick sort, Merge sort and Heap sort. Binomial Heaps and Fibonacci Heaps, Lower bounds for sorting by comparison of keys. Comparison of sorting algorithms. Amortized Time Analysis. Red-Black Trees – Insertion & Deletion.

Module 3

Graphs and graph traversals. Strongly connected components of a Directed graph. Biconnected components of an undirected graph.
Transitive closure of a Binary relation. Warshalls algorithm for Transitive closure. All pair shortest path in graphs. Dynamic programming. Constructing optimal binary search trees.

Module 4

Complexity Theory - Introduction. P and NP. NP-Complete problems. Approximation algorithms. Bin packing, Graph coloring. Traveling salesperson Problem.

Text Books:

1. T. H. Cormen, C. E. Lieserson, R. L. Rivest, Introduction to Algorithms, Prentice Hall India,2004
2. Allen Van Gelder, Sara Baase, "Computer Algorithms - Introduction to Design and Analysis", 3rd Edition,2004

References:

1. Anany Levitin, "Introduction to the design and analysis of algorithms", Pearson Education
2. A.V.Aho, J.E.Hopcroft and J.D. Ullman, "The Design and Analysis of Computer Algorithms", Addison Wesley Publishing House, Reading, MA
3. E Horowitz and S Sahni, "Fundamentals of Computer Algorithms", Computer Science Press, Rockville
4. Jeffrey H.Kingston, "Algorithms and Data Structures - Design, Correctness and Analysis ", Addison Wesley, Singapore, 1990
5. Knuth, "Art of Computer Programming Vol II, Sorting and Searching,", Prentice Hall

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/EC/EI 605 CONTROL SYSTEMS ENGINEERING

Module 1

Basic idea of control systems and their classification - differential equations of systems - linear approximation - Laplace transform and transfer function of linear system - Model of physical system (Electrical, mechanical and electromechanical)- block diagram - signal flow graph - Mason's gain formula.

Module 2

Time domain analysis - Representation of deterministic signals - First order system response - S-plane root location and transient response - impulse and step response of second order systems - performance - characteristics in the time domain - effects of derivative and integral control - steady state response - error constant - generalised definition of error coefficients - concepts of stability - Routh - Hurwitz criterion.

Module 3

Frequency domain analysis - frequency response - Bode plot, Polar plot, Nicol's chart - closed loop frequency response and frequency domain performance characteristics. Stability in frequency domain. Nyquist criterion.

Module 4

Root locus method - basic theory and properties of root loci - procedure for the construction of root loci - complete root locus diagram. Design and compensation of feed back control system: approaches to compensation - cascade compensation networks and their design in the frequency domain - simple design in S-plane.

Text Book:

1. Ogata K: " Modern Control Engineering", Prentice Hall/Pearson,2002

References:

1. Dorf: Morden Communication Systems ,Pearson Education
2. Franklin: Feed back Control Systems, Pearson Education,1994
3. Kuo B. C: "Automatic Control System", Prentice Hall, 1991
4. Nagoor Kani: Control Systems, R B P,2002
5. Ogata: Discrete Time Control Systems ,Pearson Education,1987
6. Nagarath & Gopal: " Control System Engineering", Wiley Eastern,1991
7. Ramkayan: Control Engineerng, Vikas Publications
8. M N Bandyopadhyaya: Control Theory ,PHI
9. Glad: Control Theory, Vikas Thomson Publications

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 606 COMPUTER NETWORKS

Module 1

Evolution of Computer Networks

Types of Networks: Broadcast and Point-to-point, LAN, MAN, WAN, Wireless networks. Protocols & Standardization, ISO/OSI Reference model, TCP/IP Reference Model.

Application Layer

Application layer protocols:-WWW and HTTP, FTP, DNS, SMTP, SNMP, RPC, P2P File sharing, Domain Name system (DNS)

Module 2

Transport layer and *Network Layer*

Transport Layer Services, Relationship with Network Layer, Relationship with Application Layer, Multiplexing and De multiplexing, UDP, TCP: Header ,Segment Structure, Services, Connection establishment and termination, Flow control and window size advertising, TCP time out and re-transmission, Congestion Control, TCP Fairness, Delay Modeling.

Network layer Services, Datagram and Virtual circuit services, IP datagram format and Types of Services, Datagram encapsulation and Fragmentation, Reassembly and fragmentation

Module 3

Routing and Datalink Layer

Routing: Link state routing, distant vector routing, hierarchical routing, multicast routing, Data link layer services: Error detect and correction techniques, Elementary Data link layer protocols, sliding window protocols, HDLC ,Multiple access protocols, TDM, FDM, CDMA Random access protocols: ALOHA, CSMA,CSMA/CD,CSMA/CA. Circuit and Packet Switching, Virtual Circuits, Switching Technology for LAN, Ethernet switches, Virtual LAN

Module 4

Physical Layer, High speed Networks and Network programming

Physical Layer services, Transmission media, Data encoding schemes. ISDN, BISDN, Frame relay, Fast Ethernet and Gigabit Ethernet, FDDI, SONET .NETBIOS programming, TCT/IP and Socket programming. Network Performance: Analytical Approaches-Network Traffic Monitoring-simulations

Text Book:

