School of Engineering & Sciences  
B P S Mahila Vishwavidyalaya, Khanpur Kalan (Sonepat)  
(State University Established Under the Legislative Act No 31/2006)  
Course Curriculum & Scheme of Examination  
for  
B.Tech. Information Technology  
THE PROGRAMME  
The Bachelor of Technology in Information Technology is a four year full time programme. The course structure of the programme is given under:-  

Semester – 1  

<table>
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<tr>
<th>S. No</th>
<th>Code</th>
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Total contact Hours =35  

Total Credits=24  

Note: Students will be allowed to use the scientific calculator only, however sharing of calculator not allowed.
School of Engineering & Sciences  
BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat  
(State University Established Under the Legislative Act No. 31/2006)  
B.Tech. Information Technology  

Semester – 2

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Total contact Hours =32                  Total Credits=25  
Note: Students will be allowed to use the scientific calculator only, however sharing of calculator not allowed.
## School of Engineering & Science

**BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat**

(State University Established Under the Legislative Act No. 31/2006)

**B.Tech. Information Technology**

### Semester – 3

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| Lab   |        |                                                 | L  | T  | P  |           | Internal Marks | External Marks |               |
|-------|--------|-------------------------------------------------|----------|--------------|-------|-------------|
| 7     | CSP-211| Data Structure Lab                              | - | -  | 2  | 1         | 25             | 25            | 50           |
| 8     | ECP-223| Digital Electronics Lab                         | - | -  | 2  | 1         | 25             | 25            | 50           |
| 9     | ECP-325| Microprocessor Lab                              | - | -  | 2  | 1         | 25             | 25            | 50           |
| Total |        |                                                 | 18 | 6  | 6  | 24        | 375            | 375           | 750          |

**Total Contact Hours = 30**  **Total Credit = 24**
**School of Engineering & Science**

**BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat**

(State University Established Under the Legislative Act No. 31/2006)

**B.Tech. Information Technology**

**Semester – 4**

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**Total Contact Hours =30**

**Total Credit= 24**

**NOTE:** 4-6 weeks training will be held after fourth semester. However, Viva-Voce will be conducted in the fifth semester
### School of Engineering & Science

**BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat**

(State University Established Under the Legislative Act No. 31/2006)

**B.Tech. Information Technology**

Semester – 5

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Total Contact Hours = 30  
Total Credit = 26

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School of Engineering & Science
BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat

(State University Established Under the Legislative Act No. 31/2006)

B.Tech. Information Technology

Semester – 6

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Total Contact Hours = 32  
Total Credit = 25

NOTE: 4-6 weeks training will be held after fourth semester. However, Viva-Voce will be conducted in the seventh semester
## BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat
(State University Established Under the Legislative Act No. 31/2006)

### B.Tech. Information Technology

#### Semester – 7

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**Total Contact Hours = 28**  
**Total Credit = 26**

**Note:** Project load will be treated as 2 hours for project co-ordinator and 1 hour for each participating teacher. Each batch of (max of 3) students shall design, develop and realize minor project. Student has to submit a project report at the stipulated time. The evaluation system consists of one internal & one external examiner.

### Elective-1
1. CSL-420 Embedded System Design
2. ITL-401 Fault Tolerance System
3. ITL-405 Object Oriented System Design

### Elective-2
1. ITL-407 Natural Language Processing
2. CSL-413 Theory of Computation & Computation Complexity
3. ITL-411 Applied Graph Theory.

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**School of Engineering & Science**
BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonepat
(State University Established Under the Legislative Act No. 31/2006)
B.Tech. Information Technology

Semester – 8

<table>
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<th>S. No</th>
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Total Contact Hours = 32 Total Credit = 27

Note: Project load will be treated as 2 hours for the project co-coordinator and 1 hour for each participating teacher. Attendance is compulsory for each student. Every student have to go for literature survey and present one seminar on literature survey, one on progress and final on complete work. Respective guide have to sit in every presentation.

Elective-1
1. CSL-401 Advanced Computer Architecture
2. CSL-418 Analysis and Design of Algorithm
3. CSL-410 Neural Networks

Elective-2
1 ITL-404. Quality Assurance & Testing
2. CSL-302 Distributed Operating System
3. ECL-310 VLSI Design
Note:
(1) Each subject/course in Computer Information Technology of 3/3.5/4 Credit is of 100 marks having 50 internal and 50 external marks.
(2) Each lab in scheme of Information Technology of 2 Credit is of 50 marks having 25 internal and 25 external marks.
(3) Seminar, General Proficiency and Practical Training 1st and 2nd after 4th and 6th sem is of 50 marks.
(4) Minor and Minor Project each is of 100 Marks.

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All end examinations (Theory & Practical) are of three hours duration
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1 Electric Circuits:
Review of KCL, KVL and DC circuit analysis using nodal and mesh current or loop current method, Signal & wave forms, phasor representation of sinusoidal voltages and currents, power, power factor, analysis of series and parallel circuits, resonance in series and parallel circuits, Balanced three phase system, star and delta connections, relation between line and phase quantities (Voltages and currents) in the two types of connection, analysis of three-phase circuits, power in three-phase circuits, measurement of power by two-watt meter method.

UNIT 2 Magnetic Circuits & Transformers:
Magnetic Circuits: Ampere-turns, magnetomotive force, permeability, reluctance, composite magnetic circuits, comparison between magnetic and electric circuits.

UNIT 3: Dc Machines & Induction Motors:
Dc Machines: Generators and motors, production of voltage and torque, characteristics of dc generators and motors, speed control of dc shunt motors, application of dc generators and motors.
Induction Motors: Principle of working, starting, torque-slip curve and applications of three-phase induction motors. Introduction to single-phase induction motors.

UNIT 4 Electrical Instruments:
Principle of working and constructional features of permanent magnet moving- coil; and moving iron am-meters and voltmeters, electrodynamic wattmeter, induction type single-phase energy meter. Earthing and its importance.

Reference Books:
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
**Infinite Series:** Convergence and divergence, Comparison, D’ Alembert’s ratio, Integral, Raabe’s, Logrithmic and Cauchy root test, Alternating series, Absolute and conditional convergence.
**Applications of Differentiation:** Taylor’s and Maclaurin’s series, Asymptotes, Curvature.

UNIT 2
**Partial Differentiation & its Applications:** Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.
Homogeneous functions, Euler’s theorem, Taylor’s series for functions of two variables (without proof), maxima-minima of function of two variables, Lagrange’s method of undetermined multipliers and differentiation under integral sign.

UNIT 3
**Applications of Single & Multiple Integration:** Applications of single integration to find volume of solids and surface area of solids of revolution. Double integral, change of order of integration, Double Integral in polar coordinates, Application of double integral to find area enclosed by plane curves and volume of solids of revolution.
Triple integral, volume of solids, change of variable, Beta and gamma functions and relationship between them.

UNIT 4
**Vector Calculus:** Differentiation of vectors, scalar and vector point functions gradient of a scalar field and directional derivative, divergence and curl of a vector field and their physical interpretations.
Integration of vectors, line integral, surface integral, volume integral, Green, Stoke’s and Guass theorems (without proof) and their simple applications.

Books Suggested:
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
Environmental pollution: Pollution of water-Domestic sewage and Industrial wastes-Air pollution-Causes and control.

UNIT 2: Corrosion

UNIT 3

UNIT 4
Lubricants: Principles and function of lubricants-Types of Lubrication and Mechanism-Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants-Viscosity, flash and fire point, cloud and pour point, aniline point, Neutralization Number and mechanical strength.
Text Books

NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1 Data Base and Warehouse: An Overview:
Data base feature, Advantages, file structure, file types, logical and relational database, levels of abstraction, data model, Architecture of database management system, Data Ware Housing, Advantages, Possible problems and complexity and ERP system.

UNIT 2 Information Processing & Communication:
Information editing, formatting and presentation by using MS office tools, Basic communication system, analog and digital signal, modulation, Data transmission, Methods of transmission, Modes of transmission, Transmission impairment and Transmission media.

UNIT 3 Internets: an Introduction:
Network, Client & server, Host and terminal, Categories of networks, Network communication Devices, WWW, TCP/IP, FTP, HTTP, URL, ISP, Internet, Dail-Up access, Dedicated connections, IP address, Domain name system, E-Mail, Internet mail protocols, Search engines, digital signature, firewalls, HTML fundamentals, Internal and external linking between web pages, HTML table, list, forms and working with the images.

UNIT 4 Impact of Information Science on Society:
Electronic Commerce, Advantages, Applications, Geographic information system (GIS), Computers in home, administration & management, communication, business & industry, education & training, entertainment, science, medicine & engineering.

Reference Books:
MEL-100  Manufacturing Process

L  T  P  Total Credits: 3.5
3  1  -

NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
Introduction: Introduction to manufacturing processes and their classification, industrial safety, plant layout, types, objectives and advantages.
Casting: Patterns, Materials, Type of allowances; Sand casting; types & properties of moulding sand; various moulding methods; core and its types. Permanent mould castings Casting: Co$_2$ casting, centrifugal casting, die castings; shell molding. Plaster moulding, investment castings, casting defects, remedies.

UNIT 2
Primary Metal Working Processes: Hot and cold forging, hot cold rolling, wire drawing and extrusion processes.
Metal Shearing and Forming: Introduction to shearing, notching, lancing, bending drawing, stretching, embossing and coining operations; Process and their types. Die and punch operations.

UNIT 3
Metal Machining Processes: Lathe-parts and accessories, specifications, turning tools, various operations on lathe (turning, taper turning, thread cutting, drilling, boring).
Plastics Processing: Plastics, their types and manufacturing properties, Compression moulding and Injection moulding.

UNIT 4
Welding and Allied Processes: Classification, gas welding, Resistance welding and its types, thermit welding, Electric arc welding–metal arc welding carbon arc welding, submerged arc welding, TIG, MIG; Welding defects and remedies, Soldering and brazing.

TEXT BOOKS:

REFERENCE BOOKS:
3. Workshop Technology, Vol 1, 2 & 3; Chapman, Waj, Edward Arnold.
UNIT 1 Orthographic Projections:
Theory of orthographic projections, planes of projection, four quadrants, first angle projection, third angle projection, B.I.S. Code of practice. View analysis, orientation of the object, laying out three views drawings, hidden lines and curved surfaces, conventional lines, dimensioning and lettering, conversion of pictorial view into orthographics views development of missing views.

UNIT 2 Projections of Points, Straight Lines and Planes
Point in different quadrants projections of lines-parallel to one both planes, contained by one or both planes, perpendicular to a plain, inclined to one plane and parallel to the other, inclined to both planes, contained by a plane perpendicular to both planes. True length of a line and its inclinations with the reference plane, traces of a line. Types of planes, perpendicular planes, oblique planes, traces of planes. Projections of planes-parallel to one plane, perpendicular to both planes, and perpendicular to one inclined to the other.

