

## ACADEMIC REGULATIONS COURSE STRUCTURE AND DETAILED SYLLABUS

### COMPUTER SCIENCE AND ENGINEERING

*for*

**B.TECH. FOUR YEAR DEGREE COURSE**  
(Applicable for the batches admitted from 2005-2006)



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
KUKATPALLY, HYDERABAD - 500 072 (A.P.)

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD.

### B. TECH. COMPUTER SCIENCE AND ENGINEERING I Year COURSE STRUCTURE

Code	Subject	T	P	C
HS 05231	English	2+1*	-	4
MA 05363	Mathematics – I	3+1*	-	6
MA 05361	Mathematical Methods	3+1*	-	6
PY 05047	Applied Physics	2+1*	-	4
CS 05106	C Programming and Data Structures	3+1*	-	6
EE 05068	Basic Electrical Engineering	2+1*	-	6
EC 05210	Electronic Devices and Circuits	3+1*	-	6
ME 05220	Engineering Drawing Practice Lab	-	3	4
CS 05144	Computer Programming Lab	-	3	4
EE 05188	Electrical and Electronics Lab	-	3	4
HS 05232	English Language communication skills Lab	-	3	4
CS 05337	IT Work-Shop	-	3	4
<b>Total</b>		<b>25</b>	<b>15</b>	<b>56</b>

### II Year COURSE STRUCTURE I Semester

Code	Subject	T	P	C
MA 05476	Probability & Statistics	4+1*	-	4
CS 05360	Mathematical Foundations of Computer Science	4+1*	-	4
CS 05007	Advanced Data Structures	4+1*	-	4
CS 05175	Digital Logic Design	4+1*	-	4
CS 05140	Computer Organization	4+1*	-	4
CS 05159	Data Base Management Systems	4+1*	-	4
CS 05008	Advanced Data Structures (C++) Lab	-	3	2
CS 05157	Data Base Management Systems Lab.	-	3	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>28</b>

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**B. TECH. COMPUTER SCIENCE AND ENGINEERING**

II Year II Semester

**COURSE STRUCTURE**

Code	Subject	T	P	C
CS 05521	Software Engineering	4+1*	-	4
CS 05160	Design and Analysis of Algorithms	4+1*	-	4
CE 05239	Environmental Studies	4+1*	-	4
EC 05471	Principles of Communications	4+1*	-	4
EC 05400	Microprocessors and Interfacing	4+1*	-	4
CS 05434	OOPS through Java	4+1*	-	4
CS 05338	Java Lab	-	3	2
EC 05401	Microprocessors Lab	-	3	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>28</b>

III Year

**COURSE STRUCTURE**

I Semester

Code	Subject	T	P	C
CS 05263	Formal Languages and Automata Theory	4+1*	-	4
CS 05432	Object Oriented Analysis and Design	4+1*	-	4
HS 05353	Managerial Economics & Financial Analysis	4+1*	-	4
CS 05435	Operating Systems	4+1*	-	4
CS 05138	Computer Networks	4+1*	-	4
CS 05475	Principles of Programming Languages	4+1*	-	4
CS 05564	UML Lab	-	3	2
CS 05139	Computer Networks & Operating System Lab	-	3	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>28</b>

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**B. TECH. COMPUTER SCIENCE AND ENGINEERING**

III Year II Semester

**COURSE STRUCTURE**

Code	Subject	T	P	C
CS 05137	Computer Graphics	4+1*	-	4
CS 05130	Compiler Design	4+1*	-	4
CS 05566	UNIX Programming	4+1*	-	4
CS 05317	Information Security	4+1*	-	4
CS 05424	Neural Networks	4+1*	-	4
CS 05523	Software Testing Methodologies	4+1*	-	4
CS 05318	Information Security Lab	-	3	2
CS 05567	UNIX Programming and Compiler Design Lab.	-	3	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>28</b>

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**B. TECH. COMPUTER SCIENCE AND ENGINEERING**

IV Year I Semester

**COURSE STRUCTURE**

Code	Subject	T	P	C
CS 05216	Embedded Systems	4+1*	-	4
CS 05579	Web Technologies	4+1*	-	4
CS 05158	Data Warehousing and Data Mining	4+1*	-	4
CS 05522	Software Project Management	4+1*	-	4
	<b>ELECTIVE - I :</b>	4+1*	-	4
CS 05048	Artificial Intelligence			
CS 05412	Mobile Computing			
CS 05419	Multimedia and Application Development			
	<b>ELECTIVE - II :</b>	4+1*	-	4
CS 05004	Advanced Computer Architecture			
CS 05129	Client server Computing			
CS 05423	Network Management Systems			
CS 05217	Embedded Systems Lab	-	3	2
CS 05580	Web Technologies Lab	-	3	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>28</b>

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
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**B. TECH. COMPUTER SCIENCE AND ENGINEERING**

IV Year II Semester

**COURSE STRUCTURE**

Code	Subject	T	P	C
HS 05352	Management Science	4+1*	-	4
	<b>ELECTIVE III :</b>	4+1*	-	4
CS 05302	Image Processing			
CS 05185	E-Commerce			
CS 05180	Distributed Databases			
	<b>ELECTIVE - IV :</b>	4+1*	-	4
CS 05573	Virtual Reality			
CS 05294	Human Computer Interface			
CS 05005	Advanced Computing Concepts			
CA 05315	Industry Oriented Mini Project	-	-	2
CA 05515	Seminar	-	-	2
CA 05495	Project Work	-	-	12
<b>Total</b>		<b>15</b>	<b>-</b>	<b>28</b>

**Note :** All End Examinations (Theory and Practical) are of three hours duration.

\* - Tutorial

T - Theory

P - Practical

C - Credits

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

I Year B.Tech. CSE

T P C  
2+1 0 4

**(HS 05231) ENGLISH**

**1. INTRODUCTION :**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks, to encourage them to develop their language skills. The two textbooks identified by the Board of Studies serve the purpose of illustrating the conceptual framework within which the syllabus is to be administered in the classroom. When a textbook is prescribed content is generally paid attention to. However, the stress in this syllabus is on language acquisition and skill development, calling for both the teacher and the taught to go beyond the prescribed texts and innovate exercises and tasks.

**2. OBJECTIVES :**

1. To promote the language proficiency of the students with emphasis on improving their LSRW skills.
2. To impart training to the students through the syllabus and its theoretical and practical components.
3. To improve communication skills in formal and informal situations.

**3. SYLLABUS :**

**Listening Skills :**

- Listening for general content
- Listening to fill up information gaps
- Intensive listening
- Listening for specific information
- Note-taking - guided and unguided
- Post-listening testing

**Speaking Skills :**

- Oral practice
- Developing confidence
- Introducing oneself/others
- Asking for/ giving information
- Describing objects/offering solutions
- Describing situations
- Role play

**Expressing agreement/disagreement**

**Reading Comprehension**

- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence

- Inferring lexical and contextual meaning
- Understanding discourse features
- Recognizing coherence/sequencing of sentences

**NOTE :** The student, through the training imparted to him/her by means of the text-based approach, will be examined in answering questions on an unseen passage.

**Writing Skills :**

- Writing a sentence
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Interpreting data
- Formal and informal letter writing
- Sending e-mails
- Information transfer
- Editing a passage

#### 4. TEXTBOOKS PRESCRIBED :

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Eight Units, are prescribed:

1. **LEARNING ENGLISH:** A Communicative Approach, Hyderabad: Orient Longman, 2005 (Selected Lessons)
2. **WINGS OF FIRE:** An Autobiography – APJ Abdul Kalam, Abridged version with Exercises, Hyderabad: Universities Press (India) Pvt. Ltd., 2004.

The following lessons from the prescribed texts are recommended for study :

#### A. STUDY MATERIAL :

##### Unit – I

1. **Astronomy** from **LEARNING ENGLISH: A Communicative Approach**, Orient Longman, 2005.
2. **Chapters 1-4** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004**

##### Unit – II

3. **Information Technology** from **LEARNING ENGLISH: A Communicative Approach**, **Orient Longman, 2005.**

4. **Chapters 5-8** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004**

##### Unit – III

5. **Humour** from **LEARNING ENGLISH: A Communicative Approach**, **Orient Longman, 2005.**
6. **Chapters 9-12** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004**

##### Unit – IV

7. **Environment** from **LEARNING ENGLISH: A Communicative Approach**, **Orient Longman, 2005.**
8. **Chapters 13-16** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004**

##### Unit – V

9. **Inspiration** from **LEARNING ENGLISH: A Communicative Approach**, **Orient Longman, 2005.**
10. **Chapters 17-20** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004.**

##### Unit – VI

11. **Human Interest** from **LEARNING ENGLISH : A Communicative Approach**, **Orient Longman, 2005.**

12. **Chapters 21-24** from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises**, **Universities Press (India) Pvt. Ltd., 2004.**

\* Exercises from the lessons not prescribed shall also be used for classroom tasks.