1. Youlu Zheng and Shakil Akhtar, *Networks for Computer Scientist and Engineers,* Oxford University Press,2006
2. James F. Kurose and Keith W. Ross, Computer Networking – *A Top-Down Approach Featuring the Internet,2*/e Pearson Education ,2003

References:

1 S. Keshav, *An Engineering Approach to Computer Networki*ng, Pearson education ,2002
2 F. Halsall, *Data Communication, Computer Networks and Open Syste*ms, Addison Wesley, 1996
3 Andrew S. Tanenbaum, *Computer Networks* , 4/e, Pearson education, 2003
4 Behrouz A. Fourouzan ,*Data Communications and Networking,* 2/e Tat McGrawhill,2000
5 Leon-Garcia and I. Widjaja, *Communication Networ*ks, Tata McGraw Hill, 2000
6 Bertsekas and Gallagar , *Data Networ*ks, 2/e, PHI, 1992
7 Douglas E Comer ,Computer Networks and Internet's, 2/e Pearson Education,2004
5. Gallo, Computer Communication and Networking Technologies, Thomson Learning

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 607 SYSTEMS PROGRAMMING AND HARDWARE LAB

1. Identification of components/cards and PC assembling from components
2. Assembly language program for implementing arithmetic operations
3. Assembly Language programs for time and date manipulation.
4. Assembly Language programs for display /video manipulation
5. Assembly Language program for equipment status
6. Implementation of a file manager using DOS/BIOS interrupts
7. TSR (Terminate and Stay Resident) Programming
8. ADC interface
9 .Stepper Motor interface using DAC
10. Parallel Interface: Printer and HEX keyboard.
11. Serial Interface: PC to PC serial interface using null modem

Note: Programs can be implemented using MASM /TASM

References:

1. H. P. Messmer, *The Indispensable PC Hardware Boo*k, 3/e, Addison Wesley, 1997
2. S. J. Bigelow, *Troubleshooting, Maintaining, and Repairing PC*s, 2/e, Tata McGraw Hill, New Delhi, 1999
3. Douglas V. Hall, *Microprocessors and Interfacin*g, 2/e, Tata McGraw Hill, 1988
4. Ytha Yu and Charles Marut , *Assembly Language Programming and Organisation of IBM PC,* International Edition , McGrawhill Inc , 1992
6. Barry B. Brey , *The Intel Microprocessors 8086 to Pentium 4- Architecture Programming and Interfacing*, 6/e Pearson Education ,2003

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS 608 MINI PROJECT

The students are expected to develop an application using a standard DBMS package. They have to do a proper system study and prepare SRS and design documents.

Each batch comprising of 3 to5 students shall design. Each student shall submit a project report at the end of the semester. The project report should contain the design and engineering documentation including the Bill of Materials and test results. Product has to be demonstrated for its full design specifications. Innovative design concepts, reliability considerations and aesthetics / ergonomic aspects taken care of in the project shall be given due weight.

Guidelines for evaluation:

i) Attendance and Regularity	10
ii) Work knowledge and Involvement	30
iii) End-Semester presentation & Oral examination	20
iv) Level of completion and demonstration of functionality/specifications	25
v) Project Report	15
Total	100 marks

***Note**: External projects and R&D projects need not be encouraged at this level. Points (i) & (ii) to be evaluated by the project guide & co-ordinator and the rest by the final evaluation team comprising of 3 teachers including the project guide.*

CS/EB/EC/EE/EI/IT 701 INDUSTRIAL ORGANIZATION AND MANAGEMENT

Module 1

Organisation: Introduction, definition of organization, system approach applied to organization, necessity of organization, elements of organization, process of organization, principles of organization, formal and informal organization, organization structure, types of organization structure .

Forms of business organization: Concept of ownership organization, types of ownership. Individual ownership, partnership, joint stock Company, private and public limited company, co-operative organizations, state ownership, public corporation

Module 2

Basic concept of management: Introduction, definitions of management, characteristics of management, levels of management, management skills

Management theory: Scientific management, contribution of Gilbreth. Gantt, Neo-classical theory, modern management theories

Functions of management: Planning, forecasting, organizing, staffing, directing, motivating, controlling, co-coordinating, communicating, decision making.

Module 3

Personnel management: Introduction, definition, objectives, characteristics, functions, principles and organization of personnel management

Markets and marketing: Introduction, the market, marketing information, market segmentation, consumer and indusial markets, pricing, sales, physical distribution, consumer behaviour and advertisement.

Financial management: the basics , financial accounts, inflation, profitability, budgets and controls, cost accounting, valuation of stock, allocation of overheads, standard costing ,marginal costing

Module 4

Productivity and production: Measurement of productivity, productivity index productivity improvement procedure

Materials management and purchasing: Objectives, functions, importance of materials management. Stores and storekeeping

Inventory control: Classification, functions, inventory models, inventory costs, EOQ, Materials requirement planning

References:

1. Fraidoon Mazda, Engineering Management-, Addison -Wesley
2. Koontz and O'Donnell, Essentials of Management, Mc Graw Hill
3. Kotlar P, Marketing Management, Prentice Hall India
4. Prsanna Chandra , Finance Management,TMH.5th ed.,
5. Monks J.G Operations Management ,MGH

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 702 ADVANCED ARCHITECTURE & PARALLEL PROCESSING

Module 1

Introduction to Parallel Processing-Shared Memory Multiprocessing-Distributed Memory-Parallel Processing Architectures- Introduction-Parallelism in sequential Machines—Abstract Model of Parallel Computer – Multiprocessor Architecture- Array Processors.