UNIT 3 Projections & Sections of Solids:
Projections of Solids: Types of solids-polyhedral, solids of revolution. Projections of solids-axis perpendicular to a plane, axis parallel to planes, axis parallel to one plane and inclined to other, axis inclined to both the planes. Section of Solids: Section planes, sections, true shape of sections, sections of prisms, pyramids, cylinders, cones placed in simple position.

UNIT 4 Graphic Statics:
Basic concepts, Bow’s notation, space-diagram, force and polar diagram, funicular polygon, support & support reactions, compressive and tensile stress, analysis of trusses, stresses in plane framed structures.

Reference Books:
1. Engineering Drawing by P.S. Gill (S.K.Kataria & Sons, Ludhiana)

Note: There will be an internal exam of Engineering Graphics and Drawing.
CSP-100            Information Processing & Internet Lab

L    T    P        Total Credit=1
-    -    2

Exercises involving:
- Sending and receiving mails
- Chatting on the net
- Using FTP
- Using HTML Different Tags (Paragraph, Line break, Marquee, Text formatting etc)
- Design of HTML Forms
- Design of HTML Tables
- Design of HTML Lists
- Using HTML Hyperlink
- Using HTML images
- Making a Web page of your college using HTML tags

Note: At least 5 to 10 more exercises to be given by the teacher concerned.
LIST OF EXPERIMENTS:

1. To verify KCL and KVL
2. To verify Thevenin’s and Norton’s Theorem.
3. To verify Maximum Power Transfer theorems in DC circuits and AC circuits.
4. To verify Reciprocity & Superposition theorems
5. To study frequency response of a series RLC circuit and determine resonant frequency & Q-factor for various values of R, L, C.
6. To study frequency response of a parallel R-L-C Circuit and determine resonant frequency & Q-factor for various values of R, L,C.
7. To perform load test of a transformer and plot load current Vs (a) terminal voltage (b) efficiency.
8. To perform direct load test of a DC shunt generator and plot load voltage Vs load current curve.
9. To plot V-curve of a synchronous motor.
11. To study various type of meters.
13. To measure power in a 3 phase system by two watt meter method.
14. To calibrate single phase energy meter at unity power factor at (1) Full load (2) Half load (3) Quarter load.
15. To measure iron loss in a single phase transformer and to find the equivalent circuit parameters by performing open circuit and short circuit.

NOTE: At least 10 experiments are to be performed by students in the semester. At least 7 experiments should be performed from the below list, remaining three experiments may either be performed from the below list or designed and set by the concerned institution as per the scope of the syllabus of EEL-102.
LIST OF EXPERIMENTS:
1. Volumetric analysis- Permanganometric titrations.
2. Acid-Base titrations,
3. Iodometric titrations,
4. Complexometric titrations and Dichrometric titrations.
5. Determination of alkalinity of irrigation water.
6. Determination of total hardness of water by EDTA titration.
7. Determination of temporary and permanent hardness of water by EDTA titration.
8. Estimation of calcium and magnesium hardness of water separately by EDTA titration.
11. Estimation of calcium as CAO volumetrically in cement.
15. Preparation of Standard EDTA and Estimation of Copper.
17. Determination of acid value of oil.
18. Determination of iodine value of an oil
19. Determination of saponification value of an oil
20. Determination of viscosity of lubricants by redwood viscometers.
23. Manganese in Steel.
24. Iron in Cement

NOTE: At least 12 experiments are to be performed by students in the semester. At least 10 experiments should be performed from the below list, remaining three experiments may either be performed from the below list or designed and set by the concerned institution as per the scope of the syllabus of CHP-102.
UNIT 1 MAT Lab Fundamentals:
Introduction, platforms and versions, launching MATLAB, window, help features, types of file, creating directory and saving files, notation, syntax and operations, constants, variables and expression, some built in function, commands, problems.

UNIT 2 Vectors & Matrics:
Addition, subtraction, multiplication, vector products and transpose, commands, problems.

UNIT 3 MAT Lab Programming:
Input-Output Statements: data input, interactive input, output command. Programming in M files, script and function files, variables, data types, operators, control structures

UNIT 4 Graphics using MATLab:
Creating plots, 2-D, 3-D, multiple plots, editing plots, visualizing function of two variables, image Printing graphics, handle graphics, GUI, problems.

UNIT 5 Introduction to Toolboxes:
The symbolic math toolbox, control system toolbox, signal processing toolbox, communication toolbox, MATLAB applications, animation, problems.

UNIT 6 Simulink Basics:
Introduction, simulink model editor, simulink library, blocksets, running a simulation, building simple model, problems with models.

Reference Books:

1. MATLAB and its Applications in Engineering, Raj Kumar Bansal, Ashok Kumar Goel, Manoj Kumar, Pearson Education.

NOTE: At least 10 experiments are to be performed by students in the semester as per the scope of the syllabus.
Semester-2

ECL-100  Basic Electronics Engineering

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Total Credits: 3.5

NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1 Electronic Components, Signals, Networks:
Passive Components: Resistance, Capacitors and Inductors of various types, Component Specifications, Application, response to dc and sinusoidal/current excitation, star delta connection.
Networks: KCL, KVL, Superposition, Thevenin, Norton, Maximum power transfer theorems for AC and DC circuit, Loop and node analysis of simple networks, selectivity, duals and analog.

UNIT 2 Junction Diode Characteristics:
Review of semiconductor physics, energy band model, n and p-type, Mass action law, Continuity equation, Hall effect, Abrupt and linearly graded junctions, PN junction biasing, Energy band diagram of p-n diode, Volt-ampere characteristics, Temperature dependence of V-I characteristic, Drift & Diffusion current, excess carriers in semiconductors-generation and recombination. Diffusion & Transition capacitances, Switching mode operation of p-n junction, Breakdown Mechanisms in Semi Conductor Diodes.

UNIT 3 Diode Circuits:
Diode as Rectifier, Half wave, Full wave and Bridge, Output Waveforms, Definition & Derivations of $I_{dc}$, $V_{dc}$, $V_{rms}$, $I_{rms}$, efficiency, ripple factor, Peak inverse voltage, Inductor filter, Capacitor filter, L-section filter, pi-section filter, Multiple L-section and Multiple pi section filter, and comparison of various filter circuits in terms of ripple factors; Multipliers; Clipper; Clamper, Peak detector.

UNIT 4 Basic Digital Electronics:
**Reference Books:**
1. Electronic Devices and Circuits, S. Salivahanan, N. Suresh Kumar, A Vallavraj, TMH.
2. Network Analysis, Van Valkenburg, PHI.
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1: Matrices & their Applications:
Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, eigen values and eigen vectors, properties of eigen values, Cayley–Hamilton theorem and its applications.

UNIT 2: Ordinary Differential Equations & their Applications:
Exact differential equations, Equations reducible to exact differential equations, Applications of differential equations of first order & first degree to simple electric circuits, Newton’s law of cooling, heat flow and orthogonal trajectories. Linear differential equations of second and higher order, Complete solution, complementary function and particular integral, method of variation of parameters to find particular integral, Cauchy’s and Legendre’s linear equations, simultaneous linear equations with constant co-efficient; Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

UNIT 3: Laplace Transforms and their Applications:
Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivatives, transforms of integrals, multiplication by n, division by t. Evaluation of integrals by Laplace transforms. Laplace transforms of Unit step function, unit impulse function and periodic function. Inverse transforms, convolution theorem, application to linear differential equations and simultaneous linear differential with constant coefficients.

UNIT 4 Partial Differential Equations and their Applications:
Formation of partial differential equations, Lagrange’s linear partial differential equation, First order non-linear partial differential equation, Charpit’s method. Method of separation of variables and its applications to wave equation and one dimensional heat equation, two dimensional heat flow, steady state solutions only.

Text Books:
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1 Introduction:
Environment & its segments, impact of humans upon environment, Biodiversity and sustainable development, importance.
Field Work: Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain; Visit to a local polluted site-urban/rural/industrial/agricultural; Study of common plants, insects and birds; Study of ecosystems-pond, river, hill slope etc.

UNIT 2 Ecology:
Meaning, scope and subdivision of ecology ecosystems and its types, Energy flow (Radiation& Heat Budget) food chains, trophic level, ecological pyramid biogeochemical cycles-nitrogen, sulphur and phosphorous cycles, Ecological balance in nature, consortium and ranks of consortium, Sources and effects of radio actives fall-outs disposal of radioactive waste, chemical and biological agents and effects of chemical and biological warfare, population Explosion-its affects & India's scenario.

UNIT 3 Energy & Environment:
Energy, uses of energy, historical background, economics of energy, conventional and non-conventional sources of energy, renewable energy sources (such as solar, wind, tidal, wave, geothermal, hydro and bio mass energy), and their environmental impacts with special references on Indian scenario.

UNIT 4 Environmental Pollution & Waste:
Definition, causes, effects and control measures- water pollution, air pollution, land pollution, marine pollution, noise pollution and nuclear hazards.
Solid Wastes: Definition, types and composition, sources of solid wastes, method of disposal, land filling, incineration, pulverization, Composting, Solid waste management.

Recommended Books:
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1 Introduction:
Overview of a computer system, Block diagram and major parts of computer, history of computer development, introduction to binary, octal & hexadecimal numbers, ASCI code, Levels of programming languages–machine language, assembly language, high level language; need of operating system, tree structure of storage, Introduction to algorithms and flow charts, introduction to assembler, compiler and interpreter.

UNIT 2 Basics of C Language:
C character set, Identifiers and keywords, data types, constants, variables and arrays, declarations, expression statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators. Control flow structures, If statement, if….else statement, while statement, do….while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, go to statement.

UNIT 3 Functions and Arrays:
Function declaration, definition & scope, recursion, call by value, call by reference. Storage classes; automatic, external (global), static & registers, Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation, pointer to arrays, array of pointers, pointers to functions, array of pointer to functions, pre-processor directives: #include, #define, macro’s with arguments, the operator # and ##, conditional compilations, multiple file programming.

UNIT 4 Structures and Library Functions:
Structures, unions, structures passing to functions, bit fields, file handling [text(ASCII), binary], standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h.

Text Books:
1. A.S. Tanenbaum: Structured Computer Organization, PHI.

Reference Books:
HUL-100  Communication Skill in English

L  T  P  Total Credits: 3
3  -  -

NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT –I
Oral Communication: Basic concepts, scope and significance, discussion on topic of contemporary relevance, interviews, GD; Body Language: Gestures, postures, facial expression, tone, pitch, rhythm.
Word Study & Writing: Word formation, Illustrative use of words, Paragraph, letter, precise and technical writing.

UNIT –II  Sentence Structure & Grammar: Common Errors, Punctuation, Parts of speech, Subject verb concord, Introduction to tenses, Articles.