##### Unit – VII

- Reading and Writing Skills
- Reading Comprehension
- Situational dialogues
- Report writing
- Letter writing
- Essay writing
- Information transfer

##### Unit – VIII

- Remedial English
- Common errors
- Subject-Verb agreement
- Use of Articles and Prepositions
- Tense and aspect

**Vocabulary – Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.**

#### BTEXT BOOKS :

1. **Effective Technical Communication**, M Ashraf Rizvi, Tata McGraw-Hill Publishing Company Ltd.

2. **Everyday Dialogues in English**, Robert J Dixon, Prentice Hall of India Pvt Ltd., New Delhi.

#### REFERENCES :

1. **Strengthen Your English**, Bhaskaran & Horsburgh, Oxford University Press
2. **English for Technical Communication**, K R Lakshminarayana, SCITECH
3. **Strategies for Engineering Communication**, Susan Stevenson & Steve Whitmore (John Wiley and sons).
4. **English for Engineers: With CD**, Sish Chaudhary, Vikas Publishing House Pvt. Ltd. With CD.
5. **Basic Communication Skills for Technology**, Andrea J Rutherford, Pearson Education Asia.
6. **Murphy's English Grammar with CD**, Murphy, Cambridge University Press
7. **A Practical Course in English Pronunciation, (with two Audio cassettes)**, Sethi, Sadanand & Jindal, Prentice –Hall of India Pvt Ltd., New Delhi.
8. **English for Professional Students**, by S S Prabhakara Rao.
9. **The Oxford Guide to Writing and Speaking**, John Seely, Oxford
10. **Grammar Games**, Renvoluch Mario, Cambridge University Press.

## (MA 05363) MATHEMATICS – I

## UNIT – I

Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence. Rolle's theorem – Lagrange's Mean Value Theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem).

## UNIT – II

Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints or without constraints- Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

## UNIT – III

Curve tracing – Cartesian , polar and Parametric curves - Applications of integration to lengths , volumes and surface areas in Cartesian and polar coordinates.

## UNIT – IV

Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, Orthogonal trajectories- Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ , polynomials in  $x$ ,  $e^{ax}V(x)$ ,  $xV(x)$ , method of variation of parameters.

## UNIT – V

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms- Application of Laplace transforms to ordinary differential equations.

## UNIT – VI

Multiple integrals - double and triple integrals – change of variables – change of order of integration.

## UNIT – VII

Vector Calculus: Gradient- Divergence- Curl and their related properties of sums- products- Laplacian and second order operators. Vector Integration - Line integral – work done – Potential function – area- surface and volume Integrals.

## UNIT – VIII

Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem. Verification of Green's - Stoke's and Gauss's Theorems – Cylindrical, Spherical coordinates- Expressions Grad, div, curl in spherical and cylindrical coordinates.

## TEXT BOOKS :

1. A text book of Engineering Mathematics Volume – 1, 2005  
T. K. V. Jyengar, B. Krishna Gandhi and others, S. Chand and Company.
2. Engineering Mathematics, B. V. Ramana, Tata McGraw-Hill 2003.

## REFERENCES :

1. Engineering Mathematics-I, 2002, P. Nageswara Rao, Y. Narsimulu, Prabhakara Rao, Deepthi Publishers
2. Engineering Mathematics- I, 2004, Dr. Shahnaz Bathul, Right Publishers.
3. Engineering Mathematics, S. K. V. S. Sri Rama Chary, M. Bhujanga Rao, Shankar, B. S. Publications 2000.
4. Engineering Mathematics-I Rukmangadhachary, Pearson Education.
5. A Text book of Engineering Mathematics, VP Mishra, Galgotia Publications.
6. Engineering Mathematics – I, Sankaralah, VGS Book Links, Hyderabad.

**(MA 05361) MATHEMATICAL METHODS****UNIT - I**

Solution of Algebraic and Transcendental Equations : Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

**Interpolation :** Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences – Central differences – Symbolic relations and separation of symbols- Differences of a polynomial-Newton's formulae for Interpolation – Central difference Interpolation Formulae – Gauss' Central Difference Formulae – Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

**UNIT - II**

Fitting a straight line – Nonlinear curve fitting – Curve fitting by a sum of exponentials- Weighted least squares approximation-Linear weighted least squares approximation-Nonlinear weighted least squares.

Numerical Differentiation and Integration: The Cubic Spline Method – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule- Boole's and Weddle's Rules.

**UNIT - III**

Numerical solution of Ordinary Differential equations: Solution by Taylor's series- Picard's Method of successive Approximations- Euler's Method- Runge-Kutta Methods – Predictor-Corrector Methods- Adams-Moulton Method – Milne's Method.

**UNIT – IV**

Matrices and Linear systems of equations: Elementary row transformations-Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- LU Decomposition- LU Decomposition from Gauss Elimination – Solution of Tridiagonal Systems- Solution of Linear Systems.

**UNIT - V**

Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix – Modal and spectral matrices.

**UNIT - VI**

Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation - Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties.

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - Index - signature - Sylvester law.

**UNIT – VII**

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

Fourier integral theorem (only statement) – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – properties – Inverse transforms – Finite Fourier transforms.

**UNIT - VIII**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations. Method of separation of variables.

z-transform – inverse z-transform - properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equation by z-transforms.

**TEXT BOOKS :**

1. A Text book of Engineering Mathematics Volume – II, 2005 T.K.V.Jyengar, B.Krishna Gandhi and others, S.Chand and Company.
2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

**REFERENCES :**

1. Engineering Mathematics–II, 2002, P. Nageswara Rao, Y.Narsimulu, Prabhakara Rao
2. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar. B.S.Publications 2000.
3. Advanced Engineering Mathematics (eighth edition), Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. 2001.
4. Advanced Engineering Peter V.O'Neil Thomson Brooks/Cole.
5. Advanced Engineering Mathematics, Merle C.Potter, J.L.Goldberg, E.F.Abrutadel, Oxford University Press. Third Edition 2005.
6. Numerical Methods: V.N.Vedamurthy, Jyengar N.Ch.N.Vikas pub. Reprint 2005
7. Numerical Methods: S.Arannugam & others. Scitech pub.
8. Elementary Numerical Analysis : An Algorithmic Approach: S.D.Conte and Carl D.E.Boor, Tata Mac-Graw Hill.
9. Introductory Methods of Numerical Analysis: S.S.Sastry, Prentice Hall of India, Pvt Ltd,
10. Engineering Mathematics – II, 2005, Sankarajah, VGS Book Links, Hyderabad.
11. Numerical Methods for Scientific and Engineering Computation: M.K.Jain, S.R.K. Jyengar, R.K.Jain, New Age International (P) Ltd.



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD**

I Year B.Tech. CSE

T P C  
2+1 0 4

**(PY 05047) APPLIED PHYSICS**

**UNIT I**

**BONDING IN SOLIDS** : Introduction - Types of Bonding - Ionic bond - Covalent bond - Metallic bond - Cohesive energy - Calculation of Cohesive energy.

**CRYSTAL STRUCTURES** : Introduction -Space lattice -Basis - Unit cell - Lattice parameter - Crystal systems - Bravais lattices - Structure and Packing fractions of Simple cubic - Body Centred Cubic - Face Centred Cubic crystals - Structures of Diamond, ZnS, NaCl, CsCl.

**UNIT II**

**CRYSTAL PLANES & X-RAY DIFFRACTION** : Directions and Planes in crystals – Miller Indices - Separation between successive {h k l}planes - Diffraction of X-rays by Crystal planes - Bragg's Law - Laue method - Powder method.

**UNIT III**

**DEFECTS IN SOLIDS** : Imperfections in Crystals - Point defects - Schottky and Frenkel defects - Energy for formation of a Vacancy - Equilibrium concentration of Schottky and Frenkel defects - Line defects - Edge and Screw dislocations - Burger's Vectors.