Module 2

Pipelining and Super Scalar Techniques-Linear Pipeline Processors-Non-Linear Pipeline processors-Instruction pipeline design-Arithmetic pipeline Design- Super Scalar and Super pipeline Design.

Module 3

Programmability Issues-An Overview-Operating system support-Types of Operating Systems-Parallel Programming models-Software Tools-Data Dependency Analysis-Types of Dependencies-Program Transformations- Shared Memory Programming

Module 4

Thread –based Implementation-thread Management-Attributes of Threads- Mutual Exclusion with Threads- Mutex Usage of Threads- Thread implementation-Events and Conditions variables-Deviation Computation with Threads-Java Threads Distributed Computing –Message Passing Model-General Model-Programming Model- PVM-Algorithms for Parallel Machines- Debugging Parallel programming –Other Parallelism Paradigms .

Text Books:

1. Kai Hwang, “Advanced Computer Architecture: Parallelism, Scalability, Programmability”, McGRawHill International Edition, 1993.
2. M.Sasikumar, et.al., "Introduction to Parallel Processing", PHI, New Delhi, 2000

References:

1. P. Pal Chaudhuri , “Computer Organisation and Design”, PHI, New Delhi, 1994.
2. William Stallings, “Computer Organisation and Architechture”, PHI, New Delhi, 1996.
3. “Proceedings of Third International Conference on High Performance Computing”, IEEE, Computer Society Press , California, USA, 1996.
4. 4.“Parellel Processing”, Learning Material Series, Indian Society for Technical Education, New Delhi, 1996.
5. 5.V.Rajaraman, C. Siva Ram Murthy, "Parallel Computers Architecture and Programming", PHI, New Delhi, 2000
6. Parthasarathi, “Advanced Computer Architecture”, Thomson Learning.

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 703 ADVANCED COMPUTER NETWORKS

Module 1

Network Technologies : -WAN and LAN - Ethernet Technology: Fast And Gigabit Ethernet -10/100/1000 Ethernet - Properties of an Ethernet - interoperability & collision domains – Ethernet Hardware Addresses - Ethernet Frame Format - Extending An Ethernet With Bridges - Switched Ethernet -VLAN. Classful Internet Addresses: The Original Classful Addressing Scheme Dotted Decimal Notation - Subnet And Classless Extensions - IP Multicast Addresses .ARP: Resolution Through Direct Mapping - Resolution Through Dynamic Binding - ARP Protocol Format- ARP Implementation . RARP.

Module 2

Internet Routing: Routing Between Peers (BGP)-Routing Within An Autonomous System (RIP, OSPF).Internet Multicasting : Ethernet Multicast- IP Multicast- IGMP-DVMRP-PIM. Understanding Router Components: Ports-Queueing- Scheduling-shaping-policing-marking. QoS in IP networkk. IPv6: Frame formats-Comparison with IPv4. Introduction to ICMP,DHCP and NAT. Network Management: SNMP and RMON models

Module 3

Wireless transmission: Frequencies for radio transmission-Signals-Antennas-Signal propagation-Multiplexing-Modulation-Spread spectrum-Cellular systems. Medium access control: SDMA-FDMA-TDMA-CDMA-Comparison of S/T/F/CDMA.

Module 4

Telecommunications systems. GSM,:-System Architecture, Radio Interface, Protocols, Addressing-Call management and Handover. GGPRS and UMTS networks. Wireless LAN(WiFi): Infrared vs radio transmission-Infrastructure and ad-hoc network-IEEE 802.11a,b,g, 802.15 and 802.16 protocol standards –Bluetooth - Principle of WiMax . Mobile IP.

Text Books:

1. Douglas E.Comer, *Internetworking With TCP/IP Volume 1: Principles Protocols, and Architecture*, 5/e ,Prentice Hall,2006. (Module I and II)
2. Schiller, *Mobile Communication,* 2/e , Addison Wesley, 2005 (Module III and IV)

References:

1. Youlu Zheng and Shakil Akhtar, *Networks for Computer Scientist and Engineers,* Oxford University Press,2006
2. James.F.Kurose & Keith W.Ross , *Computer Networking –A Top Down approach featuring Internet,* 3/e, Pearson Education,2005.
3. Douglas E.Comer, *Computer Network and Internets, 2/e*, Person education ,2003.
4. Andrew S.Tanenbaum, *Computer Networks* ,$/e Edition,Pearson education,2003
5. William Stallings, *Wireless Communicatuion Networks*, 2/e, Pearson Education,2003.
6. Nathan J. Muller, Bluetooth Demystified, McGraw-Hill Professional Publishing,2000

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 704 DISTRIBUTED COMPUTING

Module 1

Characterization of Distributed systems – Introduction- Examples of Distributed Systems- Challenges-System Models –Architectural models-Fundamental Models – Interprocess communication-The API for the Internet protocols-External Data representation and Marshalling-Client Server Communication- group communication. Interprocess communication in UNIX. Distributed Objects and Remote Invocation – Communication between distributed objects-Remote Procedure Call- Events and Notifications- Java RMI, Case study

Module 2

Operating System Support-The Operating system layer – Protection- Processes and Threads-Operating System architecture

Distributed file Systems-Introduction-File Service architecture– Case study sun NFS. Name service SNS and DNS.