UNIT –III  Composition: Re-arranging jumbled sentences to form a coherent paragraph, Officials Letter (representations/complaints etc), Summary.
Vocabulary: One word substitutes, words often confused, list of adjective, list of adverbs, prefixes and suffixes, verbal phrases.

UNIT –IV  Spoken English
1. Essentials of good speaking; dialogues, public speaking and formal presentation.
2. Vowels, Consonants, Phonetics Syllables, Transcription of ‘received pronunciation’ of common English words, including those with ‘-ed’ and ‘-s’ endings, into IPA
3. Primary stress placement on words
4. IPA transcription of weak forms
5. Use of falling, rising and falling-rising tones in ordinary Statements, question, orders and requests.
6. Situational speaking (pair work)
7. Listening for specific purposes.
8. Vocabulary

Reference Books:

(1) English for Engineers and Technologist- Ana Univ, Orient Blackswan
(2) Enrich your English communication skills Book–I by CIEFL, OUP, 2005
(6) Bansal R K and J B Harrison, spoken English for India, orient London.
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
Overview of vibration with emphasis on damped and forced oscillations, resonance, coupled oscillations, normal modes.

Wave Mechanics: Failure of classical physics, qualitative review of relevant experiments, de Broglie waves, uncertainty principle, wave function and Schrodinger equation, probability interpretation, potential barrier and quantum tunneling, potential well, qualitative summary of simple harmonic oscillator and Hydrogen atom

UNIT-2
Dielectric and Magnetic Properties of Materials: Dielectric constant and polarization of dielectric materials, types of polarization (Polarizability), Clausius Mussoti–Equation, frequency dependence of dielectric constant, dielectric losses, dielectric material, Langevin’s theory for dia and paramagnetic material, Phenomena of hysteresis and its applications. Crystal structure of solids, Energy band theory, classification into metals, semiconductor, insulators, Fermi energy and its variation with temperature, Hall effect and its applications, semiconductor statistics, equilibrium properties of semiconductors.

UNIT –3
Superconductivity: Temperature dependence of resistivity in superconducting materials, Meissner effect, Type–I and Type-II superconductors, Temperature dependence of critical field, BCS theory (qualitative), High temperature superconductors, Characteristics of superconductors in superconducting state, London equations, Applications of Superconductors.

Nanomaterials- Basic principle of nanoscience and technology, creation and use of bucky balls, structure, properties and uses of Carbon nanotubes, Applications of nanotechnology.

UNIT – 4
Fiber optics: General ideas of optical fiber, types of fibers, acceptance angle and cone, Numerical aperture, Propagation mechanism and communication in optical fiber, Attenuation, Signal Loss in optical fiber and dispersion.

Lasers: Spontaneous emission, Stimulated emission, Population inversion, CW and pulsed lasers, Helium-Neon, Nd- YAG, Semiconductor lasers, applications of lasers (include holography)

Reference Books:
2. Antenna and wave Propagation, K D Prasad.
4. Quantum Mechanics, Satya Prakash, Pragati Publication.
LIST OF EXPERIMENTS:

1. Identification, Specifications, Testing of passive R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of:
   (a) Multimeters (Analog and Digital)
   (b) Function Generator
   (c) Regulated Power Supplies
6. C.R.O for Measurement of electrical quantities:
   (a) Voltage measurement.
   (b) Frequency measurement
   (c) Phase measurement
   (d) Component Testing
7. Familiarization of PC hardware: function of different part of PC.
8. Study of different type of storage media: CDROM, CDRW, floppy disk, Zip drive, Hard Disks etc.
9. To study V-I characteristic of diode.
10. To study half wave and full wave rectifier.
11. To verify truth table of different logic gates.
12. To study operation of PA systems.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.
LIST OF EXPERIMENTS:
1. Understand the concept of operating system and learn related commands write C programs for following:
2. Addition, subtraction, multiplications, division of 2 numbers.
3. Find max and min of three numbers.
4. Using while loop, find
   \[ S = 1 + 3 + 5 + \ldots \text{ Upto N} \]
   \[ S = x + x^2/2 + x^3/3 \ldots \text{ N terms.} \]
5. Repeat these exercise using do-while loop.
6. Using for loop, calculate
   \[ S = x - x^3/3! + x^5/5! \ldots \text{ N terms.} \]
7. Using loops, print following design
   (a) 1
   (b) *
   12
   123
   \ldots \text{ N lines}
   \ldots \text{ N lines.}
8. Read 2 numbers. Read the choice of operation. Add them if + is pressed. Subtract if – is pressed. Similarly for multiplication (*) and division (/).
9. Repeat exercise 7 such that program gets repeated again and again until user wants to exit.
10. Using function, compute nCm.
11. Using 1-d array read n numbers and find average. Also find the largest of these numbers. Use functions to implement these operations.
12. Implement following operations on matrices
    (a) Addition of two matrices (b) Transpose of a matrix
    (c) Multiplication of two matrices.

NOTE: At least ten experiments have to be performed in the semester; out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution.
1. INTRODUCTION TO CAD: Software AUTOCAD
2. INTRODUCTION TO MODELING: Terminology, the 3 Modes of Display, 3D Models, Turning the 2D sketch into a 3D Model, Viewing your 3D Models. Introduction to modeling tools 2D Drawings: Selection of plane, Sketch Planes & Work Planes the Work Axis, Work Points, lines, curves, and planes, Units, 3D Drawings, Solid and Surface Modeling.
3. INTRODUCTION TO TOOLS: Placement Tools: Place Line, Place Block, Place Shape, Place Circle, And Place Arc. Modification Tools: Un-do, Re-do, Delete Element, Drop Line, Shape Status
4. INTRODUCTION TO DIFFERENT COMMANDS IN CREATING A PART: Revolving Steps, Extrude Steps, Mirror steps, Sweeping Steps and Shell Command.
5. ADDING FEATURES TO PARTS: Adding New Features to Your Part, Editing Model Creating Detailed Drawing "Blueprints" Moving, Section Views, Detail Views, Auxiliary.
6. Creating Assemblies in CAD software.

REFERENCE BOOKS:

1. AutoCAD for Dummies - By Mark Middlebrook-Wiley Publication.
2. AutoCAD tutorials.

NOTE: At least ten experiments have to be performed in the semester from the above mentioned syllabus.
LIST OF EXPERIMENTS:

1. To determine the wavelength of sodium light by Newton’s rings experiment.
2. To find the Specific rotation of sugar solution by using Polarimeter.
3. To find the refractive of a material of a given prism using spectrometer.
4. To find the wavelength of sodium light using Fresnel Biprism.
5. To find the capacity of an unknown capacitor by flashing and quenching potential of argon/neon.
6. To measure the band gap of a semiconductors.
7. To determine the Hall coefficient using Hall Effect.
8. To determine the resistivity of a semiconductor by four probe method.
9. To find the wavelength of various colours of white light with the help of a plane transmission diffracting grating.
10. To convert given galvanometer into an ammeter of given range.
11. To find high resistance by leakage method.
12. To calibrate a voltmeter and an ammeter by using potentiometer.
13. Verification of laws of stretched string- Sonometer.
14. To find the Frequency of A.C. mains-Sonometer.
15. Study of Characteristics of LED and LASER sources.
16. Study of Characteristics of p-i-n and avalanche photo diode detectors.
17. To study the shunting effect of a voltmeter on voltage measurement.
19. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
20. To study characteristic of a thermistor.
21. To study I-V characteristic and rectification properties of a semiconductor.

NOTE: At least 12 experiments are to be performed by students in the semester. At least 10 experiments should be performed from the below list, remaining three experiments may either be performed from the below list or designed and set by the concerned institution as per the scope of the syllabus of PHY-102.
**LIST OF EXPERIMENTS:**
1. Impart communicative skills.
2. Train students to perform in simple day-to-day situations.
3. Overcome common errors in listening/speaking through learning resource centre.
4. Use English language effectively.
5. Help learners to chisel their basic skill of reception/production.

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<tr>
<th>S.No</th>
<th>TOPIC</th>
<th>AIM</th>
<th>PROCEDURE</th>
<th>AIDS (LRC)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Learn to introduce yourself</td>
<td>To offer greeting and enable learners to introduce themselves effectively</td>
<td>Limitation, Pair work, Group work</td>
<td>Listening/speaking activities, use of Visuals.</td>
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<tr>
<td>2.</td>
<td>Learning Pronunciation</td>
<td>To train how to speak correct English sounds</td>
<td>Imitation, Miming, Demonstration</td>
<td>Listening/Speaking Activities</td>
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<td>3.</td>
<td>Basic Communication Patterns</td>
<td>Basic structures: My name is ___ I am ____ My father is ___</td>
<td>Pattern practice, limitation</td>
<td>Handouts, Cassettes, CDs</td>
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<tr>
<td>4.</td>
<td>Listening telephonic conversation</td>
<td>To teach syllabic stress of numbers and alphabets</td>
<td>Miming, Pair work, other activities</td>
<td>Cassettes, CDs</td>
</tr>
<tr>
<td>5.</td>
<td>Listening for information</td>
<td>To train for sentence stress and rhythm</td>
<td>Tasks, activities</td>
<td>Handouts, cassettes, CDs</td>
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<tr>
<td>6.</td>
<td>Learning vocabulary</td>
<td>To teach vocabulary in an interesting way to enhance the word-bank of the learner</td>
<td>Games, Pair work, activities</td>
<td>Handouts, songs, listening/speaking tasks</td>
</tr>
</tbody>
</table>

**NOTE:** Each student have to prepare and maintain a CD record covering all the aspect of lab work
Semester-3

CSL-201  Computer Organization & Architecture

L   T   P  Total Credits=3.5
3   1   -  

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Register Transfer and Micro operation: Register transfer language, register transfer, arithmetic micro operations, logic micro operations, shift micro operations.
Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing & control and instruction cycle.

UNIT – II
Microprogrammed Control Unit: Control memory, address sequencing.
Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes.
Pipeline and vector processing Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, and Array Processors.

UNIT – III
Input-Output Organization: Peripheral devices, interrupts, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, direct memory access, input-output processor and IO programmed.

UNIT – IV
Memory organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, cache mapping, virtual memory, memory management hardware.

Text Books:

References Books:
CSL-203 Discrete Structures

L  T  P  Total Credit=3.5
3  1  -

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

**Unit-1**

**Set Theory:** Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations and lattices
Function and its types, Composition of function and relations, Cardinality and inverse relations

**Unit-2**

**Propositional Calculus:** Basic operations: AND(^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions.

**Recursion and Recurrence Relation:** Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

**Unit-3**

**Algebraic Structures:** Definition and examples of a monoid, Semigroup, group, Homomorphism, Isomorphism and Automorphism, Normal Subgroup, Cyclic subgroup, Integral domain and fields, Cosets, Lagrange’s theorem(With Proof).