**PRINCIPLES OF QUANTUM MECHANICS** : Waves and Particles - Planck's quantum theory - de-Broglie hypothesis – Matter waves - Davission and Germer experiment- Schrodinger's Time Independent Wave equation - Physical significance of the Wave function - Particle in a one dimensional potential box.

**UNIT IV**

**ELECTRON THEORY OF METALS** : Classical free electron theory - Mean free path - Relaxation time and drift velocity - Fermi-Dirac distribution (descriptive) - Quantum free electron theory - Sources of electrical resistance - Kronig-Penney model (qualitative treatment) - Origin of energy band formation in solids - Concept of effective mass.

**UNIT V**

**DIELECTRIC PROPERTIES**:Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizabilities - Internal fields - Clausius-Mossotti equation – Frequency dependence of the polarizability - Ferro and Piezo electricity.

**MAGNETIC PROPERTIES** : Permeability - Magnetization - Origin of magnetic moment - Classification of magnetic materials - Dia, Para and Ferro magnetism - Hysteresis curve - Soft and Hard magnetic materials - anti-Ferro and Ferri magnetism - Ferrites and their applications.

**UNIT VI**

**SEMICONDUCTORS** : Introduction - Intrinsic semiconductor and carrier concentration – Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein's equation - Hall effect.

**SUPERCONDUCTIVITY** : General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization - Josephson Effect - BCS Theory - Applications of superconductors.

**UNIT VII**

**LASERS** : Introduction - Characteristics of Lasers - Spontaneous and Stimulated Emission of radiation - Einstein's coefficients - Population inversion - Ruby Laser - Helium-Neon Laser - Semiconductor Laser - Applications of Lasers in Industry, Scientific and Medical fields.

**UNIT VIII**

**FIBER OPTICS** : Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture - Step-index fiber and transmission of signal in SI fiber - Graded-index fiber and transmission of signal in GI fiber - Attenuation in optical fibers - Advantages of optical fibers in communication - Application of optical fibers in Medicine and Sensors.

**TEXTBOOKS** :

1. Applied Physics by Dr. M. Chandra Shekar & Dr.P. Appala Naidu. V.G. S. Book links.
2. Solid State Physics by P.K. Palanisamy. Satech Publications (India) Pvt.ltd.

**REFERENCES** :

1. Materials Science and Engineering by V. Raghavan; Prentice-Hall India
2. Materials Science by M.Arumugam; Anuradha Agencies
3. Solid State Physics by N.W. Ashcroft & N David Merwin, Thomson Learning
4. Solid State Physics by Dr. B.S. Bellurbi & Dr. Adeel Ahmad; Premier Publishing house
5. Solid State Physics by Mani Naidu; Vijayam Publications
6. Materials Science by M.S. Vijaya & G. Rangarajan; Tata McGraw Hill
7. Introduction to Solid State Physics by C.Kittel; Wiley Eastern limited



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. CSE

T	P	C
3+1	0	6

## (CS 05106) C PROGRAMMING AND DATA STRUCTURES

## UNIT - I

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values, arithmetic, relational and logical operator, increment and decrement operators, conditional operator, bit-wise operators, type conversions, expressions, evaluation, input-output statements, blocks, if and switch statement, while, do-while and for statements, C programs covering all the above aspects.

## UNIT - II

One dimensional & Two dimensional arrays, initialization, string variables-declaration, reading, writing, Basics of functions, Parameter passing,String handling function, user-defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, example C programs.

## UNIT - III

**Pointer and Arrays :** Pointers and addresses, Pointers and Arrays, Pointers And function arguments, Address arithmetic, character pointers and functions, pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, commandline arguments, pointers to functions.

## UNIT - IV

**Structures :** Definition, initializing, assigning values, passing of structures as arguments, Arrays of structures, pointers to structures, self referential structures. Unions, typedef, bit fields, C program examples.

## UNIT - V

**Console & File I/O :** Standard I/O, Formatted I/O, opening & closing of files, I/O operations on files.

## UNIT - VI

**Linear DataStructures :** Introduction to DataStructures, representing stacks and queues in C using arrays, Infix, Postfix & Prefix programs, circular queues.

## UNIT - VII

**Linked Lists :** Singly linked list, Doubly linked list, Circular List, representing stacks and Queues in C using linked lists

**Non-Linear Data Structures :** Binary trees: Representation, tree traversals, graph representation, graph traversal, Spanning trees.

## UNIT - VIII

**Sorting & Searching :** Searching Methods- Linear and binary search methods, Sorting methods- Ex: Bubble sort, Selection sort, Insertion sort, heap sort, quick sort.

## TEXT BOOKS :

1. C And Data structures – P.Padmanabham, BS Publications
2. C & Data Structures, Ashok N.Kamthane, Pearson Education

## REFERENCES :

1. C & Data Structures – Prof. P.S.Deshpande, Prof. O.G.Kakde, Wiley Dreamtech Pvt. Ltd, NewDelhi.
2. DataStructures Using C – A.S.Tanenbaum, PHI/Pearson education.
3. The C Programming Language, B. W. Kernighan, Dennis M.Ritche, PHI/Pearson Education

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. CSE

T	P	C
2+1	0	4

## (EE 05068) BASIC ELECTRICAL ENGINEERING

## UNIT - I

**Introduction to Electrical Engineering :** Essence of electricity, Conductors, semiconductors and Insulators (elementary treatment only), Electric field, electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction. Types of induced EMF's, Kirchoff's laws. Simple problems.

## UNIT -II

**Network Analysis :** Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation, Network theorems- Superposition, Thevenin's, Maximum power transfer theorems and simple problems.

## UNIT-III

**Magnetic Circuits :** Basic definitions, analogy between electric and magnetic circuits, magnetization characteristics of Ferro magnetic materials, self inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, attracting force of electromagnets.

## UNIT-IV

**Alternating Quantities :** Principle of ac voltages, waveforms and basic definitions, relationship between frequency, speed and number of poles, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits.

## UNIT-V

**Transformers :** Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

## UNIT-VI

**Direct current machines :** Principle of operation of dc machines, armature windings, e.m.f equation in a dc machine, Torque production in a dc machine, Operation of a dc machine as a generator, operation of a dc machine as a motor.

## UNIT-VII

**A.C Machines :** Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple problems).

Synchronous Machines: Principle of operation, EMF equation (Simple problems on EMF), Synchronous motor principle and operation (Elementary treatment only)

## UNIT VIII

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## UNIT VIII

**Basic Instruments :** Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters and Voltmeters (elementary Treatment only)

## TEXT BOOKS :

1. Basic Electrical Engineering – By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

## REFERENCES :

1. Theory and Problems of Basic Electrical Engineering by D.P.Kohari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K.Mehta, S. Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.

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## (EC 05210) ELECTRONIC DEVICES AND CIRCUITS

## UNIT-I

**ELECTRON DYNAMICS AND CRO :** Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection) Applications of CRO. Voltage, Current and Frequency Measurements.

## UNIT - II

**JUNCTION DIODE CHARACTERISTICS :** Review of semi conductor Physics – n and p-type semi conductors, Mass Action Law, Continuity Equation, Hall Effect, Open-circuited p-n junction, The p-n junction as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Energy band diagram of p-n diode, Volt-ampere characteristics of p-n diode, Temperature dependence of V<sub>i</sub> characteristic, Transition and Diffusion capacitances, Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Characteristics of Tunnel Diode, Varactor Diode.

## UNIT - III

**RECTIFIERS, FILTERS AND REGULATORS :** Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, 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, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

## UNIT - IV

**TRANSISTOR CHARACTERISTICS:** Construction, principle of operation, V-I characteristics, symbol, equivalent circuit, parameter calculations, applications, and specifications of –BJT, FET, and MOSFETS, Enhancement and Depletion mode MOSFET, Salient features of different configuration of BJT and FET. Introduction to SCR, UJT, LED and Photodiode.

## UNIT -V

**BIASING AND STABILISATION :** BJT biasing, DC equivalent model, criteria for fixing operating point, methods of Bias stabilization, Thermal run away, Thermal stability, Biasing of JFET and MOSFET, Comparison of BJT, JFET and MOSFET devices.

## UNIT - VI

**AMPLIFIERS :** Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input Impedance and Output Impedance: FET and MOSFET Small signal model. (C.G, C.D, C.S configurations) R.C Coupled Amplifiers using BJT and JFET, Concepts of  $f_{\alpha}$ ,  $f_{\beta}$  and  $f_{\tau}$ .