Module 3

Time and co-ordination. Synchronizing physical clocks -logical time and logical clocks. Distributed co-ordination –distributed mutual exclusion – elections. Replication – basic architectural model –consistency and request ordering.

Module 4

Distributed DBMS Architecture- Distributed Database Design –Query Decomposition and Data Localization -Distributed transactions – concurrency control in distributed transactions– distributed deadlocks – transaction recovery.

Text Book

1. George Coulouris, et. al., “Distributed Systems – Concepts and Design”, Third Edition., Addison Wesely, 2002

References

1. M.Tamer Ozsu,Patrick Valduriez, “Principles of Distributed Database Systems”, Second Edition ,Pearson Education.
3. C.A.R.Hoare, “Communicating Sequential Processes”, Prentice Hall, 1980
4. Dimitri P.Bertsekas, John N.Tsitiklis, “Parallel and Distributed Computation : Numerical Methods”,
5. Prentice Hall International, Inc., 1989
6. Douglas Comer and David L.Stevens, “Internetworking with TCP/IP Vol III: Client server Programming and Applications”, Prentice Hall, New York, 1990
7. Gerard Tel, “Introduction to Distributed Algorithms”, Cambridge University Press, 1994
8. H.S.M.Sedan, “Distributed Computer systems”, Butterworths, London, 1988
9. M.Sasikumar, et.al., "Introduction to Parallel Processing", PHI, New Delhi, 2000

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 705 A EMBEDDED SYSTEMS

Module 1

Overview of Embedded System:- Embedded System, Categories of Embedded System, Requirements of Embedded Systems, Challenges and Issues in Embedded Software Development, Applications of Embedded Systems in Consumer Electronics, Control System, Biomedical Systems, Handheld computers, Communication devices.

Module 2

Embedded Hardware & Software Development Environment: - Hardware Architecture, Microcontroller Architecture, Communication Interface Standards, Embedded System Development Process, Compilers and assemblers, Embedded Operating systems, Types of Embedded Operating systems.

Module 3

Introduction to Real Time Operating System **:** Task and task states,task and data, semaphore and shared data,message queues, mail boxes,pipes,time functions,events,Memory management,interrupt routines in RTOS environment,

Basic Design Using RTOS: Principle ,encapsulating semaphores and queues,hard real-time scheduling consideration,saving memory space,saving power,

Embedded software development tools: Host and Target machines, linker/ locator for embedded software,getting embedded software into a target system

Module 4

Real Time & Database Applications: - Real-Time Embedded Software Development, Sending a Message over a Serial Link, Simulation of a Process Control System, Controlling an Appliance from the RTLinux System, Embedded Database Applications using examples like Salary Survey, Energy Meter Readings.

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Text Books:

1. K.V.K.K Prasad,*Programming for Embedded System*s,Dreamtech Software Team, Wiley Dreamtech,2005
2. David E. Simon,An Embeded Software Primer, Pearson Education,2005

References:

1. Daniel W Lewis - Fundamentals of Embedded Software where C and Assembly Meet
3. K.V.K.K Prasad, *Embedded/RealTime systems: "Concepts, Design and programming",* Dreamtech Software Team, Wiley Dreamtech

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 705B INFORMATION RETRIEVAL

Module 1

Introduction – Information versus Data Retrieval. Modeling of Information retrieval. Formal characterization of Information retrieval – Alternate set theoretic models. Alternate algebraic models. Alternate probabilistic models. Structured text retrieval models. Models for Browsing. Retrieval Evaluation

Module 2

Query languages. Text Operations- Document pre processing. Text compression. Indexing and searching. Inverted files. Suffix trees and suffix arrays. Boolean queries. Sequential searching. Pattern matching.
Structural queries. User interface and visualization.

Module 3

Parallel and Distributed Information Retrieval. Implementation of inverted files, suffix arrays and signature files in MIMD architecture. Implementation of Inverted files, suffix arrays and signature files in SIMD architecture.

Module 4

Searhing the web – modeling the web . Search engines –architecture, user interfaces, ranking, crawling, indices. Web Directories-Metadata- Metasearchers-Web as graph-Hubs and Authorities- Case study - google search engine

Text Books:

1. Ricardo Baexa-Yates and Berthier Ribeiro-Neto, "Modern Information Retrieval", Addison Wesley Longman, 1999

References

1. Sergey Brin and Lawrence page, The anatomy of large scale hyper textual(Web) search engine, Computer Networks and ISDN systems, Vol 30,No 1-7
2. J Kleinberg, et. Al, The Web as a graph: Measurements, models and methods, Lecture notes in computer science , Springer Verlag, 1999

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/IT 705 C ARTIFICIAL NEURAL NETWORKS

Module 1

Introduction to neural networks. Artificial neural networks. Biological neural networks-Comparison , Basic building blocks of ANN. Activation functions. McCulloch-Pitts Neuron Model, Hebb net. Learning Rules-Hebbian Learning Rules, Perceptron, Delta, Competitive, Boltzmann. Perceptron networks- single layer, multilayer –algorithm.