**Unit-4**

**Graphs And Trees:** Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eulerian path and circuits, Hamilton paths and circuits, Planar graphs, Euler’s formula, Trees, Spanning trees, Binary trees and its traversals

**Text Books:**
**Reference Books:**

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
**Combinational Circuit Designs:** Fundamentals of Digital Techniques, Sum of products and product of sums, Minterms and Maxterms, Design using gates, Karnaugh map and Quine Mcluskey methods of simplification, MEV method, Problem formulation and design of combinational circuits, Adder/Subtractor, Encoder/decoder, Mux/Demux, Code-converters, BCD arithmetic circuits, Comparators, Drivers for display devices, tristate buffer.

UNIT 2
**Sequential Circuits:** Flip Flops: S-R, J-K, T, D, master_slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Timing signal, Analysis of clocked sequential circuits- their design,

**Fundamental Mode Sequential Circuits:** Design of Synchronous and Asynchronous sequential circuits, State equivalence, minimization, state assignment, Circuit implementation, Registers-Shift registers. Stable, Unstable states, Output specifications, Cycles and Races, Race free Assignments, Hazards.

UNIT 3
**Digital Logic Families:** RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS, BiCMOS logic families, Calculation of noise margin and fan-out, Tristate logic, interfacing of CMOS and TTL families, tristate logic.

UNIT 4
**A/D and D/A Converters:** Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for D/A converters, A/D converters: Quantization, parallel, successive approximation, counting type, dual-slope ADC, specifications of ADCs.

**Programmable Logic Devices and Semiconductor Memories:** ROM, PLA, PAL, FPGA and CPLDs, RAM, Memory decoding, Semiconductor memories.

**TEXT BOOK:**

**REFERENCE BOOKS:**
1. Digital Integrated Electronics: Taub & Schilling; MGH.
2. Digital Principles and Applications: Malvino & Leach; McGraw Hill.
UNIT 1.
Introduction:
The essentials of a Communication system, modes and media’s, Classification of signals and systems, Electromagnetic Spectra, base band and pass band signals, Modulation process-need, band width requirements-frequency spectra of non-sinusoidal signals, Analogue vs Digital communication, Continuous and discrete spectra - band pass system, Fourier analysis of signals.

UNIT 2.
Amplitude Modulation:
Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, Generation of DSBSC waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector, Coherent detection of DSBSC waves, single side band modulation, generation of SSB waves, demodulation of SSB waves, vestigial sideband modulation (VSB).

Angles Modulation:

UNIT 3.
Transmitters:
Radio Transmitter-Classification of Transmitter, AM Transmitter, Effect of feedback on performance of AM Transmitter, FM Transmitter–Variable reactance type and phase modulated FM Transmitter, frequency stability in FM Transmitter.

Receivers:
Types- TRF receiver, Superhetrodyne Receiver, RF section and Characteristics- Frequency changing and tracking, IF, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.
UNIT 4. 
Pulse Analog Modulation:
Sampling theory, time division (TDM) and frequency division (FDM) multiplexing, pulse amplitude modulation (PAM), pulse time modulation. PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM.

Introduction to Noise:

Text Books:
2. Communication systems: Singh & Sapre; TMH.

Reference Books:
1. Electronic Communication systems: Kennedy; TMH.
2. Communication Electronics: Frenzel; TMH.
3. Communication system: Taub & Schilling; TMH.
Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
The 8085 Processor:
Introduction to microprocessor, 8085 microprocessor: Architecture, instruction set, interrupt structure, and assembly language programming.

The 8086 Microprocessor Architecture:
Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; Special functions of General purpose registers. 8086 flag register and function of 8086 Flags, memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

UNIT 2
Instruction Set of 8086:
Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

UNIT 3
Interfacing Device:
The 8255 PPI chip: Architecture, control words, modes and examples, Interfacing Keyboard, Displays, Stepper Motor and actuators, D/A and A/D converter interfacing.

DMA : 
Introduction to DMA process, Need for DMA, 8237 DMA controller, DMA data transfer Method, Interfacing with 8257.

UNIT 4
Interrupt and Timer:
8259 Programmable interrupt controller, Programmable interval timer chips.

Serial Data Transfer Schemes
Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion.
Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

Text Books:
1. Microprocessor Architecture, Programming & Applications with 8085: Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor: Brey; PHI
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Fundamentals of algorithm analysis: Big ‘O’ notations, Time and space complexity of algorithms, Elementary data structures and their applications
Arrays: ordered lists, representation of arrays, sparse matrices, linked lists: singly and doubly linked lists, stacks, queues, multiples stacks and queues, Applications: polynomial arithmetic, infix, postfix and prefix arithmetic expression conversion and evaluations.

UNIT – II
Trees: Binary trees: Definition, traversal, threaded binary tree, Counting Binary Tree.
Graphs: Representation, traversal, connected components, shortest path and transitive closure, topological sort, activity network, critical path, path enumeration. Dijkstra’s Algorithm, Floyd Warshall’s Algorithm, Minimum Spanning Tree Definitions.

UNIT – III
Searching & Sorting: Binary Search Tree, Insertion & Deletion, AVL Trees, Hash function, Hash table, Internal sort: Radixsort, Insertion sort, Exchange sort, Selection sort, Quicksort, Shellsort, Mergesort, Heaport, External sort: K-way mergesort, balanced mergesort, polyphase mergesort

UNIT – IV
Files: Files, Queries and sequential organization; Cylinder surface indexing, Hashed Indexed, Tree Indexing, B-Trees, Trie Indexing, Sequential file organizational, random file organization, Hashed file organization, Inverted files, cellular partitions.

Text Books:
References Books:

CSP-221                      Data Structures & Algorithms Lab

L T P              Total Credit=1
- - 2

LIST OF EXPERIMENTS

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only
   a) Addition   b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort
5. Write a program to implement various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using ‘call by value’ and ‘call by reference strategies.
7. Write a program to implement binary search tree and also Insertion and Deletion in Binary search Tree
8. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the linked list.
9. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
10. Create a linked list and perform the following operations on it
     a) add a node         b) Delete a node
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate various graph traversal algorithms.
13. Write a program that simulates various tree traversal algorithms.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.
LIST OF EXPERIMENTS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. Design of half adder and full adder using NAND gates.
4. To verify the operation of multiplexer & Demultiplexer.
5. To verify the operation of comparator.
6. To verify the truth tables of S-R, J-K, T & D type flip-flops.
7. Set up R-S & JK flip flops using NAND Gates.
8. To verify the operation of bi-directional shift register.
9. To design & verify the operation of 3-bit synchronous counter.
10. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
11. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
13. To design & realize a sequence generator for a given sequence using J-K flip-flops.
14. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
15. Design a 4-bit shift-register and verify its operation. Verify the operation of a ring counter and a Johnson counter.
17. Study of MUX & DeMUX Circuits and ICs

NOTE: At least ten experiments are to be performed; atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.
LIST OF EXPERIMENTS

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for:
   a. Addition of two 8-bit numbers.
   b. Addition of two 8-bit numbers (with carry).
3. Write a program using 8085 and verify for:
   a. 8-bit subtraction (display borrow)
   b. 16-bit subtraction (display borrow)
4. Write a program using 8085 for multiplication of two 8-bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8-bit numbers by bit rotation method and verify.
6. Write a program using 8085 for division of two 8-bit numbers by repeated subtraction method and test for typical data.
7. Write a program using 8085 for dividing two 8-bit numbers by bit rotation method and test for typical data.
8. Study of 8086 microprocessor kit.
9. Introduction to MASM/TASM
10. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double word division and verify.
11. Write a program using 8086 for finding the square root of a given number and verify.
12. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.
13. Write a program using 8086 and verify for:
   a. Finding the largest number from an array.
   b. Finding the smallest number from an array.
14. Write a program using 8086 for arranging an array of numbers in descending order and verify.
15. Write a program using 8086 for arranging an array of numbers in ascending order and verify.
16. Write a program for finding square of a number using look-up table and verify.
17. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.
18. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.
19. 8259 – Interrupt Controller: Generate an interrupt using 8259 timer.
20. 8279 – Keyboard Display: Write a small program to display a string of characters.
21. 8255 – PPI: Write ALP to generate sinusoidal wave using PPI. 8251 – USART:

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

Semester-4

CSL-202 Principles of Operating Systems

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<td>3</td>
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</table>

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation, Segmentation with Paging
Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations, Demand Segmentation

UNIT – II
CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation
Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Synchronization in Solaris 2, Atomic Transactions

UNIT – III
Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Device Characteristics-Hardware Consideration, Input or Output Devices, Storage Devices, Channels and Control Units, Independent Device Operation, Buffering, Multiple Paths, Block Multiplexing, Device Allocation Consideration,
Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability, Stable-Storage Implementation

UNIT – IV

Text Books:

References Books:
Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Introduction: Introducing Object-Oriented Approach related to other paradigms (functional, data decomposition), Characteristics of Object-Oriented Languages.

UNIT – II
Classes and Objects: Abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, Copy Constructor, Static Class Data, Constant and Classes, C++ garbage collection, dynamic memory allocation.

UNIT – III
Inheritance and Polymorphism: Inheritance, Types of Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Type of Polymorphism – Compile time and runtime, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism, Generic function – template function, function name overloading, Overriding inheritance methods.

UNIT – IV
Files and Exception Handling: Persistant objects, Streams and files, Namespaces, Exception handling, Generic Classes

TEXT BOOKS:
REFERENCE BOOKS:

CSL-206 Computer Hardware Technologies

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Total Credit=3.5

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

Memory
Memory, memory chips & modules, memory types, advanced memory technologies, troubleshooting memory.

Unit-2

Motherboard
PC family tree, motherboard controllers and system resources, input-output ports, IRQ, I/O bus system: ISA, MCA, EISA, VESA local bus, PCI, AGP, PCIX; on board I/O devices, ROMBIOS, ROM POST, CMOS setup.

Power Supply
Power supply function and operation, power supply quality and specification, power protection and back-up, backup power system; UPS; troubleshooting power supply.

Unit-3

Interfaces and I/O Ports
Floppy disk interface, IDE interface: ATA standards, master-slave configuration, data transfer mode; SCSI interface: SCSI bus, SCSI standards; which is better SCSI or IDE; serial ports, parallel ports, USB, Video adapters, troubleshooting Video adapters.

Unit -4

Device drives and peripherals
Floppy disk drive, hard disk drive, CD ROM drive, DVD ROM drive, record able drives, keyboards, mice, printers and monitor, trouble shooting drives and peripherals.

BOOKS
1. Craig Zacker & John Rourtre: PC Hardware- The complete reference, TMH.

CSL-208 Data Base Management Systems

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</table>

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I

UNIT – II
Relational Model, Languages & Systems: Relational Data Model & Relational Algebra, Relational Model Concepts, Relational Model Constraints, Relational Algebra, SQL – A Relational Database Language, Data Definition in SQL, View and Queries in SQL, Specifying Constraints and Indexes in SQL, Practicing SQL commands using ORACLE.