## UNIT - VIII

**FEEDBACK AMPLIFIERS :** Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Simple problems.

**UNIT-VIII**

**OSCILLATORS :** Condition for oscillations, RC and LC type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz, Hartley, and Colpitts Oscillators, RC-phase shift and Wien-bridge oscillators.

**TEXT BOOKS :**

1. Electronic Devices and Circuits – J.Millman and C.C.Halkias, Tata McGraw Hill, 1998.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9<sup>th</sup> Edition, 2006.

**REFERENCES :**

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6<sup>th</sup> edition, 2004.
2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgoita Publications, 2<sup>nd</sup> Edn., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – K. Lal Kishore, B.S. Publications, 2<sup>nd</sup> Edition, 2005.

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**(ME 05220) ENGINEERING DRAWING PRACTICE LAB****UNIT - I**

Introduction to engineering graphics – construction of ellipse, parabola and hyperbola – cylindrical curves.

**UNIT - II**

Orthographic projections of points, lines and planes – axis inclined to one planes and inclined to both the planes.

**UNIT - III****Orthographic projections of solids :**

Cylinder, cone, prism, pyramid and sphere positions and axis inclined to both the planes.

**UNIT - IV**

Isometric projections of lines, planes and simple solids

**UNIT - V**

Conversion of orthographic views into isometric views and vice-versa.

**TEXT BOOKS :**

1. Engineering graphics By K.L. Narayana & P.Kannayya
2. Engineering drawings By N.D.Bhatt

## (CS 05144) COMPUTER PROGRAMMING LAB

- Write a C program to evaluate the following algebraic expressions after reading necessary values from the user:
  - $ax+bx-b$
  - $2.5 \log x + \cos 32^\circ + |x^2 - y^2| + \sqrt{5}xy$
  - $1/\alpha\sqrt{2}\pi e - (x-m/\sqrt{2}\sigma)^2$
- Write a C program for the following
  - Printing three given integers in ascending order
  - Sum of  $1 + 2 + 3 + \dots + n$
  - $1 + x^2/2! + x^4/4! + \dots$  upto ten terms
  - $x + x^3/3! + x^5/5! + \dots$  upto 7<sup>th</sup> digit accuracy
  - Read x and compute  $Y = 1$  for  $x > 0$   
 $Y = 0$  for  $x = 0$   
 $Y = -1$  for  $x < 0$
- Write C program using FOR statement to find the following from a given set of 20 integers.
  - Total number of even integers.
  - Total number of odd integers.
  - Sum of all even integers.
  - Sum of all odd integers.
- Write a C program to obtain the product of two matrices A of size (3X3) and B of size (3X2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.
- Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, /, \* and %). Also write the main program that uses these procedures.
- The total distance traveled by vehicle in 't' seconds is given by distance =  $ut + 1/2at^2$  where 'u' and 'a' are the initial velocity (m/sec) and acceleration (m/sec<sup>2</sup>). Write C program to find the distance traveled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

- A cloth show room has announced the following seasonal discounts on purchase of items.

Purchase Amount	Discount (Percentage)	Handloom Items
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using switch and If statements to complete the net amount to be paid by a customer.

- Given a number, write C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

- The Fibonacci sequence of numbers is 1, 1, 2, 3, 5, 8, ... based on the recurrence relation  $f(n) = f(n-1) + f(n-2)$  for  $n > 2$ .

Write C program using do-while to calculate and print the first m fibonacci numbers.

- Write C programs to print the following outputs using for loop.

```

1      1
2      2  2
3      3  3  3
4      4  4  4  4
5      5  5  5  5  5

```

- Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

- A Maruthi Car dealer maintains a record of sales of various vehicles in the following form :

Vehicle type	Month of Sales	Price (Rs.)
Maruthi – 800	02/87	75,000
Maruthi – DX	07/87	95,000
Gypsy	04/88	1,10,000
Maruthi Van	08/88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

- Write a function that will scan a character string passed as an argument and convert all lower case characters into their upper case equivalents.

- Implement the following data structures using Arrays

i) Stacks ii) Linear Queues iii) Circular queues

16. Implement binary search tree using linked list and perform the following operations.  
i) Insertion ii) Deletion iii) Inorder Traversal iv) Preorder Traversal  
v) Post Order Traversal.
17. Singly linked list and doubly linked lists  
i) Insertion ii) Deletion iii) Lookup  
iv) Implement stack using singly linked list.
18. Singly linked list and doubly linked lists  
i) Implement queue using singly linked list.  
ii) Implement the following sorting techniques.
19. Implement the following sorting techniques.  
i) Bubble Sort ii) Insertion Sort iii) Quick Sort iv) Heap Sort.
20. Implement the following searching method.  
i) Sequential Search ii) Binary Search
21. i) Conversion of Infix expression to Postfix notation.  
ii) Simple expression evaluator that can handle +, -, / and \*.
22. Implement the algorithms for the following iterative methods using C to find one root of the equation  
 $9x_1 + 2x_2 + 4x_3 = 0$   
 $x_1 + 10x_2 + 4x_3 = 6$   
 $2x_1 - 4x_2 + 10x_3 = -15$ .
23. Write Computer programs to implement the Lagrange interpolation and Newton- Gregory forward interpolation.
24. Implement in 'C' the linear regression and polynomial regression algorithms.
25. Implement Traezoidal and Simpson methods.

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**(EE 05188) ELECTRICAL AND ELECTRONICS LAB**

**PART - A**

1. Serial and Parallel Resonance – Tuning, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
7. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
8. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
9. Brake test on DC shunt motor. Determination of performance characteristics.
10. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
11. Brake test on 3-phase Induction motor (performance characteristics).
12. Regulation of alternator by synchronous impedance method

**PART - B**

1. Identification, Specifications and Testing of R, L, C Components (colour codes), Potentiometers, Switches (SPDT, DPDT and DIP), Coils, Gang Condensers, Relays, Bread Boards Identification and Specifications of active devices, Diodes, BJTs, Lowpower JFETs, MOSFETs, LEDs, LCDs, SCR, UJT, Linear and Digital ICs.
2. PN Junction Diode Characteristics: (Forward bias, Reverse bias)
3. Zener Diode Characteristics
4. Transistor CE Characteristics (Input and Output)
5. Rectifier without Filters(Full wave & Half wave)
6. Rectifier with Filters(Full wave & Half wave)
7. SCR Characteristics
8. FET Characteristics
9. CE and CC Amplifier
10. Feedback Amplifier(Voltage Series/Current series)
11. RC Phase Shift Oscillator
12. Hartely/Coplitts Oscillator



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**(HS 05232) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

The language Lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets :

- To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
  - To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.
  - To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
  - To train them to use language effectively to face interviews, group discussions, public speaking.
  - To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.
- However, depending upon the available infrastructure and budget, the above targets can also be achieved by procuring the minimum required equipment suggested for the establishment of a Conventional Lab the details of which are given below. The lab should cater to the needs of the students to build up their confidence to help them develop leadership qualities through their communicative competence.

**SYLLABUS :**

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

1. Introduction to Phonetics.
2. Introduction to Vowels and Consonants and associated Phonetic symbols.
3. Introduction to Accent, Intonation and Rhythm.
4. Situational Dialogues / Role Play.
5. Public Speaking.
6. Debate
7. Group discussions
8. Facing Interviews
9. Resume preparation
10. e-correspondence

**Minimum Requirement :**

- Computer aided multi media language lab with 30 systems with LAN facility.
- Conventional language Lab. with audio and video systems, speakers, head phones and a teacher console to accommodate 30 students.

**Suggested Software :**

- Cambridge Advanced Learners' Dictionary with exercises
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd
- Learning to Speak English - 4 CDs
- Microsoft Encarta
- Murphy's English Grammar, Cambridge
- Time series of IQ Test, Brain-teasers, Aptitude Test etc.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.

**BOOKS SUGGESTED FOR ENGLISH LAB :**

1. Developing Communication Skills by Krishna Mohan & Meera Benerji (Macmillan)
2. Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
3. Better English Pronunciation by JDO Connor (UBS – Cambridge)
4. Oxford Practice Grammar with Answers, John Eastwood, Oxford
5. Handbook of English Grammar and Usage, Mark Lester and Larry Beason, Tata McGraw-Hill
6. A text book of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
7. Lingua TOEFL CBT Insider, by Dreamtech
8. TOEFL & GRE( KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
9. English Skills for Technical Students, WBSCTE with British Council, OL
10. A Handbook of English for Competitive Examinations, by B Shyamala Rao, Blake Books, Chennai.

