**B.TECH DEGREE COURSE IN COMPUTER SCIENCE & ENGINEERING (2012 Admissions)**

**SCHEME OF EXAMINATIONS**

**SEMESTER I & II (Common to all branches)**

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**Elective I:**
- CS 1606 E1: Software Testing
- CS 1606 E2: System Modeling & Simulation
- CS 1606 E3: Security in Computing
- CS/IT 1606 E4: Embedded Systems
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**Elective II:**
- CS 1705 E1: Software Project Management
- CS 1705 E2: Information Retrieval
- CS 1705 E3: Grid Computing
- CS/IT 1705 E4: Neural Networks

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**Elective III:**
- CS 1804 E1: Operations Research
- CS 1804 E2: Data Mining
- CS 1804 E3: Mobile Computing
- CS 1804 E4: Agent Based Intelligent Systems
Module I
Ordinary differential equations:

First order differential equations - exact differential equations, Bernoulli’s equations--Methods of solution and Simple applications.


Module II
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: 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 III
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.

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

Module IV
Integral calculus:
Application of definite integrals: Area, Volume, Arc length, Surface area.
Applications of multiple integrals. Plane Area, Surface area &Volumes of solids

References:
1. S.S.Sastry, Engineering Mathematics -Vol1, PHI publishers
2. Erwin Kreyzig, Advanced Engineering Mathematics, Wiley Eastern

Type of Questions for University Exam,
Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)
Q 2. to Q 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)
Module I
Holography—basic principle-Comparison with ordinary photography-Recording and reconstruction of holograms-applications.

Module II
Crystallography – Space lattice- Basis- Unit cell- Unit cell parameters- Bravais lattices- Three cubic lattices-sc, bcc, and fcc- Number of atoms per unit cell- Co-ordination number- Atomic radius-Packing factor- Relation between density and crystal lattice constants- Lattice planes and Miller indices-Separation between lattice planes in sc- Bragg’s law- Bragg’s x-ray spectrometer- Crystal structure analysis.
Liquid crystals- Liquid crystals, display systems-merits and demerits- Metallic glasses- Types of metallic glasses (Metal-metalloid glasses, Metal-metal glasses) – Properties of metallic glasses (Structural, electrical,magnetic and chemical properties). Shape memory alloys- Shape memory effect, pseudo elasticity

Module III
Introduction to nanoscale science and technology- nanostructures-nanoring, nanorod, nanoparticle, nanoshells- Properties of nanoparticles- optical, electrical, magnetic, mechanical properties and quantum confinement- Classification of nanomaterials- C60, metallic nanocomposites and polymer nanocomposites- Applications of nanotechnology.

Module IV
Quantum mechanics-Introduction-origin of quantum theory-black body radiation and photo electric effect (brief ideas only)-matter waves- wave packet-uncertainty principle-(two forms)Time dependent Shrodinger equation for a free particle-Particle in force field and time dependent Schrodinger equation-Time independent schrodinger equation-Physical intrepretation of wave function-application -Particle in a Box (one dimensional) –Energy eigen values and wave functions Ultrasonics-piezo electric effect-Magnetostriction effect-production of ultrasonics-properties of ultrasonics- ultrasonic diffractometer and determination of velocity of ultrasonics in a liquid-Application of ultrasonics in non destructive testing - Acoustics of building-reverberation- Absorption Coefficient- Sabines formula for reverberation time(Derivation)-Acoustic intensity- loudness-decibel-phon-conditions for good acoustics(Qualitative study).

References:
2. M.C. Santosh Kumar, Engineering Physics, Nalpat Publishers.
7. G.S. Raghuvanshi, Engineering Physics, Prentice Hall of India.
**Type of Questions for University Exam.**

Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)
Module I

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.

Spectroscopy: Molecular energy levels-Types of molecular spectra- Electronic spectra (Classification of electronic transitions- Beer Lamberts law, Vibrational spectra (mechanism of interaction and application), Rotational spectra (Determination of bond length and application), NMR spectra (Basic principle, chemical shift, spin-spin splitting)

Solid surface characterisation: Electron spectroscopy for chemical analysis, Chemical shift, BET isotherm, Thermodynamics of adsorption.

Module II


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.

Module III

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.

Phase Rule: Terms involved in phase rule and examples, Application of phase rule to one component water system, Application of phase rule to two-component systems.

Module IV

Engineering materials:


References:


Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)
A) STATICS

Module I

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


B) DYNAMICS

Module III

Module IV


References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)
Q 2. to Q.5: Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)
Module I
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 II
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 III
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 IV
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 V
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.

References:
3. N.D.Bhat, Elementary Engineering Drawing, Charotar publishing house
4. P.S.Gill, Geometric Drawing, B.D Kataria &Sons, Ludhiana

University Examination Question Paper pattern
Two questions of 20 marks each from all the five modules. Answer one question from each module. (5x20 = 100 marks)
Module I

**Engineering Materials:** Cement - varieties and grade of cement and its uses. Cement mortar- Steel- types of steel for reinforcement bars, steel structural sections. Brick- varieties and strength, tests on bricks.

**Aggregates:** types & requirements. 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- Foundation for Machinery

**Module II**

Super structure: Brick masonry, English bond and Flemish bond, Stone masonry-Ashlar masonry- 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.

**Leveling:** Leveling instruments, different types, temporary adjustments, mean sea level, reduced level of point, booking of field notes, reduction of levels by height of collimation method.