Module 2

Feedback Networks, Discrete Hopfield nets, Continuous Hopfield nets. Feed Forward Networks: Back Propagation Networks, Learning Rule, Architecture, training algorithm. Counter Propagation Network: Full CPN, Forward only CPN, architecture, training phases.

Module 3

Adaptive Resonance Theory, architecture, learning in ART, Self Organizing feature maps: Kohonen SOM, Learning Vector Quantization, Max net, Mexican Hat, Hamming net. Associative memory networks Algorithms for pattern association Hetero associative networks, Auto associative memory networks Bidirectional associative memory networks Energy Function.

Module 4

Special networks: Probabilistic neural networks, Cognitron, Simulated Annealing, Boltzmann machine, Cauchy machine, Support Vector Machine Classifiers. Application of Neural networks In Image Processing and classification. Introduction to Fuzzy systems, Neuro fuzzy sytems.

Text books:

1. Laurene Fausett: *"Fundamentals of neural networks"*, Prentice Hall, New Jersey,1994.
2. James A. Freeman, David M. Skapure: Neural Networks Algorithms, Applications and Programming Techniques, Addison-Wesley, 1990.

References:

1. S N Sivanandan: *"Introduction to neural networks using "MATLAB"*, TataMcGrawHill, New Delhi.,2004
2. Kevin Gruney: "An Introduction to neural networks", CRC Press, 1997.
3. D. L.Hudson & M. E. Cohen: "*Neural Networks and Artificial Intelligence in Biomedical Engg."*, Prentice Hall Of India, New Delhi.,1999
4. James A. Anderson, "*An Introduction to Neural Networks", Prentice Hall of India,1995.*
5. Simon Haykin: "*Neural Networks"*, Pearson Education1998
6. Yegnanarayana: "*Artificial Neural Networks"*, Prentice Hall of India,2004.
7. Jack M. Zureda, *Introduction to Artificial Neural Systems,1992*

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 705D WEB-COMMERCE AND TECHNOLOGIES

Module 1

Introduction to SGML features HTML XML HTML vs XML simple XML documents XML tags , creating XML DTD s Displaying XML data in HTML Browser as HTML tables storing XML data in HTML document XML applications converting XML to HTML with XSL style sheets

Module 2

Java applets, java scripts, Java beans features ,designing Java Beans ,Properties of beans , creation of events , EJB basics ,types of beans ,development of session beans , steps creation and implementing interfaces

Module 3

Electronic payment systems electronic cash, wallets , smart cards ,web auction strategies , legal environment of e commerce SSL, Firewalls

Module 4

JSP creating JSP pages templating request and response objects, scriptlets .accessing beans via scriptlets

References

1. XML by Example :Building E Commerce application SEAN Mcgrath Pearson Education, Asia
2. Joseph L Weber PHI ,Using JAVA 2 Platform Special edition Java2 AWT Swing XML Java Beans
3. Steven HolznerWiley Dream, Tech Programming Black Book
4. Java Server Pages Larne Pekowsky Pearson asia
5. JSP Barry Burd IDG Books India
6. Mastering Enterprise Java beans and the Java2 platform enterprise Edition EdRoman (Wiley computer publishing)
7. EJB Design Patterns Floyd Marinescu
8. Raj Kamal TMH ,Internet and Web Technologies
9. Frontiers of E commerce Kalakotia Addison Wesley Publication
10. James T Perry Electronic Commerce By Gary P Schineder and Course Technology Thomson Learning Cambridge

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 706 LANGUAGE PROCESSOR LABORATORY

Students are expected to do the following exercises:

- Creation of Single Pass – Two Pass assembler – Macro processor.
- Generation of Lexical Analyzer using tools such as Lex
- Generation of Parser using tools such as YACC.
- Generation of LL(1) Parser
- Generation of intermediate code
- Creation of type checker
- Developing a compiler for a subset of a programming language.

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS 707 NETWORK AND OPERATING SYSTEMS LABORATORY

1. Study of system level calls of a suitable multitasking operating system. Exercises involving the system calls. (E.g. fork(), exec(), create(), etc. in UNIX.)
2. Inter process communication. Shared memory, messages, Semaphores and monitors. Implementation of typical problems(E.g. Bounded buffer, Dining Philosophers. etc.)
3. Study of Communication protocols. TCP/IP or a suitable protocol. Client server programming. Distributed algorithms. performance modelling of networks.
4. Internet programming using a suitable programming language and Operating system (E.g. JAVA)

References

1. Douglas E.Comer, Hands on Networking with Internet Technologies, Pearson Education
2. Bach, M.J., "Design of UNIX Operating System", Prentice Hall

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS 708 SEMINAR

Each student shall individually prepare and present a seminar on a topic of current relevance on a stipulated time. He/she should also submit a report of the same. Few panels consisting of two or three teachers (internal) each, should evaluate the seminar reoport and the presentation. Marks should be awarded considering report preparation, presentation, technical content, depth of knowledge, brevity and references and the participation in the seminar. The time allotted for each presentation is 30 minutes.

Students shall individually prepare and submit a seminar report on a topic of current relevance related to the field of Computers either hardware or software. The reference shall include standard journals, conference proceedings, reputed magazines and textbooks, technical reports and URLs. The references shall be incorporated in the report following IEEE standards reflecting the state-of-the-art in the topic selected. Each student shall present a seminar for about 30 minutes duration on the selected topic. The report and presentation shall be evaluated by a team of internal experts comprising of 3 teachers based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the seminar report

CS 709 PROJECT DESIGN

The project work shall commence in the seventh semester shall be completed by the end of eighth semester. Students are expected to identify a suitable project and complete the analysis and design phases by the end of seventh semester. For those students who are doing real life projects in the industry should also have both an external guide in the industry and an internal guide in the department. The internal guides are responsible for the continuous evaluation.