**DISTRIBUTION AND WEIGHTAGE OF MARKS :**

**ENGLISH LANGUAGE LABORATORY PRACTICE**

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

**(CS 05337) IT WORKSHOP****Objectives :**

The IT Workshop for engineers is a 6 training lab course spread over 90 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including MS Word, Excel, Power Point and Publisher.

**PC Hardware** introduces the students to a personal computer and its basic peripherals; the process of assembling a personal computer, installation of system software like Windows XP, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

**Internet & World Wide Web** module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

**Productivity tools** module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

**PC Hardware**

**Week 1 – Task 1 :** Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

**Week 2 – Task 2 :** Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

**Week 3 – Task 3 :** Every student should individually install windows XP on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Week 4 – Task 4 :** Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

**Week 5 – Task 5 :** Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards

**Week 6 – Task 6 : Hardware Troubleshooting :** Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

**Week 7 – Task 7 : Software Troubleshooting :** Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

**Week 8 – Task 8 :** The test consists of various systems with Hardware / Software related troubles, Formatted disks without operating systems.

**Internet & World Wide Web**

**Week 9 - Task 1 : Orientation & Connectivity Boot Camp :** Students should get connected to their Local Area Network and access the internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Week 10 - Task 2 : Web Browsers, Surfing the Web :** Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Week 11 - Task 3 : Search Engines & Netiquette :** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

**Week 12 - Task 4 : Cyber Hygiene :** Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

**Week 13 Module Test** A test which simulates all of the above tasks would be crafted and given to the students.

**LaTeX and Microsoft Word**

**Week 14 – Word Orientation :** The mentor needs to give an overview of LaTeX and Microsoft word : Importance of LaTeX and MS Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

**Task 1 : Using LaTeX and word** to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

**Week 15 - Task 2 : Creating project abstract** Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

**Week 16 - Task 3 : Creating a Newsletter :** Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

**Week 17 - Task 4 : Creating a Feedback form** - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word.

**Week 18 - LaTeX and Word Module Test** - Replicate the given document inclusive of all features

**Microsoft Excel**

**Week 19 - Excel Orientation :** The mentor needs to tell the importance of MS Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources

**Task 1 : Creating a Scheduler** - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text



**Week 20 - Task 2 : Calculating GPA** - Features to be covered:- Cell Referencing, Formulae in excel – average, std.deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, HLOOKUP/VLOOKUP

**Week 21 - Task 3 : Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

**Week 22 - Task 4 : Cricket Score Card** - Features to be covered:-Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation,

**Week 23 – Excel Module Test** - Replicate the given document inclusive of all features

### LaTeX and Microsoft Power Point

**Week 24 - Task1** : Students will be working on basic power point utilities and tools which help them create basic power point presentation.

Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint.

**Week 25 - Task 2** : Second week helps students in making their presentations interactive.

Topic covered during this week includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

**Week 26 - Task 3** : Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation.

Topic covered during this week includes :- Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide sorter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

**Week 27 - Task 4** : Entire week concentrates on presentation part of LaTeX and Microsoft power point.

Topic covered during this week includes -Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing

**Week 28 - Task 5** : Power point test would be conducted. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

### Microsoft Publisher

**Week 29** : Help students in preparing their personal website using Microsoft publisher.

Topic covered during this week includes- Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

### REFERENCES :

1. Complex Information Technology course tool kit- Vikas Gupta, WILEY Dreamtech
2. The Complete Computer upgrade and repair book, 3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. All LaTeX and others related material is available at
  - (a) [www.sssolutions.in](http://www.sssolutions.in) and
  - (b) [www.sontisoftsolutions.org](http://www.sontisoftsolutions.org)

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II Year B.Tech. CSE - I Semester

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### (MA 05476) PROBABILITY & STATISTICS

#### UNIT-I

**Probability** : Sample space and events – Probability – The axioms of probability - Some elementary theorems - Conditional probability – Baye's theorem.

#### UNIT-II

Random variables – Discrete and continuous – Distribution – Distribution function.

#### UNIT-III

Distribution - Binomial, poisson and normal distribution – related properties.

#### UNIT-IV

**Sampling distribution** : Populations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences.

#### UNIT-V

**Estimation** : Point estimation – Interval estimation - Bayesian estimation.

#### UNIT-VI

Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests.

#### UNIT-VII

Tests of significance – Student's t-test, F-test,  $\chi^2$  test, Estimation of proportions.

#### UNIT-VIII

**Curve fitting** : The method of least squares – Inferences based on the least squares estimations - Curvilinear regression – multiple regressions – correlation for univariate and bivariate distributions.

#### TEXT BOOKS :

1. Probability and statistics for engineers:Erwin Miller And John E.Freund. Prentice-Hall of India / Pearson , Sixth edition.
2. Text book of Probability and Statistics by Dr. Shahnaz Bathul, V.G.S.Publishers 2003.

#### REFERENCES :

1. Probability, Statistics and Random Processes Dr.K.Murugesan & P.Gurusamy by Anuradha Agencies, Deepthi Publications.
2. Advanced Engineering Mathematics (Eighth edition), Erwin Keyszig, John Wiley and Sons (ASIA) Pvt. Ltd., 2001.
3. Probability and Statistics for Engineers: G.S.S.Bhishma Rao,sitech., Second edition 2005.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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II Year B.Tech. CSE - I Semester

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**(CS 05360) MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE****UNIT-I**

**Mathematical Logic :** Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

**UNIT-II**

**Predicates :** Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

**UNIT-III**

**Set Theory :** Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram, Functions: Inverse Function Comports of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application.

**UNIT-IV**

**Algebraic structures :** Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

**UNIT-V**

**Elementary Combinatorics:** Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion.

**UNIT-VI**

**Recurrence Relation :** Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

**UNIT-VII**

**Graph Theory :** Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

**UNIT-VIII**

Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

**TEXT BOOKS :**

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P. Grimaldi. Pearson Education
2. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar P., TMH

**REFERENCES :**

1. Discrete Mathematical Structures, Bernard Kolman, Roberty C. Busby, Sharn Cutler Ross, Pearson Education/PHI.
2. Mathematical Foundations of computer science Dr.D.S.Chandrasekhararaha Prism books Pvt Ltd.
3. Discrete Mathematics. Lovasz, Springer.
4. Discrete Mathematics for Computer science, Garry Haggard and others, Thomson.
5. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker Prentice Hall.

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**(CS 05007) ADVANCED DATA STRUCTURES****UNIT - I**

Different strategies for problem solving, need for OOP, Overview of OOP Principles-Encapsulation, Inheritance, Polymorphism. C++ class overview- class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

**UNIT - II**

**Polymorphism and Inheritance :** Function overloading, operator overloading, generic programming- function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes.

**UNIT - III**

Streams, libraries and error handling – Stream classes hierarchy, console i/o, formatted I/O, file streams and string streams, exception handling mechanism, Standard Template Library.

**UNIT - VI**

Algorithms, performance analysis-time complexity and space complexity. Review of basic data structures- the list ADT, stack ADT, implementation using template class in C++, queue ADT, implementation using template class, priority queues-definition, ADT, heaps, definition, insertion and deletion, application-heap sort, disjoint sets-disjoint set ADT, disjoint set operations, union and find algorithms.

**UNIT - V**

**Skip lists and Hashing :** Dictionaries, linear list representation, skip list representation, operations- insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

**UNIT - VI**

**Search trees (part I) :** Binary search trees, definition, ADT, implementation, operations Searching, insertion and deletion, Balanced search trees- AVL trees, definition, height of an AVL tree, representation, operations- insertion, deletion and searching.

**UNIT - VIII**

**Search trees (part II) :** Red –Black trees-representation, insertion, deletion, searching Splay trees- introduction, the splay operation, B-Trees-B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

**UNIT - VIII**

**Pattern matching and Tries :** Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix trees, Search engines-Inverted files.

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**(CS 05175) DIGITAL LOGIC DESIGN**

**TEXT BOOKS :**

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Orient Longman Pvt. Ltd.
2. Data structures and Algorithms in C++, Michael T. Goodrich, R.Tamassia and D.Mount, Wiley student edition, John Wiley and Sons.

**REFERENCES :**

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education Ltd., Second Edition.
2. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
3. C++ primer, 3rd edition, S.B.Lippman, Pearson education ltd.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
5. Data structures and algorithms in C++, 3<sup>rd</sup> Edition, Adam Drozdek, Thomson

**UNIT-I**

**BINARY SYSTEMS :** Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

**UNIT-II**

**BOOLEAN ALGEBRA AND LOGIC GATES :** Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operators, Digital logic gates, integrated circuits.