**References:**
2. Roy M. Thomas, Fundamentals of Civil Engineering, Educational Publishers, Ernakulam
5. P. Kanetkar, Surveying and Levelling, Volumes 1 and 2, United Book Corporation, Poona.

**PART A - Type of Questions for University Exam.** (Maximum Marks: 50) (To be answered in separate answer book)

1. Four short answer questions of 5 marks each with two questions from each module. (4x5 = 20 marks)
2. to Q.5 : Two questions A & B of 15 marks from each module with option to answer either A or B. (2 x 15 = 30 marks)

**PART – B: BASIC MECHANICAL ENGINEERING**

Module I

**Thermodynamics:** Thermodynamics systems – open, closed and isolated systems, equilibrium state of a system, property and state, process, cycle, Zeroth law of thermodynamics- concept of temperature, temperature scales. First law – internal energy, enthalpy, work and heat, Different processes, isobaric, isochoric, isothermal and adiabatic processes Second law – Kelvin-plank and Claussius statements, Carnot Cycle.

**Internal Combustion Engines:** Air standard cycles – Otto and Diesel cycles, working of two stroke and four stroke Petrol and Diesel engines, Carburatted and MPFI engines, fuel pump, fuel injector, ignition system, cooling system, lubricating system.

Module II

**Refrigeration and Air conditioning:** Vapour compression and vapour absorption refrigeration systems, summer, winter and comfort air conditioning.

**Manufacturing processes** – Casting (sand and die casting processes), Forging (open & closed die forging), Rolling, Extrusion, Welding (resistance, arc and gas), brazing and soldering

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

**Transmission of power:** Belt drives (open and closed), Chain drives.

**References:**
2. J.P. Holman, Thermodynamics, McGraw Hill
3. Rogowsky, Elements of Internal combustion Engines, Tata McGraw Hill
5. Stoeker, Refrigeration and Air Conditioning, Tata McGraw Hill
6. Raghavan : Material Science and Engineering, Prentice Hall of India

**PART B - Type of Questions for University Exam.** (Maximum Marks: 50) (To be answered in separate answer book)

1. Four short answer questions of 5 marks each with two questions from each modules. (4x5 = 20 marks)
2. to Q.5 : Two questions A & B of 15 marks from each module with option to answer either A or B. (2 x 15 = 30 marks)
Module I


**Capacitors** : The Electric Field – Capacitance – Capacitors, **Inductors** : Magnetic Field – Inductance.

Module II


**The Basic Elements and Phasors** : Response of Basic R, L and C Elements to a Sinusoidal Voltage or Current – Frequency Response of the Basic Elements – Average Power and Power Factor – Complex Numbers – Rectangular Form – Polar Form – Conversion between Forms.


**Introduction to 3 phase Systems** : StarA Connection


**PART- B: ELECTRONICS ENGINEERING**

Module III

**The Diode** - Biasing the Diode, Voltage - Current Characteristic of a Diode, Diode Models, **Diode Applications** - Half Wave and Full Wave Rectifiers, Power supply Filters and Regulators, **Special Purpose Diodes** - Zener Diodes- Applications, Varactor Diodes, Optical Diodes-Other Types of Diodes. **Bipolar Junction Transistors (BJTs)** - Transistor Structure - Basic Transistor Operation, Transistor characteristics and parameters, Transistor as an Amplifier, Transistor as a Switch.

Module IV

**Sensors** - Temperature, light, force and sound sensors; **Actuators** – Heat, Light, force and sound actuators.

**Electronic measurements** - measurements of voltages and currents, voltmeter, ammeter, multimeter, CRO (Block level treatment only)

**Introduction to Electronic Communication systems** : Modulation and Demodulation, Analog communication system, Electromagnetic frequency spectrum, Bandwidth and information capacity, Principles of Amplitude and angle modulation, Bandwidth requirements of angle modulated waves.

**Optical communication** : Fundamental concepts, Block diagram of an optical fibre communications system.

**Cellular Telephone** : Fundamental concepts, Frequency reuse, Block diagram of a simplified cellular telephone system, Roaming and handoffs

**Satellite communication** : Block diagram of Satellite system link models – Uplink, Transponder Downlink.

**Reference:**

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5: Two questions A & B of 15 marks from each module with option to answer either A or B. (4x15 = 60 marks)
1108 COMPUTER PROGRAMMING

Module I
Basics of Computer and Information Technology:

Problem Solving Methodology:
Program - Programming Process ( Problem statement, Analysis, Design a solution, Implement/Coding the solution, Test the solution, Iteration through the phases to refine/correct the program)- Design tools (Algorithm, Flow-chart, Pseudo-code)- Develop algorithms for simple problems.

Module II
Programming Languages:
Types and generation of programming languages- Compiler – Interpreter-Linker –Loader –Execution of Program
Basics of C:
Character set- Identifier- Keywords- Constants –Data Types- Variables and declaration –Operators and Expressions – Operator precedence and associativity – Expression Evaluation (Simple Examples) - Input and output functions – Simple computational problems involving the above constructs.

Module III
Control Statements:
Selection, Conditional operator, Iteration (for, while, do-while), Branching (switch, break, continue, goto), Nesting of control statements- Problems using control statements.

Arrays and Strings:
1D and 2D arrays –Searching (Linear and Binary) – Sorting (Bubble, Selection) – Matrix manipulation programs – Strings and basic operations on strings – Strings functions - Programs on string manipulation

Functions:
Definition – Calling – Declaration – Parameter Passing (by value and by reference) – Recursion – Library functions – Programs based on functions

Module IV
User defined data types:
Structure – Union - Enumerated data type - Programs involving structure and union.