Each batch comprising of 3 to 5 students shall identify a project related to the curriculum of study. At the end of the semester, each student shall submit a project synopsis comprising of the following.

- Application and feasibility of the project
- Complete and detailed design specifications.
- Block level design documentation
- Detailed design documentation including circuit diagrams and algorithms / circuits
- Bill of materials in standard format and cost model, if applicable
- Project implementation action plan using standard presentation tools

Guidelines for evaluation:

i)	Attendance and Regularity	10
ii)	Quality and adequacy of design documentation	10
iii)	Concepts and completeness of design	10
iv)	Theoretical knowledge and individual involvement	10
v)	Quality and contents of project synopsis	10
	Total	50 Marks

Note: *Points (i)-(iii) to be evaluated by the respective project guides and project coordinator based on continuous evaluation. (iv)-(v) to be evaluated by the final evaluation team comprising of 3 internal examiners including the project guide.*

CS 801 SECURITY IN COMPUTING

Module 1

Introduction- Security problem in computing, Security in Networks. Elementary Cryptography- Introduction- Substitution and Transposition Ciphers.
Review of Number Theory-Modular arithmetic.

Module 2

Encryption Algorithms-Symmetric Key encryption- DES, AES.

Module 3

Public Key encryption. RSA Crypto System. Primality testing-
Miller-Rabin Algorithm. Diffie- Hellman Cryptosystem.

Module 4

Authentication protocols, Digital Signature, Secure e-mail, SSL, IP Security. System security –Intruders, Malicious Software , Firewalls.

Text book:

1. Stallings W. ,Cryptography and Network Security Principles and Practice 3/e Pearson Edition Asia 2003.

References:

1. W. Mao Modern cryptography : Theory and Practice , PEA ,2004
2. Handbook of Applied Cryptography, CRC Press 1996.
3. .Calabrese "Information Security Intelligence : Cryptographic Principles &Applications." Thomson Learning

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 802 ARTIFICIAL INTELLIGENCE

Module 1

Introduction - Problem spaces and search - Production systems - Characteristics. Heuristic search techniques - Generate and Test - Hill climbing -Best fit. Graph search - A* algorithm. Problem reduction - constraint satisfaction - Means and End analysis. Game playing - Minimax - Alpha-beta cut-off.

Module 2

Logic and Deduction. Introduction to symbolic logic - Propositional logic - Well Formed Formula. Predicate Logic - predicates variables and constants - First order logic, Quantifiers. Forward chaining and Unification. Goal trees. Resolution by refutation.

Module 3

Representing Knowledge. Procedural versus Declarative. Reasoning under uncertainty - Nonmonotonic reasoning - Statistical reasoning. Bayesian networks.. Fuzzy Logic . Semantic Nets, Frames, Conceptual Dependency, Scripts, CYC. Natural Language Processing - Transformational grammar, Case grammar - Semantic grammars. Learning: Learning by analysing, by explaining experience, by correcting mistakes, by recording cases

Module 4

Software agents – agent characteristics, agent topology, agent oriented programming, Java implementation of intelligent agents

Text Book:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw-Hill Publishing Company Ltd., New Delhi,1990
2. Jeffrey M Bradshaw, "Software Agents", AAAI Press/ The MIT Press(97)

References:

1. Natural Language Processing - Transformational grammar, Case grammar - Semantic grammars.
2. Dan W.Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall India Ltd., New Delhi, 1996
3. Winston, P.H., "Artificial Intelligence", Addison Wesley Pub. House, Reading, MA
4. Nillson N. J., "Artificial Intelligence: A new Synthesis", Elsevier, New Delhi
5. Eugene Charmiak, Drew McDermott, "Introduction to Artificial Intelligence", Addison Wesley , Reading, Massachusetts, 1985
6. Akshar Bharati, Vineet Chaitanya, Rajeev Sangal, "Natural Language Processing: A Paninian Perspective", Prentice Hall India Ltd., New Delhi, 1996
7. Nils J.Nillson, 'Principles of Artificial Intelligence", Morgan Kauffman Publishers Inc., Palo Alto, California
8. Rober J,. Schalkoft, "Artificial Intelligence, An Engineering Approach", McGraw-Hill Publishing company, New York 1990
9. Gerhard Weiss, "Multi agent System – A modern approach to distributed AI", MIT Press

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 803 OBJECT ORIENTED MODELLING AND DESIGN

Module 1
Object Oriented Programming and Design Principles: Object Oriented Concepts – Nature and purpose of models – Object Modeling – Dynamic Modeling – Functional Modeling System Design- Object Design

Module 2
UML Structural Modeling: Basics of UML based object oriented analysis and design Classes – Relationships – Interfaces – Roles – Class diagrams – Advanced classes and relationship – Packages – Instances – Object diagrams

Module 3
UML Behavioral Modeling: Interactions – Use cases – Interaction diagrams – Use case diagrams – Activity diagrams – Events – Signals – State Machines – Processes – Threads – State chart diagrams

Module 4
UML Architectural Modeling: Component diagrams – Deployment diagrams – Collaborations – Unified Processes Introduction to Software Architecture: Design frameworks – Design pattern – Describing the architecture in Architecture description language (ADL)

Text Book:
1. James Rambaugh et. al., Object Modelling and Design –PHI
2. Grady Booch, James Rambaugh,Ivar Jacobson .A.WThe Unified Modeling Language User Guide –

References:
1. Ivan Jacobson, Grady Booch, James Rambaugh A.W The Unified Software Development Process –
2. Bruegge. Object Oriented Software Engineering using UML patterns and Java,Pearson Education ,2003 –
3. Rational Unified Process, Third Edition – Kruchten.