UNIT – III
Relational Data Base Design and Oracle Architecture: Functional Dependencies & Normalization for Relational Databases, Functional Dependencies, Normal Forms Based on Primary Keys, (1NF, 2NF, 3NF & BCNF), Lossless Join and Dependency Preserving Decomposition, Oracle 8 Architecture, Database Storage, Oracle Software Structures, Shared Database Access Mechanism, Database Protection.

UNIT – IV

**Text Books:**

**References Books:**
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Course Objective: The purpose of this course is to: Acquaint the student in the basic economic concepts and their operational significance and stimulate her to think systematically and objectively about contemporary economic problems.

Unit-I
Definition of Economics-various definitions, circular flow of economic activity, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance, the concept of equilibrium

Unit-II
Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand, the indifference curve theory, consumers surplus

Unit-III
Objective of business firm, Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale. Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

Unit-IV
Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligopoly, Monoplistic Competition (Main features of these markets)
Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices.


Text Books:

Reference Books:
1. A Text Book of Economic Theory Stonier and Hague (Longman’s Landon)
6. Indian Economy: Rudar Dutt & K.P.M. Sundhram
7. Indian Economy-Mishra &Puri
CSL-210  Automata Theory

L   T   P  Total Credit=3.5  
3   1   -  

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

**Finite Automata and Regular Expressions:** Finite State Systems, Basic Definitions Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Finite automata with e-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

Unit-2

**Introduction to Machines:** Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, Conversion of NFA to DFA by Arden’s Method.

**Properties of Regular Sets:** The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Unit-3

**Grammars:** Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

**Pushdown Automata:** Introduction to Pushdown Machines, Application of Pushdown Machines

Unit-4

**Turing Machines:** Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem.

**Chomsky Hierarchies:** Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

**Computability:** Basic concepts, Primitive Recursive Functions.

**Text Books:**
1. Introduction to automata theory, language & computations- Hopcroft & O.D.Ullman, R Mothwani, 2001, AW

**Reference Books:**
2. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
5. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.
CSP-220 Operating System Lab

L T P Total Credit=1
- - 2

LIST OF EXPERIMENTS

1. Study of WINDOWS 2000 Operating System
2. Administration of WINDOWS 2000 (including DNS, LDAP, Directory Services)
3. Study of LINUX Operating System (Linux, Kernel, Shell, Basic Commands, Pipe & Filter commands)
4. Administration of LINUX Operating System
5. Writing of Shell Scripts (Shell programming)
6. AWK programming

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

CSP-222 C++ Programming Lab

L T P Total Credit=1
LIST OF EXPERIMENTS

1. Raising a number \( n \) to a power \( p \) is the same as multiplying \( n \) by itself \( p \) times. Write a function called `power()` that takes a double value for \( n \) and an int value for \( p \), and returns the result as double value. Use a default argument of 2 for \( p \), so that if this argument is omitted, the number will be squared. Write a `main()` function that gets values from the user to test this function.

2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, \((4,5)\) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates.

Write a program that uses a structure called point to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:

Enter coordinates for P1: 3 4
Enter coordinates for P2: 5 7
Coordinates of P1 + P2 are: 8 11

3. Create the equivalent of a four-function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result.

When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be ‘Y’ or ‘N’. Some sample interaction with the program might look like this:

Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, second number 12 + 100
Answer = 112
Do another (Y/ N)? N
4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:
Enter your area code, exchange, and number: 415 555 1212
My number is (212) 767-8900
Your number is (415) 555-1212

5. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on the object on display.

6. Create a class rational which represents a numerical value by two double values: NUMERATOR & DENOMINATOR. Include the following public member Functions:
constructor with no arguments (default).
constructor with two arguments.
void reduce( ) that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
Overload + operator to add two rational number.
Overload >> operator to enable input through cin.
Overload << operator to enable output through cout.
Write a main ( ) to test all the functions in the class.

7. Consider the following class definition
class father {
    protected : int age;
    public;
    father (int x) {age = x;}
    virtual void iam ( )
        { cout << "I AM THE FATHER, my age is : " << age<< end1:}
};
Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar but appropriate messages. You should also define suitable constructors for these classes. Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them.
Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.

8. Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.
9. A hospital wants to create a database regarding its indoor patients. The information to store include:
   Name of the patient
   Date of admission
   Disease
   Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class
to store the above information. The member function should include functions to enter
information and display a list of all the patients in the database. Create a derived class to
store the age of the patients. List the information about all the to store the age of the
patients. List the information about all the pediatric patients (less than twelve years in age).

10. Make a class Employee with a name and salary. Make a class Manager inherit from
    Employee. Add an instance variable, named department, of type string. Supply a method to
toString that prints the manager’s name, department and salary. Make a class Executive
    inherit from Manager. Supply a method to String that prints the string “Executive” followed
    by the information stored in the Manager superclass object. Supply a test program that tests
    these classes and methods.

11. Imagine a tollbooth with a class called toll Booth. The two data items are a type
    unsigned int to hold the total number of cars, and a type double to hold the total amount of
    money collected. A constructor initializes both these to 0. A member function called
    payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function,
called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, a
    member function called displays the two totals.

Include a program to test this class. This program should allow the user to push one key to
count a paying car, and another to count a nonpaying car. Pushing the ESC kay should cause
the program to print out the total cars and total cash and then exit.

12. Write a function called reversit ( ) that reverses a string (an array of char). Use a for
    loop that swaps the first and last characters, then the second and next to last characters and so
    on. The string should be passed to reversit ( ) as an argument.

Write a program to exercise reversit ( ). The program should get a string from the user, call
reversit ( ), and print out the result. Use an input method that allows embedded blanks. Test
the program with Napoleon’s famous phrase, “Able was I ere I saw Elba)”.

13. Create some objects of the string class, and put them in a Deque-some at the head of
    the Deque and some at the tail. Display the contents of the Deque using the forEach ( )
    function and a user written display function. Then search the Deque for a particular string,
    using the first That ( ) function and display any strings that match. Finally remove all the
    items from the Deque using the getLeft ( ) function and display each item. Notice the order
    in which the items are displayed: Using getLeft ( ), those inserted on the left (head) of the
    Deque are removed in “last in first out” order while those put on the right side are removed in
    “first in first out” order. The opposite would be true if getRight ( ) were used.
14. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function `get data()` to initialize base class data members and another member function `display area()` to compute and display the area of figures. Make `display area()` as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle = \(x \times y\)
Area of triangle = \(\frac{1}{2} \times x \times y\)
LIST OF EXPERIMENTS

I. Create a database and write the programs to carry out the following operation:

Add a record in the database
Delete a record in the database
Modify the record in the database
Generate queries
Generate the report
List all the records of database in ascending order.

II. Develop a menu driven project for management of database system:

1. Library information system
   (a) Engineering
   (b) MCA

2. Inventory control system
   (c) Computer Lab
   (d) College Store

3. Student information system
   (e) Academic
   (f) Finance

4. Time table development system
   (g) CSE, IT & MCA Departments
   (h) Electrical & Mechanical Departments

Usage of S/w:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. VB, MS SQL SERVER 2000

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

CSP-223 Computer Hardware Lab

L       T       P  Total Credit=1

To prepare your Bio Data using MS Word
To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min and max marks in each subject.

Prepare a presentation explaining the facilities/infrastructure available in your college/institute.
Create a database of books in the library on a mini scale w.r.t. Computers and manipulate the database using different forms and reports.

**PC Hardware:**
To check and measure various supply voltages of PC.
To make comparative study of motherboards.
To observe and study various cables, connections and parts used in computer communication.
To study various cards used in a system viz. display card, LAN card etc.
To remove, study and replace floppy disk drive.
To remove, study and replace hard disk.
To remove, study and replace CD ROM drive.
To study monitor, its circuitry and various parts present and some elementary fault detection.
To study printer assembly and elementary fault detection of DMP and laser printers.
To observe various cables and connectors used in networking.
To study parts of keyboard and mouse.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

**Reference Books:**

2. PC Hardware: The complete reference, Craig Zacker & John Rouske, TMH
3. Upgrading and Repairing PCs, Scott Mueller, 1999, PHI,
Semester-5

CSL-301                                               Principles of Software Engineering

L  T  P                                           Total Credit=3.5
3  1  -

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Introduction: Definition of software and software Engineering, Software Crisis, Software Processes & Characteristics, Software life cycle models: Waterfall, Prototype, Evolutionary and Spiral Models
Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

UNIT – II
Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design

UNIT - III

UNIT - IV
Text Books:

Reference Books:
CSL-303  Computer Networks

Duration of Exam: 3 Hrs.

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit – I

Uses of Computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IP-Overview, IP Address Classes, Subnetting), Domain Name Registration & Registrars

The Physical Layer: Theoretical basis for data communication, transmission media-Magnetic Media, Twisted Pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission, narrowband ISDN, broadband ISDN and ATM.

Unit – II

The Data Link Layer: Data link layer design issues, error detection and correction, data link protocols, sliding window protocols, Examples of Data Link Protocols.

The Medium Access Sublayer: The channel allocation problem, multiple access protocols, IEEE standard 802 for LANS and MANS, high-speed LANs, satellite networks, Network devices-repeaters, hubs, switches and bridges.

Unit – III

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithm, internetworking, the network layer in the internet, the network layer in ATM networks. IP version 4 and 6, SONET/SDH, FDDI and transport Layer.

Unit – IV

The session layer, presentation and application layers, ISO protocols

Text Books:

Reference Books:

UNIT 1
Principles of Digital Data Transmission

Base Band Data Transmission

UNIT 2
Digital Multiplexing

Information Theory:
Discrete messages, concept of amount of information, entropy, information rate. Source coding- Kreft inequality Shannon - Fano and Huffman coding. Shannon’s theorem, Channel capacity, Types of channels, Symmetric channels, Binary Symmetric Channel. capacity of Gaussian channel- Trade off between band width and signal to noise ratio, Capacity of a channel with infinite band width, Optimum modulation system, Use of orthogonal signal to attain Shannon ‘s limit. Efficiency of orthogonal signal transmission.

UNIT 3
Codes for Error Detection and Correction
Parity check coding, Linear block codes, Error detecting and correcting capabilities, Generator and Parity check matrices, Syndrome decoding, Hamming codes, Encoding and decoding of systematic and unsystematic codes. Cyclic codes:- Generator polynomial, Generator and Parity check matrices, Encoding of cyclic codes, Syndrome computation and error detection, Decoding of cyclic codes. Convolutional codes:- Encoding, decoding of convolutional codes: State, Tree and Trellis diagrams, Maximum likelihood -Viterby algorithm, Sequential decoding Burst error correction -Interleaving techniques - Block and convolutional interleaving, Coding and interleaving applied to CD recording - ARQ:- Types of ARQ, Performance of ARQ, Comparison of coded & uncoded system.
Unit 4
Random Signal Theory:
Representation of random signals, concept of probability, probability of joint occurrence, conditional probability, discrete probability theory, continuous random variables, probability distribution function, probability density function, joint probability density functions. Statistical average and moments, Ergodic processes, correlation function, power spectral density, central limit theory, response of linear system to random signals. Error function, regularity, covariance relation among the spectral densities of the two input-output random processes. Cross spectral densities, optimum filters.