Pointers:
Declaration, Initialization – Pointers and arrays – Pointers and structures – Pointers and functions – Command line arguments – Dynamic memory allocation – Operations on pointers – Programs involving the above concepts

Files:
File concept – File pointer – File handling operations (open, close, read, write etc) on sequential and random access files. Programs on file manipulations using fgetc(), fgets), fseek.

References:
2. Samarjit Ghosh, All of C, PHI Learning
5. R G Dromey, How to solve it by Computer, Prentice Hall
8. Sukhendu Dey, Complete Knowledge in C, Narosa
9. Varghese Paul, Computer Fundamentals, EPD.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)
Module I

Natural resources - issues related to the use and over exploitation of forest resources, water resources, mineral resources, food resources, energy resources and land 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. Threats to biodiversity, Conservation of biodiversity.

Module II

Environmental Pollution - 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. Disaster Management: Floods, earth quake, cyclone and landslides. Role of public awareness in disaster management.

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, case studies - Population growth and problems of population explosion - Environment and human health - Human rights - Value education - Role of Information Technology in environment and human health - Environmental ethics: issues and possible solutions.

References:
2. Erach Bharucha, Textbook of Environmental Studies and Ethics, Universities Press (India), Hyderabad, 2005.

PART – B: TECHNICAL COMMUNICATION (1 hour / week)

This is a practice oriented, need based, and functional – communicative course. It is intended to develop the student’s skill of communication in listening, speaking, reading and writing. The student is advised to cultivate the habit of reading newspapers, magazines and books in a free, extensive manner to consolidate the skill already achieved. A more inter-active process of teaching/learning is called for in order to achieve effective communication.

Questions at the class tests and semester end examination will be largely problem solving and application oriented in nature.

Module I

Communicative Grammar: Time, tense and aspect; Verbs of state and event; Use of preposition; Expressing emotions and attitudes: Hope, anticipation of pleasure, disappointment, approval, disapproval, surprise.

The sounds of English: (it is not a course in phonetics. Technical terms will not be used except when absolutely necessary.)

Length of vowels-long and short vowels
| /ɪː/ | /ɪ/ | /ɔː/ | /ɑː/ | /ʌ/ | /ʊ/ |
| /f/ | /v/ | /θ/ | /ð/ | /s/ | /z/ |
- Consonants: /f, v, s, z, 3/- Stress pattern -
- Intonation: falling and rising.

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; interviews; group 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 II**

**Written Communication:** note making and note taking; summarizing; notes and memos; developing notes into text; organization of ideas: cohesion and coherence; Preparing notes – writing business letters and E-mail messages. Organizing a meeting, preparing an agenda, chairing a meeting, drafting motions and resolutions, writing minutes.

Paragraph writing: Paragraph writing – Topic sentence, cohesion and coherence- sentence liners (so, but, however etc), 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. Preparation of a business report-writing a business proposal - format, length,structure.

Spelling rules and tips; writing a rough draft; editing and proof reading; writing the final draft; styling text; filling in complex forms; standard letters; Writing a curriculum vitae (both chronological & functional) along with an application for a job; Public relation – Concept and relevance – PR in a business organization-handing the media; 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.

**References :**

**University Examination Pattern**

The question paper will have two parts. Part A and Part B will have a weightage of 50 marks each and they will have to be answered in separate answer books.

**Question Paper Pattern for Part A (Environmental Studies)**

Q I. – 6 short type questions of 3 marks each, with three questions from each module (6 x 3 = 18)

QII. – 2 questions A and B of 16 marks from Module I with choice to answer one. Both A and B should have a minimum of two sub – sections.

QIII - 2 questions A and B of 16 marks from Module II with choice to answer one. Both A and B should have a minimum of two sub – sections.

**Question Paper Pattern for Part B (Technical Communication)**

Q I – 10 short answer questions of 2 marks each, with five questions from each module. The questions shall be problem solving and application oriented in nature. (10x2 = 20 marks)

QII. – 2 questions A and B of 15 marks from Module I with choice to answer one. Both A and B should have a minimum of two sub – sections. The questions shall be problem solving and application oriented in nature.

QIII - 2 questions A and B of 15 marks from Module II with choice to answer one. Both A and B should have a minimum of two sub – sections. The questions shall be problem solving and application oriented in nature.
11 L1 ELECTRICAL AND MECHANICAL WORKSHOP

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.
10. Soldering practice.
11. Familiarisation of CRO.

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

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
11 L2 COMPUTER PROGRAMMING LABORATORY

Application packages

Word
1. To create an advertisement in Word.
2. To illustrate the concept of mail merging in word.

Spread Sheet
3. To create a spread sheet to analyse the marks of the students of a class and also to create appropriate charts.

Power Point
4. To create the presentation for the department using Power Point.

C Programming Basics

Operators & Expressions
5. To write a simple menu driven calculator program using switch statement

IO Formatting
6. To write a program to print Pascal’s triangle.

Decision Making
7. To write a program for electricity bill preparation.

Looping
8. To write a program to print the sine and cosine series.

Arrays
9. To write a program to perform Matrix multiplication.
10. To write a program to prepare and print the sales report.

String
11. To write a program to perform string manipulation manipulations function like string concatenations, comparison, find the length and string copy without using library functions.
12. To write a program to arrange names in alphabetical order.

Functions
13. To write a C program to calculate the mean, variance and standard deviation using functions.
14. To write a C program to perform sequential and binary search using functions.