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EC/EE/EI 804 A DIGITAL IMAGE PROCESSING

Module 1

Digital image fundamentals: representation - elements of visual perception - simple image formation model - Image sampling and quantization - basic relationships between pixels – imaging geometry. Review of matrix theory results: Row and column ordering - Toeplitz, Circulant and Block matrices. Review of Image transforms: 2D-DFT, FFT, Walsh, Hadamard , Haar, DCT and Wavelet transforms.

Module 2

Image enhancement: Spatial domain methods: point processing - intensity transformations, histogram processing, image subtraction, image averaging; Spatial filtering- smoothing filters, sharpening filters. Frequency domain methods: low pass filtering, high pass filtering, homomorphic filtering. Generation of spatial masks from frequency domain specifications.

Image segmentation: Detection of discontinuities - point, line and edge and combined detection , Edge linking and boundary description - local and global processing using Hough transform – Thresholding - Region oriented segmentation - basic formulation, region growing by pixel aggregation, region splitting and merging - Use of motion in segmentation. Fundamentals of Representation and Description.

Module 3

Image restoration: Degradation model - Diagonalization of circulant and Block circulant matrices - Algebraic approaches - Inverse filtering - Wiener filter - Constrained Least squares restoration - Interactive restoration - Geometric transformations. Fundamentals of Colour image processing: colour models - RGB, CMY, YIQ, HIS - Pseudo color image processing - intensity slicing, gray level to color transformation.

Module 4

Image compression: fundamentals- redundancy: coding, inter pixel, psychovisual, fidelity criteria, Models, Elements of information theory, Error free compression- variable length, bit plane, lossless predictive, Lossy compression- lossy predictive, transform coding. Fundame ntals of JPEG, MPEG, Fractals.

Text Book:

1. Gonzalez and Woods, “Digital Image Processing”, 2 Ed, Pearson Education, 2002.

References:

1. Anil K. Jain, “Fundamentals of Digital Image Processing”, Pearson Education, 2003.
2. Mark Nelson, Jean-Loup Gailly “The Data compression Book” 2 Ed, bpb Publications.
3. Pratt William K.,”Digital Image Processing”, John Wiley & sons
4. Chanda & Majumdar, “Digital Image Processing and Analysis” , PHI.
5. M.Sonka,V. Hlavac, R. Boyle, “Image Processing, Analysis and Machine Vision”, Vikas Publishing House

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/EB/EC/IT 804 B BIOINFORMATICS

Module 1

Basic Concepts of Molecular Biology: Cells - Chromosomes, DNA, RNA, Proteins, Central dogma of molecular biology, Genomes and Genes - Genetic code, Transcription, Translation and Protein synthesis. Web based genomic and proteomic data bases: NCBI, GenBank

Module 2

Sequence alignments – Dot plot-Pair-wise sequence alignments - local and global - Sequence similarity and distance measures - Smith-Waterman algorithm, Needleman-Wunch algorithm, Multiple sequence alignment –Sum-of-Pairs measure - Star and tree alignments – PAM and BLOSUM, Phylogenetic analysis

Module 3

Informational view of Genomic data, Genomic Signal Processing, DNA Spectrograms, Identification of protein coding regions, Gene expression, Microarrays, Microarray image analysis

Module 4

Gene structure in Prokaryotes and Eukaryotes: Molecular Structure Prediction: Basic concepts and terminologies related to molecular structures, Basic molecular Visualization, RNA secondary structure prediction, Protein folding problem, Protein Threading, Protein Visualization, Introduction to Drug Discovery.

Case Study

Software Tools: Use of Tools for basic and specialized sequence processing such as: BLAST, FASTA, RasMol, Phylip, ClustalW

Text Books:

1. Setubal & Meidanis, *Introduction to Computational Molecular Biology*, Thomson:Brooks/Cole, International Student Edition, 2003
2. Claverie & Notredame, *Bioinformatics - A Beginners Guide*, Wiley-Dreamtech India Pvt Ltd, 2003.

References:

1. Lesk, *Introduction to Bioinformatics*, Oxford University Press, Indian Edition, 2003
2. Higgins and Taylor, *Bioinformatics: Sequence, structure and databanks*, Oxford University Press, Indian Edition, 2003
3. Bergeron, *Bioinformatics Computing*, Prentice hall of India, 2003
4. Jiang, Xu and Zhang, *Current topics in Computational Molecular Biology*, Ane Books, New Delhi, 2004
5. S.C Rastogi & Namitha Mendiratta, *Bioinformatics method and application Genomics,Protinomics & drug discovery*
6. Dov Stekel, *Microarray Bioinformatics* ,Cambridge University Press

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 804 C SOFTWARE ARCHITECTURE

Module 1

Software Architecture –Introduction-Architectural Styels-Pipes and Filters-Data Abstraction and Object Oriented Organization-Event based, Implicit Invocation-Layered Systems-Repositories-Interpreters-Process Control-Process control Paradigms-Software Paradigm for Process Control-Distributed processes-Main program / subroutine organizations – Domain – specific software architecture – heterogeneous architectures .