**UNIT-III**

**GATE – LEVEL MINIMIZATION :** The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level Implementations, Exclusive – Or function, Hardward Description language (HDL).

**UNIT - IV**

**COMBINATIONAL LOGIC :** Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

**UNIT - V**

**SYNCHRONOUS SEQUENTIAL LOGIC :** Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

**UNIT - VI**

Registers, shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.

**UNIT - VII**

Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.

**UNIT -VIII**

**ASYNCHRONOUS SEQUENTIAL LOGIC :** Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

**TEXT BOOKS :**

1. DIGITAL DESIGN – Third Edition , M.Morris Mano, Pearson Education/PHI.
2. FUNDAMENTALS OF LOGIC DESIGN, Roth,5<sup>th</sup> Edition, Thomson.

**REFERENCES :**

1. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V.S. Rao, Pearson Education
3. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition.
4. Fundamentals of Digital Logic & Micro Computer Design, 5<sup>th</sup> Edition, M. Rafiqzaman John Wiley

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**(CS 05140) COMPUTER ORGANIZATION**

**UNIT-I**

**BASIC STRUCTURE OF COMPUTERS :** Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

**UNIT-II**

**REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS :** Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Microoperations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes: Computer Registers Computer Instructions – Instruction cycle.

**Memory –** Reference Instructions. Input – Output and Interrupt. **STACK** organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

**UNIT-III**

**MICRO PROGRAMMED CONTROL :** Control memory, Address sequencing, microprogram example, design of control unit Hardwired control; Microprogrammed control

**UNIT-IV**

**COMPUTER ARITHMETIC :** Addition and subtraction, multiplication Algorithms. Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

**UNIT-V**

**THE MEMORY SYSTEM :** Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID.

**UNIT-VI**

**INPUT-OUTPUT ORGANIZATION :** Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access. Input –Output Processor (IOP) Serial communication: Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

**UNIT-VII**

**PIPELINE AND VECTOR PROCESSING:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

**UNIT-VIII**

**MULTI PROCESSORS :** Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, InterProcessor Communication and Synchronization Cache Coherence. Shared Memory Multiprocessors.

**TEXT BOOKS :**

1. Computer Systems Architecture – M.Morris Mano, 11rd Edition, Pearson/PHI
2. Computer Organization – Car Hamacher, Zvonks Vranesic, Safezaky, Vih Edition, McGraw Hill.

**REFERENCES :**

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4<sup>th</sup> Edition PHI/Pearson
3. Fundamentals of Computer Organization and Design, -Sivaraama Dandamudi Springer Int. Edition.
4. Computer Organization, Anjaneysulu, Himalaya Pub house.

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**(CS 05159) DATA BASE MANAGEMENT SYSTEMS**

**UNIT - I**

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems: Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

**UNIT - II**

**Relational Model :** Introduction to the Relational Model – Integrity Constraint Overrelations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

**Relational Algebra and Calculus :** Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

**UNIT - III**

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregate Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOTR – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

**UNIT - IV**

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless Join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.

**UNIT - V**

**Overview of Transaction Management :** ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

**UNIT - VI**

**Concurrency Control :** Serializability, and recoverability – Introduction to Lock Management – Lock Conversions – Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking. **Crash recovery :** Introduction to ARIES – the Log – Other Recovery related Structures – the Write-Ahead Log Protocol – Check pointing – recovering from a System Crash – Media recovery – Other approaches and Interaction with Concurrency control.

**UNIT – VIII****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

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**UNIT – VIII****Storing data: Disks and Files :** The Memory Hierarchy – Redundant Arrays of Independent – Disks –

Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.

**Tree Structured Indexing :** Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.**Hash Based Indexing :** Static Hashing – Extendable hashing – Linear Hashing – Extendible vs. Linear hashing.**TEXT BOOKS :**

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3<sup>rd</sup> Edition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, IV edition.

**REFERENCES :**

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Database Systems design, Implementation, and Management, Rob & Coronel 5<sup>th</sup> Edition, Thomson
3. Data base Management System, Elmasri Navrate Pearson Education
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education.

**(CS 05008) ADVANCED DATA STRUCTURES (C++) LAB**

1. Write C++ programs to implement the following using an array.
  - a) Stack ADT
  - b) Queue ADT
2. Write C++ programs to implement the following using a singly linked list.
  - a) Stack ADT
  - b) Queue ADT
3. Write C++ program to implement the deque (double ended queue) ADT using a doubly linked list.
4. Write a C++ program to perform the following operations :
  - a) Insert an element into a binary search tree.
  - b) Delete an element from a binary search tree.
  - c) Search for a key element in a binary search tree.
5. Write a C++ program to implement circular queue ADT using an array.
6. Write C++ programs that use non-recursive functions to traverse the given binary tree in
  - a) Preorder
  - b) inorder and
  - c) postorder.
7. Write a C++ programs for the implementation of bfs and dfs for a given graph.
8. Write C++ programs for implementing the following sorting methods :
  - a) Quick sort
  - b) Merge sort
  - c) Heap sort
9. Write a C++ program to perform the following operations
  - a) Insertion into a B-tree
  - b) Deletion from a B-tree
10. Write a C++ program to perform the following operations
  - a) Insertion into an AVL-tree
  - b) Deletion from an AVL-tree
11. Write a C++ program to implement Kruskal's algorithm to generate a minimum spanning tree.
12. Write a C++ program for implementing Knuth-Morris pattern matching algorithm.
 

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

**(Note :** Use class templates in all the above programs)



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**(CS 05157) DATABASE MANAGEMENT SYSTEMS LAB**

1. Creating tables for various relations (in SQL)
2. Implementing the queries in SQL for
  - a) Insertion
  - b) Retrieval (Implement all the operation like Union, Intersect, Minus, In, exist, aggregate functions (Min, Max...) etc...
  - c) Updation
  - d) Deletion
3. Creating Views
4. Writing Assertions
5. Writing Triggers
6. Implementing Operations on relations (tables) using PL/SQL
7. Creating FORMS
8. Generating REPORTS.

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**(CS 05521) SOFTWARE ENGINEERING**

- UNIT-I : Introduction to Software Engineering :** The evolving role of software, Changing Nature of Software, Software myths.
- A Generic view of process :** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMM/II), Process patterns, process assessment, personal and team process models.
- UNIT-II : Process models :** The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
- Software Requirements :** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.
- UNIT-III : Requirements engineering process :** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.
- System models :** Context Models, Behavioral models, Data models, Object models, structured methods.
- UNIT-IV : Design Engineering :** Design process and Design quality, Design concepts, the design model.
- Creating an architectural design :** Software architecture, Data design, Architectural styles and patterns, Architectural Design.
- UNIT-V : Object-Oriented Design :** Objects and object classes, An Object-Oriented design process, Design evolution.
- Performing User interface design :** Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.
- UNIT-VI : Testing Strategies :** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
- Product metrics :** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.
- UNIT-VII : Metrics for Process and Products :** Software Measurement, Metrics for software quality.
- Risk management :** Reactive vs Proactive Risk strategies, software risks, Risk Identification, Risk projection, Risk refinement, RMM/MI, RMM/MI Plan.
- UNIT-VIII : Quality Management :** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.
- TEXT BOOKS :**
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6<sup>th</sup> edition, McGrawHill International Edition.
  2. Software Engineering- Sommerville, 7<sup>th</sup> edition, Pearson education.
- REFERENCES :**
1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
  2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
  3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
  4. Software Engineering principles and practice- Waman S.Jawadekar, The McGraw-Hill Companies.

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**(CS 05160) DESIGN AND ANALYSIS OF ALGORITHMS****UNIT-I**

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big Oh notation, Omega notation, Theta notation and Little Oh notation, Probabilistic analysis, Amortized analysis.

**UNIT-II**

Divide and conquer: General method ,applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

**UNIT-III**

Greedy method: General method ,applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**UNIT-IV**

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

**UNIT-V**

Searching and Traversal Techniques: Efficient non recursive binary traversal algorithms, Graph traversal- Breadth first search and Depth first search, AND/OR graphs, game tree, Bi-connected components.

**UNIT-VI**

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**UNIT-VII**

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

**UNIT-VIII**

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP-Complete classes, Cook's theorem.

**TEXT BOOKS :**

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and S.Rajasekharam, Galgotia publications Pvt. Ltd.

2. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leterson, R.L.Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.