Recursion
15. To write a program to print the Fibonacci series and to calculate the factorial of the given number using functions.

Structures
16. To print the mark sheet of n students using structures.

Pointers
17. To write a program using pointers to access the elements of an array and count the number of occurrences of the given number in the array.

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

**Objectives:**
1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

**SYLLABUS:**

The following course content is prescribed for the English Language Laboratory sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
5. ‘Just A Minute’ Sessions (JAM).
6. Describing Objects / Situations / People.
7. Information Transfer
8. Debate
10. Giving Directions.

*Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.*
Module I
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 (non proof).

Module II
Fourier series and Fourier integrals: Fourier series of Periodic functions- Euler formulae for Fourier coefficients- functions having period $2\pi$, 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 III
Laplace transforms: Linearity property, transforms of elementary functions, Laplace transforms of derivatives and integrals, differentiation and integration of transforms, convolution theorem (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 IV
Vector calculus: Scalar and Vector point functions-Gradient and directional derivative of a scalar point function- 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.

References:
3. Larry C Andrews, Ronald C Philips, Mathematical Techniques for Engineers & Scientists, PHI Publishers

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1302 LOGIC DESIGN

Module I
Boolean algebra and logic gates: Axiomatic definition of boolean algebra-Basic theorems and properties-Boolean functions-Canonical and standard forms-Logic operations-Digital Logic gates
Gate level minimisation: Karnaugh map-two,three, four and five variable maps-POS simplification-Don't care conditions-NAND and NOR implementation-Exclusive OR function-QuineMcClusky Technique

Module II
Synchronous sequential circuits: Sequential circuits-Latches and Flipflop-Analysis of clocked sequential circuits-State reduction and analysis-Design procedure

Module III
Registers and Counters: Registers-Shift Registers-Ripple counters-Synchronous counters-Counter with unused states-Ring counter-Johnson counter
Memory and Programmable Logic: Random Access Memory-Memory decoding-Error detection and correction-Read Only Memory-Programmable Logic Array-Programmable Array Logic-Sequential programmable devices

Module IV
Asynchronous Sequential circuits: Analysis procedure-Circuits with Latches-Hazards

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/IT 1303 DISCRETE COMPUTATIONAL STRUCTURES

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

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

Module III
Graph theory, paths and cycles, Hamiltonian cycles, representation of graphs, Eulerian paths, traveling salesman problem, trees, characterization, spanning trees, game trees.

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

References:
6. G.Suresh Singh - Graph Theory, PHI Learning.
8. Bernard Kolman, Robert C Busby, Sharon Cutler Ross, Nadeem-ur-rehman Discrete mathematical structures, Pearson Education.
9. J P Tremblay and Manohar Mc Graw Hill - Discrete mathematical structures with applications to computer science -

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
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 II
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 III
Inheritance, types of inheritance, virtual base class, abstract class, advantages and disadvantages of inheritance, pointers and arrays, C++ and memory

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

References:
4. Programming a Practical Approach, Madhusudan Mothe, Pearson Edn
5. C++ Programming :From Problem Analysis To Program Design, Malik, Thomson Learning

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS1305 PRINCIPLES OF PROGRAMMING LANGUAGES

Module I

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

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
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- Enhancement and depletion types - NMOS, PMOS and CMOS -basic principles & characteristics.

Module II

Module III
Power amplifier - classification - class A, B, AB and C power amplifiers-tuned amplifier- pushpull and complementary symmetry power amplifier . 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 circuits using BJTs-applications

References:
3. Taub & Schilling, Pulse, Digital and Switching circuits, TMH, New Delhi

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 13L1 ELECTRONICS CIRCUITS LABORATORY

1. Study of Multimeter, Signal generators, CRO etc. and measurement of electrical quantities
2. Testing of Passive and Active components - Resistors, Capacitors, inductors, Transformers, diodes, Transistors, etc.
3. Characteristics of Active devices – Diode, CE of BJT
4. Rectifying circuits
   i) HW rectifier
   ii) FW rectifier
   iii) FW Bridge rectifier
   iv) Filter circuits - Capacitor filter,
       (Measurement of ripple factor)
5. Differentiating circuit and integrating circuit.
6. Clipping & Clamping circuits.
7. Amplifying circuits Simple common emitter amplifier configuration - gain and bandwidth.
8. Oscillators – RC phase shift or Wein Bridge
9. Multivibrators – Astable only.

Note: 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.
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

References:

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
Module I
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 factional transformations, mapping by elementary function like $Z^2$, $e^z$, sin $z$, cos $z$, sin $hz$, and Cos $hz$, $Z + 1/Z$

Module II
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 III
Partial differential equations:
Formulation of partial differential equations.
Solutions of equations of the form $F(p,q) = 0$, $F(x,p,q) = 0$, $F(y,p,q) = 0$, $F(z,p,q) = 0$ $F_1(x,p) = F_2(y,q)$.
Lagrange’s form $Pp+Qq = R$
Linear homogeneous partial differential equations with constant co-efficient

Module IV
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.

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
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 II
Assembly Language Programming: 8085 instruction set: Instructions, Classifications, Addressing modes, Stack and Subroutines, Delay routines, Counters etc. Programming examples.

Module III
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 IV
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 organization, initialization, hardware and software interface to 8085).

References:
3. Nagoor Kani, Microprocessors, architecture and programming, RBA Publications, 2004
5. S. P. Chowdhuray, Sunetra Chowdhuray, Microprocessors and Peripherals, SCITECH, 2004
6. Ghosh and Sridhar: Microprocessors for Engineers and Scientists, PHI, 2nd ed.