Text Book:
1. Principles of Communication Systems: Taub Schiling; TMH
2. Digital and analog communication system by simon haykin(willey)
4. Digital Communications Fundamentals and Applications: Bernard Sklar, Sklar Person Education

Reference Books:
1. Communication Systems: Singh and Sapre ; TMH
2. Communication Systems: A Bruce Carlson; TMH
3. Digital and Analog communication system by B.P.Lathi(LCBS)
5. Wayne Tomasi: Morden Electronic communication Systems. Person Education /PHI
6. Digital Communication Techniques Simon ,Hindey Lindsey PHI
12. Introduction to statistical Signal Processing With Applications M D Srinath,P K.Rajasekaran, RE. Viswnathan PHI
13. Analog and Digital Communication M S Roden PHI
14. Digital modulation and coding. Wilson, Pearson Education
15. Applied coding and information Theory for engineers, Wells,
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

System models and role of simulation. Entities, Attributes, States and Activities. Types of systems - Deterministic, Stochastic, Continuous and Discrete systems. Steps in simulation studies.

Unit-2

Statistical tools and techniques- generation of pseudorandom numbers, random variate generation for uniform, Poisson and normal distributions, sampling and estimation, maximum likelihood estimation, confidence intervals and hypothesis testing, stochastic processes and Markov models.

Unit-3


Unit-4


References:

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

**Introduction**: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters, Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations, type checking & type conversions, Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

Unit-2

**Structured data objects**: Structured data objects & data types, specification & implementation of structured data types, Declaration & type checking of data structure, vector & arrays, records Character strings, variable size data structures, Union, pointer & programmer defined data objects, sets, files.

**Subprograms and Programmer Defined Data Types**: Evolution of data type concept, abstraction, encapsulation & information hiding, Subprograms, type definitions, abstract data types.

Unit-3

**Sequence Control**: Implicit & explicit sequence control, sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return, recursive subprograms, Exception & exception handlers, co routines, sequence control.

**Data Control**: Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope. Parameter & parameter transmission schemes.

Unit-4

**Storage Management**: Major run time elements requiring storage, programmer and system controlled storage management & phases, Static storage management, Stack based storage management, Heap storage management, variable & fixed size elements.

**Programming Languages**: Introduction to procedural, non-procedural, structured, functional and object oriented programming language, Comparison of C & C++ programming languages.
Text Book:
   Pub.
2. Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan,
   2002, TMH,

Reference Books:
1. Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications
   (Springer Verlag),
3. Programming Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002,
   T.M.H.
UNIT – 1

UNIT – 2
Planning Types and Process, Management by Objectives, Decision-Making Models, Organizational context of decisions, Problem solving techniques and processes, Controlling: Process and Techniques

UNIT – 3
Organizational Climate, Culture and Managerial ethos, Organisational structure & Design, Managerial Communication.

UNIT – 4

Text Books:

References Books:
LIST OF EXPERIMENTS:
1. Pulse Amplitude Modulation and demodulation.
2. Pulse Width Modulation and demodulation.
4. Sampling Theorem—verification.
5. Time division multiplexing.
6. Pulse code modulation.
7. Differential pulse code modulation.
8. Delta modulation.
10. Phase shift keying.

NOTE: At least ten experiments are to be performed. Seven experiments should be performed from the above list and the remaining three experiments can be either from the above list or set by the concerned institution as per the scope of the syllabus of EE-305-C.
At least five experiments are to be performed set by the concerned institution as per the scope of the syllabus and availability of simulation tools and various simulators.
IPT-325  Practical Training

L  T  P  Total Credits=2
-  -  -

Duration of Exam: 3 Hrs.

Practical training conducted after fourth semester will be evaluated in the fifth Semester based on Viva-Voce.
IPT-325          Practical Training

L    T    P        Total Credits=2
-    -    -

Duration of Exam: 3 Hrs.

Practical training conducted after fourth semester will be evaluated in the fifth Semester based on Viva-Voce.
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling.
Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

UNIT – II
Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.
Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML).

UNIT – III
Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.
Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

UNIT – IV
Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.
Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

Text Books:
Reference Books:
CSL-305               Security of Information System

L     T     P            Total Credit=3.5
3     1     -

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

Basic Encryption and Decryption
Terminology and Background: Encryption, Decryption and Cryptosystems, Plain Text and Cipher Text, Encryption Algorithms, Cryptanalysis.
Introduction to Ciphers: Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic Ciphers, Polyalphabetic Ciphers such as Vigenere Tableaux, Cryptanalysis of Polyalphabetic Ciphers, Perfect Substitution Cipher such as the Vernam Cipher, Stream and Block Ciphers, Characteristics of ‘Good’ Ciphers: Shannon Characteristics, Confusion and Diffusion, Information Theoretic Tests, Unicity Distance.

Unit-2


Hash Algorithms: Hash Concept and Description of Hash Algorithms.
Secure Secret Key (Symmetric) Systems: The Data Encryption Standard (DES), Analyzing and Strengthening of DES, Key Escrow and Clipper, Introduction to Advance Encryption Standard (AES)

Unit–3

Applied Cryptography, Protocols and Practice
Key Management Protocols: Solving Key Distribution Problem, Diffie-Hellman Algorithm, Key Exchange with Public Key Cryptography.
Unit-4
Network Security
Network Security Issues such as Impersonation, Message Confidentiality, Message Integrity, Code Integrity, Denial of Service, Secure Communication Mechanisms such as IPSec, PKI based Authentication and Kerberos Authentication, Biometrics Authentication Mechanisms, Access Control Mechanisms, Firewalls

Reading List

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
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</thead>
<tbody>
<tr>
<td>1. Security in Computing</td>
<td>Charls P Pfleeger</td>
</tr>
<tr>
<td>2. Applied Cryptography Protocols,</td>
<td>Bruce Schneier</td>
</tr>
<tr>
<td>3. Algorithms and Source Code in C</td>
<td>Rolf Oppliger</td>
</tr>
<tr>
<td>5. Digital Certificates Applied Internet</td>
<td>Jalal Feghhi, Peter Williams</td>
</tr>
<tr>
<td>6. The World Wide Web Security FAQ</td>
<td>Lincoln D Stein</td>
</tr>
<tr>
<td>7. Cryptographic message syntax standards</td>
<td>RSA Laboratories</td>
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CSL-308 Multimedia Technologies

L T P Total Credits=3.5
3 1 -

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT -1: Introduction to Multimedia System: Architecture and components, Multimedia distributed processing model, Synchronization, Orchestration and Quality of Service (QOS) architecture. Audio and Speech: Data acquisition, Sampling and Quantization, Human Speech production mechanism, Digital model of speech production, Analysis and synthesis, Psycho-acoustics, low bit rate speech compression, MPEG audio compression.


UNIT -4: Multimedia Information Systems: Operating system support for continuous media applications: limitations is usual OS, New OS support, Media stream protocol, file system support for continuous media, data models for multimedia and hypermedia information, content based retrieval of unstructured data.
Text Books:

References Books:
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-I.


Unit-2

**More Controls:**
Text Boxes, Group Boxes, Check Boxes, Radio Buttons, Picture Boxes, Setting a Border and Style, Drawing a Line
Working with Multiple Controls: Selecting Multiple Controls, Deselecting a Group of Controls, Moving Controls as a Group, Setting Properties for Multiple Controls, Aligning Controls, Designing the User Interface, Defining Keyboard Access Keys, Setting the Default and Cancel Properties of Buttons, Setting the Tab Order for Controls, Setting the From’s Location on the Screen, Creating Tooltips

**Variables, Constants and Calculations:**
Data: Variables and Constants, Data Types, Naming Rules, Naming Conventions, Constant: Named and Intrinsic, Declaring Variables, Scope and Lifetime of Variables, Handling Exceptions, Try/Catch Blocks,
Displaying Messages in Message Boxes: The TextMessage String, The Title Bar Text, MessageBox Buttons, MessageBox Icons, Using Overloaded Methods

**Unit-3**

**Decisions and Conditions:**
If Statements, LISTS, LOOPS: List Boxes and Combo Boxes, The Items Collection, Filling a List, The SelectedIndex Property, The Items Count Property, Referencing the Items Collection, Removing an Item from a List, Clearing a List, List Box and Combo Box Events, Do/Loops, For/Next Loops

**Unit-4.**

**Menus, Sub Procedures, and Functions:** Menus, Creating Context Menus, Writing General Procedures, GRAPHICS, ANIMATION, Toolbars and Status Bars, Image Lists, Toolbars, Status Bars, The Calendar Controls
This course will cover basic ideas and techniques underlying the design of intelligent computer systems. Topics include:

**Unit-1**

Introduction to AI, intelligent agents and Natural Language Processing.

**Unit-2**

Problem Solving: Solving Problems by Searching, heuristic search techniques, constraint satisfaction problems, stochastic search methods.

Game Playing: minimax, alpha-beta pruning.

**Unit-3**

Knowledge and Reasoning: Building a Knowledge Base: Propositional logic, first order logic, situation calculus. Theorem Proving in First Order Logic.

Planning, partial order planning.

Uncertain Knowledge and Reasoning, Probabilities, Bayesian Networks.

**Unit-4**

Learning: Overview of different forms of learning, Learning Decision Trees, Neural Networks

**Text Book:**

**Unit-1**  
**Introduction**: Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

**Unit-2**  
**VHDL Statements**: Assignment statements, sequential statements and process, conditional statements, case statement, Array and loops, resolution functions, Packages and Libraries, concurrent statements.

**Subprograms**: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

**Unit-3**  
**Combinational Circuit Design**: VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

**Sequential Circuits Design**: VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

**Unit-4**  
**Design of Microcomputer**: Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

**Design with CPLDs and FPGAs**: Programmable logic devices: ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

**Text Book**:  
- "VHDL-Analysis & Modelling of Digital Systems”: Navabi Z; McGraw Hill.

**Reference Books**:  
- [Insert references here]
LIST OF EXPERIMENTS

1. Design all gates using VHDL.
2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. half adder
   b. full adder
3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. multiplexer
   b. demultiplexer
4. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. decoder
   b. encoder
5. Write a VHDL program for a comparator and check the wave forms and the hardware generated
6. Write a VHDL program for a code converter and check the wave forms and the hardware generated
7. Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated
8. Write a VHDL program for a counter and check the wave forms and the hardware generated
9. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
    a. register
    b. shift register
10. Implement any three (given above) on FPGA/CPLD kit

Note: Ten experiments are to be performed out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.
List of Experiments:

1. Introduction to NOKIA mobile toolkit and study various operations performed on nokia mobile browser.
2. To perform operation on location management.
3. To perform operation on DSR
4. To perform experiment on DSDV
5. To perform experiment on ZRP
6. To perform experiment on LSR
7. To perform experiment on on demand DSDV
8. To perform experiment on FSR
9. To perform experiment on HSR
10. to study about the self jamming problem in CDMA and to study near-far effect in CDMA systems.
List of Experiments:

**Study of Visual Basic 6.0.NET**
1) Study Windows API’s. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.

2) Get familiar with essential classes in a typical (Document- view architecture) VB Program and their relationship with each other.