**REFERENCES :**

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.

2. Introduction to Design and Analysis of Algorithms A strategic approach, R. C. T. Lee, S. S. Tseng, R. C. Chang and T. Tsai, Mc Graw Hill.

3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.

4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Educalin

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**(CE 05239) ENVIRONMENTAL STUDIES****UNIT - I**

**Multidisciplinary nature of Environmental Studies:** Definition, Scope and Importance – Need for Public Awareness.

**UNIT - II**

**Natural Resources :** Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

**UNIT - III**

**Ecosystems :** Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem. - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

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

**UNIT - IV**

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

**UNIT - V**

**Environmental Pollution :** Definition, Cause, effects and control measures of :



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## (EC 05471) PRINCIPLES OF COMMUNICATIONS

## UNIT-I

**Introduction :** Block diagram of Electrical communication system, Radio communication : Types of communications, Analog, pulse, and digital, Types of signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Autocorrelation, correlation, convolution.

## UNIT-II

**Amplitude Modulation :** Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM : Diode detector, Product demodulation for DSB SC & SSB SC.

## UNIT-III

**Angle Modulation :** Frequency & Phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

## UNIT-IV

**Pulse Modulations :** Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Division Multiplexing, Frequency Division Multiplexing, Asynchronous Multiplexing.

## UNIT-V

**Digital Communication :** Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

## UNIT-VI

**Digital Modulation :** ASK, FSK, PSK, DPSK, QPSK demodulation, coherent and incoherent reception, Modems.

## UNIT-VII

**Information Theory :** Concept of information, rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shannon-Fano and Huffman coding.

## UNIT-VIII

**Error control coding :** Introduction, Error detection and correction codes, block codes, convolution codes.

## TEXT BOOKS :

1. Communication Systems Analog and Digital – R.P. Singh, SD Sapre, TMH, 20<sup>th</sup> reprint, 2004.
2. Principle of Communications, Taub & Schilling, TMH, 2003.

## REFERENCES :

1. Electronic Communication Systems – Kennedy & Davis, TMH, 4<sup>th</sup> edition, 2004.
2. Communication Systems Engineering – John. G. Proakis, Masoud and Salehi, 2<sup>nd</sup> Ed. PHI/ Pearson.

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

**Solid waste Management :** Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

## UNIT - VI

**Social Issues and the Environment :** From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people: Its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

## UNIT - VII

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

## UNIT - VIII

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

## TEXTBOOK :

Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

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**(EC 05400) MICROPROCESSORS AND INTERFACING****UNIT-I**

An overview of 8085, Architecture of 8086 Microprocessor. Special functions of General purpose registers, 8086 flag register and function of 8086 Flags.

**UNIT-II**

Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures, and macros.

**UNIT-III**

Assembly language programs involving logical Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

**UNIT-IV**

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257.

**UNIT-V**

8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, Stepper Motor and actuators. D/A and A/D converter interfacing.

**UNIT-VI**

Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and Interfacing cascading of interrupt controller and its importance.

**UNIT-VII**

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.

**UNIT-VIII**

8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

**TEXT BOOKS :**

1. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi. TMH, 2000.
2. Microprocessors and interfacing - Douglas V. Hall, TMH, 2<sup>nd</sup> Edition, 1999.

**REFERENCES :**

1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design - Y.Liu and G.A. Gibson, PHI, 2<sup>nd</sup> edition.
2. Microprocessors 8086/8088 - Avatar Singh and Triebel, PHI.
3. Assembly Language Techniques for the IBM PC - Alan R. Miller, BPB (for DOS and BIOS interrupts only)
4. Micro Controllers - Rajkamal, Pearson Education, 2005.
5. Design with PIC Micro Controllers – John B. Peatman, 2005.
6. 8051 Micro Controllers and Embedded Systems – Dr. Rajiv Kapadia, Jaico Publishers.
7. 8086 Micro Processor - Kenneth J. Ayala, Penram International/ Thomson, 1995.
8. 8051 Microcontroller - Kenneth J. Ayala, Penram International/ Thomson, 3<sup>rd</sup> Edition, 2005.

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**(CS 05434) OOPS THROUGH JAVA****UNIT-I**

**Introduction :** Creation of Java, importance of Java to internet, byte code, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, type conversion and casting, compiling and running of simple Java program.

**UNIT-II**

**Classes and Objects :** Concepts of classes and objects, class fundamentals. Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion, nested classes and inner classes, exploring the String class.

**UNIT-III**

**Inheritance :** Basic concepts, member access rules, usage of super keyword, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class.

**UNIT-IV**

**Packages and Interfaces :** Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

**UNIT-V**

**Exception Handling and Multithreading :** Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

**UNIT-VI**

**Event Handling :** Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

**AWT :** Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics.

**UNIT-VII**

**AWT Controls :** Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border, Grid, Card and Gridbag.

**Swing** – JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbbed Panes, Scroll Panes, Trees, and T Tables.

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

#### UNIT-VIII

**Networking and Java Library** : Basics of Networking, InetAddress, TCP/IP sockets, Datalograms, URL, URL connection, String handling, java.util, java.io and java.net packages.

#### TEXT BOOKS :

1. The Complete Reference Java J2SE 5<sup>th</sup> Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.
2. Big Java 2<sup>nd</sup> Edition, Cay Horstmann, John Wiley and Sons.

#### REFERENCES :

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. Beginning in Java 2, Iver Horton, Wrox Publications.
5. Java, Somasundaram, Jaico.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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II Year B. Tech. CSE - II Semester

(CS 05338) JAVA LAB

T	P	C
0	3	2

1. Write a Java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a, b, c and use the quadratic formula. If the discriminant  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.
2. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that Integer.
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program to multiply two given matrices.
7. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers. (use string to kenrizer class)
8. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
9. Write a Java program that reads a file and displays a file and displays the file on the screen, with a line number before each line.
10. Write a Java program that displays the number of characters, lines and words in a text file.
11. Write a Java program that:
  - a) Implements stack ADT.
  - b) Converts infix expression into Postfix form.
12. Write an applet that displays a simple message.
13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; If true, the interest rate is per month; Other wise the interest rate is annual.
14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
15. Write a Java program for handling mouse events.
16. Write a Java program for creating multiple threads
17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
18. Write a Java program that lets users create Pie charts. Design your own user interface (with swings & AWT)
19. Write a Java program that allows the user to draw lines, rectangles and Ovals.
20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.
21. Write a Java program that illustrates how run time polymorphism is achieved.

II Year B.Tech. CSE - II Semester	T	P	C
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**(EC 05401) MICROPROCESSORS LAB****I. Microprocessor 8086 :**

1. Introduction to MASM/TASM.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

**II. Interfacing :**

1. 8259 – Interrupt Controller : Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display : Write a small program to display a string of characters.
3. 8255 – PPI : Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART : Write a program in ALP to establish Communication between two processors.

**III. Microcontroller 8051 :**

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

III Year B.Tech. CSE - I Semester	T	P	C
	4+1	0	4

**(CS 05263) FORMAL LANGUAGES AND AUTOMATA THEORY**

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

**UNIT - I**

**Fundamentals :** Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

**UNIT - II**

**Finite Automata :** NFA with  $\lambda$  transitions - Significance, acceptance of languages, Conversions and Equivalence : Equivalence between NFA with and without  $\lambda$  transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Mealy machines.

**UNIT - III**

**Regular Languages :** Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions, Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

**UNIT - IV**

**Grammar Formalism :** Regular grammars- right linear and left linear grammars, equivalence between regular linear grammar and FA, Inter conversion, Context free grammar, derivation trees, sentential forms, Right most and leftmost derivation of strings,

**UNIT - V**

**Context Free Grammars :** Ambiguity in context free grammars, Minimisation of Context Free Grammars, Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL (proofs omitted).

**UNIT - VI**

**Push Down Automata :** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence, Equivalence of CFL and PDA, Interconversion. (Proofs not required). Introduction to DCFE and DPDA.

**UNIT - VII**

**Turing Machine :** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages, Church's hypothesis, counter machine, types of Turing machines (proofs not required).

**UNIT VIII**

**Computability Theory :** Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posis. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

**TEXT BOOKS :**

1. "Introduction to Automata Theory Languages and Computation", Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.