Type of Questions for University Exam:
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
Module I
Basic structure of computers – Functional units – Basic operational concepts – Bus structures – Instructions & instruction sequencing. Hardware and software - Addressing modes – Assembly language – Stacks &Subroutines

Module II
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 III
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 IV

References:
5. Tanenbaum A S , ”Structured Computer Organisation - 3rd Edition”, Prentice Hall,

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1404 AUTOMATA LANGUAGES AND COMPUTATIONS

Module I
Finite state systems: NFA ,DFA, Definitions. Equivalence of NFA and DFA, NFA to DFA conversion, NFA with epsilon transitions, Elimination of epsilon transitions, Minimization of Finite Automata, Finite automata with output, Applications of Finite Automata. Regular Expressions: Definitions, Equivalence of regular expression and finite automata, Conversion between regular expression and FA, Pumping Lemma and its application, closure properties of Regular sets

Module II

Module III

Module IV
Recursive and recursively enumerable languages, halting problem of TM , Chomsky Hierarchy. Regular grammars: equivalence of regular grammar and FA , converting regular grammar to Finite Automata, Converting Finite Automata to regular grammar, Definition of Linear Bound Automata and Context Sensitive Grammars

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/IT 1405 DATA STRUCTURES AND ALGORITHMS

Module I

Module II

Module III

Module IV
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.

References:
8. ISRD Group, Data structures through C++ Tata McGraw-Hill Education Pvt.ltd

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
Data transmission: Communication model-Data Transmission: Concepts and Terminology- Analog and Digital Data – Analog and Digital Signals-Periodic analog signals-Time and frequency domain-composite signals-Digital signals as composite analog signals-Transmission of digital signals-Transmission impairments -Data rate limits-Noise less channel:-Niquist bit rate-Noisy channel:-Shannon capacity- Performance:-Bandwidth-Throughput-Latency

Module II
Analog Transmission- Digital to Analog conversion: Aspects-ASK-FSK-PSK-QAM- Analog to Analog conversion: AM-FM-PM
Data Compression:- Frequency dependent coding-Huffman coding-LZW Coding

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

Module IV
Multiplexing: Frequency-Division Multiplexing-Synchronous Time-Division Multiplexing-Statistical Time-Division Multiplexing
Spread Spectrum: The Concept of Spread Spectrum-Frequency Hopping Spread Spectrum-Direct Sequence Spread Spectrum-Code-Division Multiple Access
Telephone and cable network: Major components of telephone network- LATAs- Services provided by telephone networks-Dial up modems and standard-Digital subscriber line-ADSL-ADSL Lite-SDSL-VDSL-Cable TV for data transmission: Bandwidth-Sharing-CM and CMTS- Data transmission schemes- DOCSIS

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/EB 14L1 DIGITAL ELECTRONICS LABORATORY

1. Study of standard logic gates and universal gates.
2. Arithmetic circuits
   i. Adders & subtractors using standard logic & universal gates.
   ii. Study of 7483 & binary addition & subtraction using 1’s & 2’s complement.
   iii. BCD adder using 7483.
3. Code converters with mode control, Parity generator/checkers.
4. Study of MUX, DEMUX, decoder & encoder circuits & their ICs.
5. Flip flops: RS, JK, T, D, master-slave JK flip flops using universal gates
6. Counters
   i. Asynchronous UP, DOWN, UP/DOWN counter using JK Flip flops
   ii. Design and realization of sequence generators.
   iii. Study of IC counters 7490, 7492, 7493 and 74193.
7. Study of shift registers and design of Johnson and Ring counter using it.
8. Study of seven segment display & decoder driver (7447)
9. Astable and monostable multi-vibrators using TTL gates
10. Transfer characteristics and specifications of TTL gates

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
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

References:

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
Module I
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 II
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 III
Finite difference Operators: ▼, ∆, 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: 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 IV

References:
1. Irvin Miller & Freiend. Probability And Statistics For Engineers, Prentice Hall of India.

**Type of Questions for University Exam.**

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II
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 III
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 IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/IT 1503 SOFTWARE ENGINEERING

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

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

Module IV
Software Project Management - Brief study of various phases of Project Management – Planning – Organizing – Staffing – Directing and Controlling
Software Project Cost Estimation – CCOMO model – Software Project Scheduling
CASE tools: CASE definitions – CASE Classifications – Analysis and Design Workbenches, Testing Workbenches

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
Raster Scan Graphics: Line Drawing algorithms-Digital Differential Analyser-Bresenham's algorithm:-Integer Bresenham's algorithm,General Bresenham's algorithm,Faster line rasterisation algorithm-Circle generation-Ellipse generation-General function rasterisation-Scan conversions-Displaying line character and polygons-Polygon filling:-Scan converting polygons,Edge fill algorithm,Seed fill algorithms-Antialiasing-Halftoning

Module II
Two dimensional transformations: Representation of points-Transformations and matrices-transformation of points-Transformations of lines-Rotation-Reflection-Scaling-Combined transformations-Homogeneous coordinates
Windowing and clipping: Viewing transformations-Point clipping-Cohen Sutherland line clipping-Lian Brskey 2D Line clipping-Sutherland Hodge man Polygon clipping-Weiner Atherton algorithm-Curve clipping-Text clipping
Plane and Space curves: Curve representation-Nonparametric curves-Parametric curves-Representation of space curves-Spline curves-Geometric and parametric continuity - Cubic Splines-Brazier curves-B-spline curves