3) Create an SDI application in VB that adds a popup menu to your application which uses File drop down menu attached with the menu bar as the pop-up menu. The pop-up menu should be displayed on the right click of the mouse.

4) Create an SDI application in VB using which the user can draw at most 20 rectangles in the client area. All the rectangles that are drawn should remain visible on the screen even if the window is refreshed. Rectangle should be drawn on the second click of the left mouse button out of the two consecutive clicks. If the user tries to draw more than 20 rectangles, a message should get displayed in the client area that “No more rectangles can be drawn”

5) Create an application in VB that shows how menu items can be grayed, disabled and appended at run time.

6) Write a program in VB to implement serialization of inbuilt and user defined objects.

7) Write a program in VB to create archive class object from CFile class that reads and stores a simple structure (record).

8) Make an Active X control in VB derived from a standard control.
9) Write a program in VB to implement a simple calculator.
10) Create a simple database in MS Access Database /Oracle and a simple database application in VB that shows database connectivity through DAO and ADO.

11) Write a simple program that displays an appropriate message when the illegal operation is performed using error handling technique in VB.

12) Write a program in VB to create a notepad.

13) Create a DLL in VB.

Note: At least 3 to 5 more exercises to be given by the teacher concerned.
LIST OF EXPERIMENTS

1. Study of PROLOG.  
Write the following programs using PROLOG.

2. Write a program to solve 8 queens problem.


5. Solve 8-puzzle problem using best first search.


7. Solve traveling salesman problem.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.
Semester-7

CSL-401                        Advanced Computer Architecture

L   T   P       Total Credits=3.5
3   1   -

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – 1
Parallel computer models: The state of computing, Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks
Program and network properties: Conditions of parallelism, Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Program flow mechanisms, Control flow versus data flow, Data flow architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

UNIT – 2
System Interconnect Architectures: Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory, Multistage and combining network.
Processors and Memory Hierarchy: Advanced processor technology, Instruction-set Architectures, CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors
Memory Technology: Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology.

UNIT – 3
Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.
Pipelining: Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines

UNIT – 4
Vector Processing Principles: Vector instruction types, Vector-access memory schemes.

Text Books:

References Books:
CSL-421 Unix and Linux Programming

L T P Total Credits: 3.5

3 1 0

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1
Linux Startup
User accounts, accessing linux – starting and shutting processes, Logging in and Logging out, Command line, simple commands

Shell Programming
Unix file system: Linux/Unix files, inodes and structure and file system related commands, Shell as command processor, shell variables, creating command substitution, scripts, functions, conditionals, loops, customizing environment

Unit-2
Regular Expressions and Filters
Introducing regular expressions patterns, syntax, character classes, quantifiers, introduction to egrep, sed, programming with awk and perl.

Unit-3
The C Environment
The C compiler, vi editor, compiler options, managing projects, memory management, use of makefiles, dependency calculations, memory management – dynamic and static memory, building and using static and dynamic libraries, using ldd, soname, dynamic loader, debugging with gdb

Unit-4
Processes in Linux
Processes, starting and stopping processes, initialization processes, rc and init files, job control – at, batch, cron, time, network files, security, privileges, authentication, password administration, archiving, Signals and signal handlers, Linux I/O system

Text Books

CSL-307                        Computer Graphics

L      T      P                  Total Credits=3.5
3      1      -

Duration of Exam: 3 Hrs.

Note:   Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Transformation, Projections, and Clipping Algorithms: Bresenham’s Line Drawing Algorithm, Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, Sutherland-Cohen Clipping Algorithm.

UNIT – II
Curves and Surfaces: Bresenham’s Circle Drawing Algorithm, Bezier Curves, 4 point and 5 point Bezier curves using Bernstein Polynomials, Conditions for smoothly joining curve segments, Bezier bi-cubic surface patch, B-Spline Curves, Cubic B-Spline curves using uniform knot vectors, Testing for first and second order continuities

UNIT – III
Projection and Solid Modelling: Parallel Projection, Oblique Projection on xy plane, Isometric Projection, Perspective Projection, One Vanishing Point (V.P.) projection from a point on z axis, Generation of 2 V.P. Projection, Isometric Projection, Perspective, Projection, one vanishing Pint (VP), projection from 0 point on z axis, Generation of 2 VP Projector & Projections, Solid Modelling.

UNIT – IV

Text Books:
References Books:
CSL-306  Analysis and Design of Algorithms

L  T  P  Total Credits=3.5
3  1  -

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Divide and Conquer Approach: Merge Sort, Quick sort, Medians and Order statistics, Strassen’s algorithm for Matrix Multiplications.

UNIT – II

UNIT – III
Graph Algorithms: Representation of Graphs, Breadth First Search, Depth First Search, Topological Sort, Strongly Connected Components, Algorithm for Kruskal’s and Prim’s for finding Minimum cost Spanning Trees, Dijkstra’s and Bellman Fort Algorithm for finding Single source shortest paths. All pair shortest paths and matrix multiplication, Floyd – Warshall algorithm for all pair shortest paths.

UNIT – IV
NP-Complete Problem: Polynomial-time verification, NP-Completeness and Reducibility, NP-Completeness Proof, NP-Complete problems.

Text Books:

References Books:
CSL-408 Embedded System Design

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Introduction to an embedded systems design & RTOS: Introduction to Embedded system, Processor in the System, Microcontroller, Memory Devices, Embedded System Project Management, ESD and Co-design issues in System development Process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In-circuit emulator, Use of software tools for development of an ES. Inter-process Communication and Synchronization of Processes, Tasks and Threads, Problem of Sharing Data by Multiple Tasks, Real Time Operating Systems: OS Services, I/O Subsystems, Interrupt Routines in RTOS Environment, RTOS Task Scheduling model, Interrupt Latency and Response times of the tasks.

UNIT – II
Overview of Microcontroller: Microcontroller and Embedded Processors, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, The program Counter and ROM Spaces in the 8051, Data types, 8051 Flag Bits ad PSW Register, 8051 Register Banks and Stack Instruction set, Loop and Jump Instructions, Call Instructions, Time delay generations and calculations, I/O port programming Addressing Modes, accessing memory using various addressing modes, Arithmetic instructions and programs, Logical instructions, BCD and ASCII application programs, Single-bit instruction programming, Reading input pins vs. port Latch, Programming of 8051 Timers, Counter Programming

UNIT – III

UNIT - IV
Interfacing with 8051: Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the keyboard, Interfacing a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory.

Text Books:
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

**Unit -1:** Introduction to redundancy theory; decision theory in redundant systems.

**Unit -2:** Hardware fault tolerance, redundancy techniques, detection of faults, replication and compression techniques, self-repairing techniques, concentrated and distributed voters, models of fault tolerant computing systems, case study.

**Unit -3:** Fault diagnosis of digital circuits and systems: fault modelling, test generation, design for testability, signature analysis, built in self test. Testing of embedded systems.

**Unit -4:** Software fault tolerance: fault tolerance versus fault intolerance, errors and their management strategies, software defence, protective redundancy. Fault recovery techniques. Coding theory: application to fault tolerant system design

**Reference Books.**

1. Fault Tolerance in the advance system by S. K. Shrivastava
2. Application Level Fault Tolerance By J. Haines
3. System Structure for software Fault Tolerance by Randell
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT -1: Fundamental concepts of Object Oriented Programming: Introduction to the principles of object-oriented programming (classes, objects, messages, encapsulation, inheritance, polymorphism, exception handling, and object-oriented containers).

UNIT -2: Object design implementation in a programming language, e.g, C++ or Java. Object oriented analysis, modeling and design. UML may be introduced.

UNIT -3: Structural Modelling: classes, relationships, interfaces, class diagrams, and object diagrams, in UML. Behavioural / Functional modeling: use case diagrams, sequence diagrams, in UML.


Object oriented Database systems: Object oriented Data model, query languages, Storage Organization and Indexing Techniques; Object Relational Databases

Text Books

Reference Books.
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1: Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosoy & natural languages. Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.


Unit-3: Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Unit-4: Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

Text Book:
· “Natural Language Understanding” James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

Reference Books:
· “Language as a cognitive process”, Terry Winograd 1983, AW
· “Introduction of Formal Language Theory, Mdij Arbib & Kfaury, 1988, Springer Verlog
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit-1

**Introduction to Teletraffic & Networks**: Principles of telecoms networks, Call routing, Teletraffic dimensioning, The various telecoms networks

**Network Strategy & Planning**: Network Vision; Architecture; Technology strategy, Network strategy. The planning process, The multi-layered network model, Network planning and programmes, Simple example of planning & dimensioning

Unit-2

**Forecasting**: Need for forecasting; Forecasting techniques, Strengths & weaknesses of different techniques

**Access Network Planning**: BT’s 21st Century Network proposal and its access network limitations, Access network requirements - service and physical BT copper access network structure - including differences for Kingston Communications, Copper access network planning, TPON – A former BT vision and lessons from its failure ADSL and unbundling

**Core Transport Planning**: Transport network technologies, SDH, DWDM, IP onto WDM, Transport networks architectures, Transport network resilience (MS-SPRings, Transport network planning, Process, Node locations, Fibre connectivity, Design trade-offs, Network planning tools

Unit-3

**Network & Market Trends**: Transport technology trends, Next generation optical networks, Lambda bandwidth management, Collapse of the protocol stack, Transport network architectures, Optical bandwidth management, Transport Market trends, Capex spending, Emerging transport network opportunities, Rise of Ethernet, Strategic challenges for key players Infonetworking & e-business

**Service & Network Intelligence Planning**: Network control & intelligence, SS N0 7,IN, APIs & Parlay, NGN control, SIP, IMS, Service management: Etom, Service creation, Common capabilities
Unit-4

Next Generation Networks (NGN): Necessary characteristics of NGN, VOIP, New network structure, Multi-service platforms, Principles of NGN, NGN control, Planning issues NGN

Network Performance Planning: Introduction to performance planning, Apportionment of impairments (loudness, stability, echo, delay, error, noise, availability), Network interconnect aspects, Packet network performance, Network integrity, Network resilience

References

1. Deploying-IP-and-MPLS-QoS-for-Multiservice-Networks by John William Evans the morgan koufman series

2. BARNES & NOBLE - Find Analysis and Design of Advanced Multiservice Networks Supporting Mobility, Multimedia, and Internetworking by Jose Brazio.