Module 2

Shared Information Systems – Data base integration –Batch sequential – Simple Repository –Virtual Repository – Hierarchical Layers – Evolution of Shared Information Systems in BusinessData Processing – Integration in Software Development Environments – Integration in Design of Buildings- Architectural Structures for Shared Information Systems.

Module 3

Architectural Design Guidance- Guidance for User-Interface Architectures -Design Space and rules-Design Space for User Inter face Architectures-Design. Rules for User Interface Architecture applying the Design Space – Example – A Validation Experiment – How the Design Space Was Prepared .

Module 4

Value of Architectural Formalism – Formalizing the Architecture of a Specific System – Formalizing an Architectural Style – Formalizing an Architectural Design.Linguistic Issues – Requirements for Architecture - Description Languages - First Class Connectors – Adding Implicit Invocation to Traditional Programming Languages .
Tool for Architectural Design – UniCon .

Text Book:

1. Mary Shaw, David Garlan, "Software Architecture", Prentice Hall ,India, 2000

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 804(D) MOBILE COMPUTING

Module 1

Review of wireless and mobile communication (covered in Advanced Computer Networks)-Mobile computing architecture-Pervasive Computing-Voice oriented data Communication, Operating System for Mobile Computing, Mobile Devices, cards and sensors, Mobile computing applications: messaging-SMS-MMS-GPRS applications-Mobile agents.

Module 2

Wireless Internet-Mobile IP-wireless web-Web services and mobile web services-Wireless middleware-wireless gateway and mobile application servers-Wireless Access Protocol(WAP)-WAP protocol layers. Mobile database management:-data caching, transaction models, processing queries, Data recovery, QoS .Mobile Transport Layer

Module 3

Cellular network- First Generation Networks-Second generation (2G): GSM-CDMA network .data over cellular network-2.5G network-GPRS-GPRS System Architecture and Protocol layers. EDGE. Third generation network(3G) network-MMS-introduction to 4G and 5G systems-Emerging wireless networks: Ultra wide band(UWB)-Free space optics(FSO)-Mobile ad-hoc network(MANET)-Wireless sensor networks-OFDM and Flash OFDM

Module 4

Wireless security-WLAN security-cellular wireless network security-Mobile ad-hoc network security-Internet security protocols: VPNs and IPSec-Wireless middleware security-SSL for wireless web security-WAP security and WTLS. Client programming tools-using XML and UML for mobile computing –J2ME.

Text Book:

1. Raj Kamal, *Mobile Computing,* Oxford University Press, 2007

References:

1. Amjad Umar, Mobile Computing and Wireless Communications,NGE Solutions,2004
2. Asoke Talukder,Roopa Yavagal, Mobile Computing,McGrawhill,2006
3. Reza Behravanfar, Phillip Lindsay, Reza B'Far, Mobile Computing Principles: designing and developing mobile applications with UML and XML,Cambridge University Press,2006.
4. U. HansMann, L Merk, M.S. Nicklous and T. Stober, Principles of Mobile Computing, 2/e, Spniyer, 2003
5. Schiller J, Mobile Communications, 2/e-Addison Weslay,2003.

Type of questions for University Examination
Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module
Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 805 PROJECT WORK

The project work commencing from the seventh semester shall be completed and the project report shall be submitted by each student by the end of eighth semester. There shall be an internal examination of the project that includes a presentation, demonstration and oral examination of the project work. The evaluation panel shall consist of at least two faculty members including project guide as appointed by the Head of the department.

Each batch of students shall develop the project designed during the VII semester. The implementation phase shall proceed as follows:

A detailed algorithm level implementation, test data selection, validation, analysis of outputs and necessary trial run shall be done.
Integration of hardware and software, if applicable, shall be carried out.
A detailed project report in the prescribed format shall be submitted at the end of the semester. All test results and relevant design and engineering documentation shall be included in the report.
The work shall be reviewed and evaluated periodically

The final evaluation of the project shall be done by a team of minimum 3 internal examiners including the project guide and shall include the following.

- Presentation of the work
- Oral examination
- Demonstration of the project against design specifications
- Quality and content of the project report

Guidelines for evaluation:

Regularity and progress of work	30
Work knowledge and Involvement	100
End semester presentation and oral examination	50
Level of completion and demonstration of functionality/specifications	70
Project Report – Presentation style and content	50
Total	300 marks

Note: *Points (i) and (ii) to be evaluated by the respective project guide and the project coordinator based on continuous evaluation. (iii)-(v) to be evaluated by the final evaluation team comprising of 3 internal examiners including the project guide.*

CS 806 VIVA-VOCE

Each student is required to appear for a viva-voce examination, and he/she has to bring his seminar report and project report for the same. The evaluation panel should contain at least one external and two internal examiners appointed by the University. There can be more than one panel in case the number of students is large.