Module III
Three Dimensional Transformations and Projections: Three dimensional scaling, shearing,rotation, reflection, translations - Rotation about arbitrary axis Parallel to coordinate axis- Rotation about arbitrary axis in space- Affine and perspective geometry-Otho graphic projections-Taxonomic projections-Oblique projections-Vanishing points-Stereographic projections
Surface Description and Generation: Surface of revolution- Parametric representation of surfaces-Sweep surfaces-Quadratic surfaces-Bazer surfaces-B-spline surfaces
Visible Lines and surfaces: Back Face detection method—Depth buffer method(z-Buffer algorithm)- A-Buffer method-Screen subdivision method-Painter's algorithm-Scan line algorithms

Module IV
Rendering and color models: Illumination model-Determining surface normal and reflection vector- Gouraud shading-Phong Shading-Texture mapping-Ray tracing- Color- Chromacity-Tristimulus theory of color- RGB color system -CMYK color system -HSV color system -HLS color system-Ostwald color System
Modelling techniques and fractals: Surfaces and hierachical modelling- Hierarchical modelling with structures – Fractals
Animation: Devices for producing animation-Computer asisted animation-Video formats-Real-Time animation techniques

References:
   (Transformations and curves in Module 2 and 3)

**Type of Questions for University Exam.**

**Q 1.** Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)

**Q 2. to Q.5 :** Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
CS 1505 DATABASE MANAGEMENT SYSTEMS

Module I

Module II
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 III

Module IV
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

References:
5. C.J Date, “ An Introduction to Database Systems “, Addison-Wesley

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/EB 1506 MICROPROCESSOR BASED SYSTEM DESIGN

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

Module II
8086 hardware design: minimum mode and maximum mode configurations, 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.
Multimicroprocessor Systems:Interconnection topologies-interconnection of 8087 with the CPU- architecture of 8087 - Design of a PC based multimicroprocessor system

Module III
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.

Module IV
Introduction to micro controllers - comparison with microprocessors Study of micro controller (MCS 51 family- 8051) - Architecture, instruction set, addressing modes and programming. Interfacing to ADC and DAC using microcontrollers

References:
10. Intel Users manual for 8086, 80386 & 80486, Pentium & Pentium pro
13. Kenneth Ayala The 8086 Microprocessor: programming and interfacing the PC Thomson Learning
**Type of Questions for University Exam.**

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. \((8 \times 5 = 40 \text{ marks})\)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. \((4 \times 15 = 60 \text{ marks})\)
PART I – Programming of 8085 microprocessor (10 Lab sessions)
1. Study of a typical microprocessor trainer kit and its operation.
2. Simple Programming examples using 8085 instruction set to understand the use of various instructions and addressing modes – at least 20 examples.
3. Implementation of code converters, counters (Up & Down Counters), real time clock.

PART II – Interfacing of peripheral devices (5 Lab sessions)
1. Interfacing and programming of 8255.
2. Interfacing and programming of 8279.
3. Interfacing and programming of 8253.
4. A/D and D/A converter interface.
5. Stepper motor interface

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
CS 15L2 COMPUTER GRAPHICS LABORATORY

Module I
1. Study of graphical input and display devices
2. Study of different display standards

Module II
1. Study of OpenGL libraries and programming techniques
2. Programming using Open-GL libraries in C,C++ or Java
3. Implementing Line, Circle and Ellipse drawing algorithms
4. Implementing Seed filling algorithms
5. Implementing scan line filling method

Module III
1. Implementing 2D and 3D transformations (Use Homogeneous coordinate system
2. Implement line clipping algorithms
3. Implement polygon clipping algorithms for convex and concave polygons
4. Implement text and curve clipping methods

Module IV
1. Programs for generating Space curves
2. Programs for hidden surface elimination
3. Programs for rendering polygon surfaces
4. Simple animation techniques
5. Generating fractal images

References:

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.
CS 1601 DIGITAL SIGNAL PROCESSING

Module I
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 II

Module III
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 IV
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

References:
5. Avatar Singh, Digital Signal Processing Implementations, Edition 1

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS/IT 1602 COMPILER CONSTRUCTION

Module I

Module II

Module III

Module IV

References:
2. Kenneth.C.Louden, Compiler Construction:Principles And Practice, Thomson Learning, India
5. Alan Holub, Compiler Design in C, PHI

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

Case Study: UNIX / LINUX operating system

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1604 COMPUTER NETWORKS

Module I

Module II
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 III
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 IV
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.

References:
5. F. Halsall, Data Communication, Computer Networks and Open Systems, Addison Wesley, 1996
7. Bertsekas and Gallagar , Data Networks, 2/e, PHI, 1992
8. Douglas E Comer ,Computer Networks and Internet’s, 2/e Pearson Education,2004

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
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 II

Module III

Root locus method - basic theory and properties of root loci - procedure for the construction of root loci - Design and compensation of feed back control system – lead,lag and lag-lead compensation - simple design in S-plane.

Module IV
Basic elements of a discrete time control system - sampling - sample and hold - Examples of sampled data systems – pulse transfer function - Review of Z-transforms - system function - mapping between s plane and z plane - analysis of discrete time systems -- examples - stability - Jury's criterion.

Introduction to the state variable concept - state space models - solution of state equations - homogenous case - properties of state transition matrix - state space representation of discrete time systems.