3. Telecommunication Essentials by Lillian Goleniewski
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

**Unit -1:** Fundamental concepts (basic definitions, operations, properties, proof styles);

**Unit -2:** Trees (properties, distances and centroids, spanning trees, enumeration); Matchings (bipartite graphs, general graphs, weighted matching); Connectivity (vertex and edge connectivity, cuts, blocks, k-connected graphs, network flows); Traversibility (Eulerian tours, Hamiltonian cycles);

**Unit -3:** Coloring (vertex and edge coloring, chromatic number, chordal graphs); Planarity (duality, Euler's formula, characterization, 4-color theorem);

**Unit 4:** Advanced topics (perfect graphs, matroids, Ramsay theory, extremal graphs, random graphs); Applications.

**References:**

1. Applied Graph Theory: Graphes & Electrical Networks by Chen
2. Graph Theory by Narsingh Deo
3. Graph Theory by Christofides
Students may choose a project based on any subject of Computer Science. The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.
List of Experiments:

1. Familiarize with Unix/Linux logging/logout and simple commands.
2. Familiarize with vi editor and Linux GUIs.
3. Using Bash shell develop simple shell programs.
4. Develop advanced shell programs using awk and grep.
5. Compile and debug various C programs using different options.
6. Learning of installation and upgradation of Linux operating system.
7. Install Linux on a PC having some other previously installed operating system. All OSs should be usable.
8. As supervisor create and maintain user accounts, learn package installation, taking backups, creation of scripts for file and user management, creation of startup and shutdown scripts using at, cron etc.

**NOTE:** At least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.
List of programs

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for circle drawing as Raster Graphics Display.
3. Write a program for polygon filling as Raster Graphics Display.
4. Write a program for line clipping.
5. Write a program for polygon clipping.
6. Write a program for displaying 3D objects as 2D display using perspective transformation.
7. Write a program for rotation of a 3D object about arbitrary axis.
8. Write a program for Hidden surface removal from a 3D object.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.
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A Departmental Committee will evaluate the performance of the students & marks will be awarded accordingly.
ITP-429  Practical Training

L  T  P  Total CreditS=2
-  -  -

Practical training conducted after sixth semester will be evaluated in the Seventh Semester based on Viva-Voce.
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

**Unit – I**
Review of Physical & Data link layer, ISDN, Frame Relay, ATM

**Unit – II**

**Unit – III**
Transport Layer: UDP, TCP (Flow Control, Error Control, Connection Establishment)

**Unit – IV**
Application layer: DNS, SNMP, RMON, Electronic Mail, WWW.

Network Security: Firewalls (Application and packet filtering), Cryptography, Virtual Print,

**Text Books:**

**Reference Books:**
ECL-306 Wireless Communication

Total Credits =3.5

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit 1.

Introduction to Wireless Communication Systems:
Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

Modern Wireless Communication Systems:
Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

Unit 2.

Introduction to Cellular Mobile Systems:

Cellular System Design Fundamentals:
Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

Unit 3.

Multiple access Techniques for Wireless Communication:
Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio protocols, CSMA, reservation protocols, capacity of a cellular systems.

Unit 4.

Wireless Networking:
Introduction, Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.
Intelligent Cell Concept and Application:
Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

Text Books:

References:
3. Mobile Communications: Jochen Schiller; Pearson
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

Unit – I
Introduction to Java: Importance and features of Java, Keywords, constants, variables and Data Types, Operators and Expressions, Decision Making, Branching and Looping: if..else, switch,?: operator, while, do, for statements, labeled loops, jump statements: break, continue return. Introducing classes, objects and methods: defining a class, adding variables and methods, creating objects, constructors, class inheritance.
Arrays and String: Creating an array, one and two dimensional arrays, string array and methods, Classes: String and StringBuffer classes, Wrapper classes: Basics types, using super, Multilevel hierarchy abstract and final classes, Object class, Packages and interfaces, Access protection, Extending Interfaces, packages.

Unit – II

Unit – III

Unit – IV
Website Designing: Overview of Internet and Intranet Services, Sending and Receiving Mails, HTML Tags, Creating Tables, Check Boxes, Text Books, Frames, Graphical and animation techniques, Static & Dynamic Web Pages, Guidelines for a good website design, DHTML, ASP, Javascript

Text Books:

**References Books:**

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – 1
**Introduction to Compilers:** Compilers and translators, need of translators, structure of compiler: its different phases, Compiler construction tools.

UNIT – 2
**Lexical Analysis:** Role of lexical analyzer, design of lexical analyzer, regular expressions Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

**Syntax Analysis:** Role of parsers, context free grammars, definition of parse trees.

UNIT – 3
**Parsing Technique:** Shift-reduce parsing, operator precedence parsing, top down parsing, predictive parsing. LR parsers, SLR, LALR and Canonical LR parsers.

**Syntax Directed Translations:** Syntax directed definition, construction of syntax trees, syntax directed translation scheme, and implementation of syntax directed translation, three address code, quadruples and triples.

UNIT – 4
**Symbol Table & Error Detection and Recovery:** Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

**Code Optimization & Code Generation:** Principle sources of optimization, loop optimization, Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

**Text Books:**
2. Principles of compiler Design, Narosa Publication

**Reference Books**
2. System Software, Dhamdhere, Prentice Hall Ullman,
NOTE: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
Introduction: Sampling theorem, frequency domain representation, reconstruction of band limited signal from its samples, discrete time processing of continuous time signals, changing the sampling rate using discrete time processing, Applications of DSP. Discrete Fourier Series and Discrete-Time Fourier Transform, DFT as a linear transformation—relationship to other transforms—properties of DFT—Linear filtering methods based on DFT—frequency analysis of signals using DFT—Efficient computations of the DFT—FFT algorithms—direct computation, divide-and-conquer approach, radix-2, radix-4 and split radix algorithms—implementation of FFT algorithms—Applications of FFT.

UNIT 2
Realization of Digital Filters: solution of difference equations of digital filters, System function, stability criterion, frequency response of stable systems; Realization—direct, canonic, cascade and parallel forms, lattice and transposed structures, representation of numbers & errors due to rounding, truncation, Quantization of filter coefficients, round off effects in digital filters, limit cycle oscillations, scaling for overflow prevention.

UNIT 3
FIR Digital Filters: Characteristics, frequency response, Design of FIR filters using window techniques, Frequency sampling technique, Comparison of IIR & FIR filters.

UNIT 4
Multirate DSP: Decimation, interpolation, sampling rate conversion, filter design and implementation for sampling rate conversion.
DSP Processors: Introduction to programmable DSPs: Multiplier and Multiplier Accumulator (MAC), Modified bus structures and memory access schemes in DSPs Multiple access memory, Multiport memory, VLSI Architecture, Pipelining, Special addressing modes, On-Chip Peripherals.

Text Books:

References:
Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
**Introduction:** Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

**General Purpose Processors:** Basic architecture, operation, Pipelining, Programmer’s view, development environment, Application Specific Instruction-Set Processors (ASIPs)–Micro Controllers and Digital Signal Processors.

UNIT 2
**State Machine And Concurrent Process Models:** Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model(PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

**Communication Interface:** Need for communication interfaces, RS232/UART, RS422/RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT 3
**Embedded/RTOS Concepts–I:** Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex.

**Embedded/RTOS Concepts–II:** Mailboxes, Message Queues, Event Registers, Pipes, Signals.

UNIT 4
**Embedded/RTOS Concepts–III:** Timers, Memory Management, Priority inversion problem, Embedded operating systems Embedded Linux, Real-time operating systems, RT Linux, Handheld operating systems, Windows CE.


**TEXT BOOKS:**

**REFERENCES:**
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

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

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

Unit-2

Unit-3
Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Unit-4
Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

Text Book:
• “Natural Language Understanding” James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

Reference Books:
• “Language as a cognitive process”, Terry Winograd 1983, AW
• “Natural Language processing in prolog” G. Gazder, 1989, Addison Wesley.
• “ Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT – I
Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

UNIT - II
Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.
Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

UNIT - III
Reducing the number of test cases:
Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing

UNIT - IV

and Failure Containment, Comparing Quality Assurance Techniques and Activities, Feedback Loop and Activities for Quantifiable Quality Improvement, Quality Models and Measures, Defect Classification and Analysis, Risk Identification for Quantifiable Quality Improvement, Software Reliability Engineering

**Text Books:**

7. Pressman : Software Engineering, TMH.
8. Ghazzi, Carlo : Fundaments of Software Engineering, PHI.

**Reference Books:**

CSL-302 Distributed Operating System

Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.


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

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

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

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

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

Text Book:

- Distributed Operating System – Andrew S. Tanenbaum, PHI.
- Distributed Operating System – P. K. Sinaha, Wesley Publisher
Duration of Exam: 3 Hrs

Note: Eight questions will be set in all by the examiners taking two questions from each unit. Students will be required to attempt five questions in all selecting at least one question from each unit.

UNIT 1
Digital Communication basics: Source encoding, Channel encoding, Circuit switched Networks; Packet switched networks, ATM, Frame Relay.

UNIT 2
Multimedia Information Representation: Different types of multimedia information, Information representation.
Compression Techniques: Encoding and decoding techniques, Text compression techniques, Image compression techniques, Audio and Video Compression, Standards for Multimedia Compression, Huffman, Run length, Variable length, Lossy/Lossless compression.

UNIT 3
Multimedia File Formats
Various file formats for multimedia and their applications, BMP, PNG, TIFF, JPEG, DFX, AVI, MPEG Audio/Video Standards, Challenges for encryption and decryption.

UNIT 4
World Wide Web

Books Recommended:
1. Multimedia Communications by Fred Halsall, Prentice Hall.
3. Internet Resources.
4. Related IEEE/IEE publications.
Students may choose a project based on any subject of Computer Science. The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.
LIST OF EXPERIMENTS

Development of programs relating to:

- JDBC
- Servlets
- Beans
- RMI
- JSP
ITP-422   Seminar

L  T  P  Total Credit=1
-  -  2

Duration of Exam: 3 Hrs

A Departmental Committee will evaluate the performance of the students & marks will be awarded accordingly.
LIST OF EXPERIMENTS

Practice of LEX/YACC of compiler writing

2. Write a program to check whether a string belong to the grammar or not.

3. Write a program to generate a parse tree.

4. Write a program to find leading terminals

5. Write a program to find trailing terminals.

6. Write a program to compute FIRST of non-terminal.

7. Write a program to compute FOLLOW of non-terminal.

8. Write a program to check whether a grammar has left Recursion and remove it.

9. Write a program to remove left factoring.

10. Write a program to check whether a grammar is operator precedence.

11. To show all the operations of stack

12. To show various operations, i.e. read, write and modify in a text file.

Note: At least 10 programs are required to be developed in the semester.
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GFP-424  General Proficiency

Total Credits=2