References:
1. Ogata K, Modern Control Engineering, 4th Ed., Prentice-Hall India Ltd./Pearson Education
4. Dorf, Modern Control system, Pearson Education, 8th ed.
5. Franklin, Feedback Control Systems, Pearson Education

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS1606 E1 SOFTWARE TESTING

Module I

Module II
White Box And Black Box Testing: White box testing, static testing, static analysis tools, Structural testing: Unit/Code functional testing, Code coverage testing, Code Complexity testing, Black Box testing, Requirements based testing, Boundary value analysis, Equivalence partitioning, state/graph based testing, Model based testing and model checking, Differences between white box and Black box testing.

Module III
Integration, System, And Acceptance Testing: Top down and Bottom up integration, Bi-directional integration, System integration, Scenario Testing, Defect Bash, Functional versus Non-functional testing, Design/Architecture verification, Deployment testing, Beta testing, Scalability testing, Reliability testing, Stress testing, Acceptance testing: Acceptance criteria, test cases selection and execution.

Module IV
Test Selection & Minimization For Regression Testing: Regression testing, Regression test process, Initial smoke or Sanity test, Selection of regression tests, Execution Trace, Dynamic slicing, Test Minimization, tools for regression testing, Ad hoc Testing: Pair testing, Exploratory testing, Iterative testing, Defect seeding, Test planning, Management, Execution and Reporting, Software Test Automation: Scope of automation, Design & Architecture for automation, Generic requirements for test tool frame work, Test tool selection, Testing in Object Oriented systems.

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III
Verification and validation: Model Building – Verification of Simulation Models – Calibration and Validation of Models – Validation of Model Assumptions – Validating Input – Output Transformations.

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1606 E3 SECURITY IN COMPUTING

Module I

Module II
Encryption Algorithms-Symmetric Key encryption- DES, AES.

Module III
Public Key encryption. RSA Crypto System. Primality testing-
Miller-Rabin Algorithm. Diffie- Hellman Cryptosystem, Hash Algorithms

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II
CPUs: Programming input and output-Supervisor mode,Exceptions and Traps-Coprocessors-Memory system mechanism-CPU performance-CPU power consumption.
Program Design and analysis: Components of embedded program-Model of programs-Assembly ,linking and loading-Basic compilation techniques-Program optimization-Program level performance analysis-Software performance optimization-Program level energy and power analysis-analysis and optimization of program size- program validation and testing

Module III
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. Preemptive real time operating systems-priority based scheduling-Rate monotonic scheduling-Earliest deadline first scheduling-Interprocess communication mechanism-Evaluating OS performance-Power management and optimization of processes.

Module IV
Real Time & Database Applications: - Real-Time Embedded Software Development, Sending a Message over a Serial Link. Distributed embedded architectures-I2C bus-Field bus-Internet enabled systems-Vehicles as networks-Sensor networks.

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 16L1 SYSTEM PROGRAMMING AND HARDWARE LABORATORY

Module I
1. Study of Linux System calls and INT80h
2. Study of NASM/YASM assembler
3. Study of GNU debugger
4. Study of basic hardware components of PC

Module II
1. 32/64 bit assembly language programming using NASM/YASM
2. Unsigned and signed arithmetics
3. Matrix manipulation
4. String manipulation
5. Incorporate C function in assembly programs

Module III
1. File management - create, read, and write operations
2. Process management - create and manage processes
3. Programming to communicate with parallel and serial and LAN interfaces

Module IV
1. Basic Floating point arithmetic
2. Study of INT21h and programming with NASM in Windows Environment

References:

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50% marks in the aggregate and 50% minimum in the end semester examination for a pass.
CS 16L2 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 to 5 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 1701 INDUSTRIAL ORGANIZATION AND MANAGEMENT

Module I
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 II
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-ordinating, communicating, decision making.

Module III
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 industrial 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 IV
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
5. Monks J.G Operations Management .MGH

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1702 ARTIFICIAL INTELLIGENCE

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

Module II

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV
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.

References:
2. Schiller, Mobile Communication, 2/e , Addison Wesley, 2005 (Module III and IV) ISBN:978-0321123817

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1705 E3 GRID COMPUTING

Module I

Module II

Module III

Module IV
Grid Middleware: List of globally available Middlewares – Case Studies -Recent version of Globus Toolkit and GLite – Architecture, Components and Features.

References:

Type of Questions for University Exam
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

References:
7. Simon Haykin: “Neural Networks”, Pearson Education1 998

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 17L1 LANGUAGE PROCESSORS LABORATORY

Students are expected to do the following exercises:

- 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.

References:

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.
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/LINUX
2. Inter process communication. Shared memory, messages, Semaphores and monitors. Implementation of typical problems(E.g. Bounded buffer, Dining Philosophers. etc.)
4. Study of Linux Shell programming .
5. Study of Linux Internals
6. Setting of a LINUX LAN

References:

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.
CS 17L3 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 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 17L4 SEMINAR

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 1801 ADVANCED ARCHITECTURE AND PARALLEL PROCESSING

Module I
Program and Network properties: Condition of parallelism - Program partitioning and scheduling - Program flow mechanism - System interconnect architecture.
Principles of Scalable Performance: Performance matrixes and measures - Parallel processing applications - Speedup performance laws - Scalability analysis and approaches.

Module II
Processors and Memory Hierarchy: Advanced processor technology - Super scalar and vector processors - Memory hierarchy technology - Virtual memory technology.
Bus, Cache and Shared Memory: Bus System - Cache memory organizations - Shared memory organization - Sequential and weak consistency models.

Module III
Pipelining and super scalar techniques: Linear pipeline processors - Non linear pipeline processors - Instruction pipeline design - Arithmetic pipeline design.
Parallel and scalable architectures: Multiprocessor system interconnect - Cache coherence and synchronization mechanism - Three generations of multi computers - Message passing mechanism - Vector processing principles - SIMD computer organization - Principles of multi threading - Fine grain multi computers.

Module IV
Parallel programming: Parallel programming models - Parallel language and compilers - Dependency analysis - Code optimization and scheduling - loop parallelization - MPI and PVM libraries.
Instruction level parallelism: Design issue - Models of typical processor-compiler directed instruction level parallelism - Operand forwarding - Tomusulo's algorithm - Branch prediction - Thread level parallelism.

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
CS 1802 OBJECT ORIENTED MODELLING AND DESIGN

Module I
System Design- Object Design

Module II
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 III

Module IV
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)

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
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 - Case Study - Java RMI.

Module II

Module III

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

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1804 E1 OPERATIONS RESEARCH

Module I
Linear Algebra: Review of the properties of matrices and matrix operations, partitioning of matrices, vectors and Euclidean spaces, unit vectors, sum vectors, linear dependence, bases, spanning set, rank, product form of inverse, simultaneous equations, basic solutions, point sets, lines and hyper planes, convex sets, extreme points, fundamental theorem of linear programming.

Module II
Linear Programming: Fundamentals Theorems of Linear programming, Mathematical formulation of the problem, Assumption of Linear programming, graphical Method.
Simplex Method – Slack & surplus variables, basic feasible solution, reduction of a feasible solution to basic feasible solution, artificial variables, optimality conditions. Charnes ‘M’ Method, two phase method.

Module III
Transportation Problems: Definition of a transportation model, North-west Corner Rule, Least Cost or Matrix Minima Method, Vogel’s approximation method, Degeneracy in Transportation problem.
Assignment Problems
Theorems of Assignment problem, Zero assignments, Unbalanced problems.
Comparison with Transportation Models.

Module IV
Game Theory: Von Neuman’s theorem, saddle points, pure and mixed strategies, formulation of primal and dual LP problems for mixed strategies, dominance, graphical solutions. Queueing Theory : Basic structures of queueing models, exponential and poisson distribution, Kendall’s Notation, Queueing models – M/M/1 and M/M/K.

References:
1. Operations Research, Goel and Mittal, Pragti Prakasan, Meerut
4. Introduction to operational research , C. R. Kothari Vikas Publishing House
5. Resource Management , N.G. Nair

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
CS 1804 E2 DATA MINING

Module I
Introduction to Data Mining: A definition for Data Mining-Applications of data mining-supervised vs. unsupervised learning-data mining strategies-unsupervised clustering using nearest neighbor algorithm-data mining stages-data pre-processing-Introduction to multidimensional data bases-data warehousing-OLAP

Module II
Basic Data Mining techniques: Decision tree building algorithm using information gain concepts-multilayer perceptions for regression and classification-Association rule learning-genetic learning—choosing the best model for a problem-analysis using confusion matrix-cross validation-classification of major clustering methods. Partition algorithms-Hierarchical methods, Density based methods, Grid based methods

Module III
Statistical techniques in data mining: Chi-square analysis-regression techniques-principal component analysis-Naïve Bayes classifier-Support Vector Machines-Lazy classifiers-Rough set concepts-Time series analysis - Case studies in data mining using these classifiers

Module IV
Advanced data mining techniques: Text mining-Web mining-spatial mining-temporal mining-Ensemble techniques-case studies using statistical packages-case studies using WEKA software package

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)
Module I
Mobile Computing Architecture, Mobile computing through telephony, Emerging Technologies, Bluetooth, Radio Frequency Identification (Rfid), Wireless Broadband (WiMAX), Mobile IP, Internet Protocol Version 6 (IPv6), Java Card

Module II
Global System for Mobile Communications (GSM), Short Message Service (SMS), Mobile computing over SMS, Value added services through SMS, Accessing the SMS Bearer, General Packet Radio Service (GPRS), GPRS and packet data network, GPRS network architecture, GPRS Network operations, Applications and limitations, Wireless Application Protocol (WAP), MMS, GPRS applications

Module III

Module IV

References:
2. Amjad Umar, Mobile Computing and Wireless Communications, NGE Solutions, 2004

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
Module I

Module II

Module III

Module IV

References:

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x 5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4 x 15 = 60 marks)
CS 18L1 PROJECT

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.

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.

A committee consisting of the Project Coordinator (appointed by the Head of the Department / Division), project guide and at least one senior faculty member will carry out the assessment based on at least one interim review and a final review just before the submission of the project report.

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:

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regularity and progress of work</td>
<td>60</td>
</tr>
<tr>
<td>Work knowledge and involvement</td>
<td>60</td>
</tr>
<tr>
<td>End semester presentation and oral examination</td>
<td>60</td>
</tr>
<tr>
<td>Level of completion and demonstration of functionality/specifications</td>
<td>60</td>
</tr>
<tr>
<td>Project Report – Presentation style and content</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
</tr>
</tbody>
</table>

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.
CS 18L2 VIVA-VOCE

Each student is required to appear for a viva-voce examination at the end of the complete course work. The students shall produce the seminar report and project reports duly attested by the institutional authorities, before the examiners. The examination panel shall comprise of Head of the Department / Division or his/her nominee and one senior faculty of the Department/Division and an external expert. The examination panel should be appointed by the University. The examiners shall evaluate the students in terms of their conceptual grasp of the course of study and practical/analysis skills in the field.