**REFERENCES :**

1. Introduction to languages and the Theory of Computation, John C.Martin, TMH
2. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
3. Theory of Computer Science – Automata languages and computation -Misra and Chandrashekaran, 2<sup>nd</sup> edition, PHI
4. Introduction to Theory of Computation – Sipser 2<sup>nd</sup> edition Thomson

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III Year B.Tech. CSE - I Semester

T	P	C
4+1	0	4

**(CS 05432) OBJECT ORIENTED ANALYSIS AND DESIGN****UNIT - I**

**Introduction to UML :** Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

**UNIT - II**

**Basic Structural Modeling :** Classes, Relationships, common Mechanisms, and diagrams.

**Advanced Structural Modeling :** Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

**UNIT - III**

**Class & Object Diagrams :** Terms, concepts, modeling techniques for Class & Object Diagrams.

**UNIT - IV**

**Basic Behavioral Modeling-I :** Interactions, Interaction diagrams.

**UNIT - V**

**Basic Behavioral Modeling-II :** Use cases, Use case Diagrams, Activity Diagrams.

**UNIT - VI**

**Advanced Behavioral Modeling :** Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

**UNIT-VIII**

**Architectural Modeling :** Component, Deployment, Component diagrams and Deployment diagrams.

**UNIT - VIII**

**Case Study :** The Unified Library application.

**TEXT BOOKS :**

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Faddo: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

**REFERENCE BOOKS:**

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
3. Atul Kahate: Object Oriented Analysis & Design. The McGraw-Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML, TATA McGrawHill
5. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.



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III Year B.Tech. CSE - I Semester

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**(HS 05353) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

**UNIT - I**

**Introduction to Managerial Economics :** Definition, Nature and Scope Managerial Economics- Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

**UNIT - II**

**Elasticity of Demand :** Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

**UNIT - III**

**Theory of Production and Cost Analysis :** Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale.

**Cost Analysis :** Cost concepts, Opportunity cost, Fixed Vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

**UNIT IV**

**Introduction to Markets & Pricing strategies**

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies

**UNIT V**

**Business & New Economic Environment :** Characteristic features of Business. Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario

**UNIT VI**

**Capital and Capital Budgeting :** Capital and its significance. Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

**UNIT VII**

**Introduction to Financial Accounting :** Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments),

**UNIT VIII**

**Financial Analysis through ratios :** Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

**TEXT BOOKS :**

1. Aiyasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

**REFERENCES :**

1. Ambish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2004.
2. Shim & Siegel: Financial Accounting (Schaum's Outlines), 2/e, TMH, 2004
3. Chary: Production and Operations Management, 3/e, TMH, 2004.
4. Dominick Salvatore: Managerial Economics In a Global Economy, 4<sup>th</sup> Edition, Thomson, 2003.
5. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI, 2005
6. Peterson & Lewis: Managerial Economics, 4<sup>th</sup> Edition, Pearson Education, 2004
7. Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Saitech, 2005.
8. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2005.
9. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2004.
10. Dwivedi: Managerial Economics, 6<sup>th</sup> Ed., Vikas, 2002
11. Yogesh Maheswari: Managerial Economics, 2<sup>nd</sup> Ed., PHI, 2005.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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III Year B.Tech. CSE - I Semester

T	P	C
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## (CS 05435) OPERATING SYSTEMS

## UNIT - I

**Computer System and Operating System Overview:** Overview of Computer System hardware – Instruction execution – I/O function – Interrupts – Memory hierarchy – I/O Communication techniques, Operating System Objectives and functions – Evaluation of operating System – Example Systems.

## UNIT - II

**Process Description** – Process Control –Process States- Process and Threads - Examples of Process description and Control.

## UNIT - III

**Concurrency** : Principles of Concurrency – Mutual Exclusion – Software and hardware approaches – semaphores – Monitors – Message Passing – Readers Writers Problem.

## UNIT - IV

**Principles of deadlock** – deadlock prevention, detection and avoidance dining philosophers problem – example Systems.

## UNIT - V

**Memory Management** : Memory Management requirements – loading programmes in to main memory – virtual memory – hardware and Control structures – OS Software – Examples of Memory Management.

## UNIT - VI

**Uniprocessor Scheduling** : Types of Scheduling – Scheduling algorithms – I/O management and Disc Scheduling – I/o devices – organization – of I/O function – OS design issues – I/O buffering – Disk I/O – disk scheduling Policies – examples System.

## UNIT - VII

**File Management and Security** : Overview of file management – file organization and access – File Directories – File sharing – record blocking – secondary Storage Management – example system.

## UNIT - VIII

**Security** : Security threats – Protection – intruders – Viruses – trusted System.

## TEXT BOOKS :

1. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
2. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7<sup>th</sup> Edition, John Wiley.

## REFERENCES :

1. Operating System A Design Approach-Crowley, TMH.
2. Modern Operating Systems, Andrew S Tanenbaum 2<sup>nd</sup> edition Pearson/PHI.

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## (CS 05138) COMPUTER NETWORKS

## UNIT - I

**Introduction** : OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks ,Arpanet, Internet, Network Topologies WAN, LAN, MAN.

## UNIT - II

**Physical Layer** : Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications: Narrow band, broad band/ISDN and ATM.

## UNIT - III

**Data link layer** : Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM.

## UNIT - IV

**Medium Access sub layer** : ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS, Bridges,

## UNIT - V

**Network Layer** : Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.

## UNIT - VI

Dynamic routing – Broadcast routing. Rotary for mobility. Congestion, Control Algorithms – General Principles – of Congestion prevention policies. Internet working: The Network layer in the internet and in the ATM Networks.

## UNIT -VII

**Transport Layer**: Transport Services, Connection management, TCP and UDP protocols, ATM AAL Layer Protocol.

## UNIT - VIII

**Application Layer** – Network Security, Domain name system, SNMP, Electronic Mail, the World WEB, Multi Media.

## TEXT BOOKS :

1. Computer Networks — Andrew S Tanenbaum, 4<sup>th</sup> Edition. Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan, Third Edition TMH.

## REFERENCES :

1. An Engineering Approach to Computer Networks-S.Keshav, 2<sup>nd</sup> Edition, Pearson Education
2. Understanding communications and Networks, 3<sup>rd</sup> Edition, W.A. Shay, Thomson



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III Year B.Tech. CSE - I Semester

T	P	C
4+1	0	4

**(CS 05475) PRINCIPLES OF PROGRAMMING LANGUAGES**

**UNIT-I**

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories. Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

**UNIT – II**

Syntax and Semantics: general Problem of describing Syntax and Semantics; formal methods of describing Syntax - BNF, EBNF for common programming languages features; parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

**UNIT-III**

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

**UNIT-IV**

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

**UNIT-V:**

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

**UNIT-VI**

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

**UNIT - VII**

**Exception handling :** Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

**Logic Programming Language :** Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

**UNIT - VIII**

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

**TEXT BOOKS :**

1. Concepts of Programming Languages Robert .W. Sebesta 6/e, Pearson Education.
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PH/ Pearson Education.

**REFERENCES :**

1. Programming languages –Chezzi, 3/e, John Wiley
2. Programming Languages –Louden, Second Edition, Thomson.
3. Programming languages –Watt, Wiley Dreamtech
4. LISP Patric Henry Winston And Paul Horn Pearson Education.
5. Programming In PROLOG Clocksin, Springer

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III Year B.Tech. CSE - I Semester

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0	3	2

**(CS 05564) UML LAB**

1. The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.
2. Student has to take up another case study of his/her own interest and do the same what ever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned in theory syllabus can be referred for some idea.

**Note :** The analysis, design, coding, documentation, database design of mini project which will be carried out in 4<sup>th</sup> year should be done in object-oriented approach using UML and by using appropriate software which supports UML, otherwise the mini project will not be evaluated.

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III Year B.Tech. CSE - I Semester

T	P	C
0	3	2

**(CS 05139) COMPUTER NETWORKS AND OPERATING SYSTEMS LAB**

- Part - A**
1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
  2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP .
  3. Implement Dijkstra 's algorithm to compute the Shortest path thru a graph.
  4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
  5. Take an example subnet of hosts . Obtain broadcast tree for it.
  6. Take a 64 bit playing text and encrypt the same using DES algorithm .
  7. Write a program to break the above DES coding
  8. Using RSA algorithm Encrypt a text data and Decrypt the same .

- Part - B**
1. Simulate the following CPU scheduling algorithms
    - a) Round Robin b) SJF c) FCFS d) Priority
  2. Simulate all file allocation strategies
    - a) Sequential b) Indexed c) Linked
  3. Simulate MVT and MFT
  4. Simulate all File Organization Techniques
    - a) Single level directory b) Two level c) Hierarchical d) DAG
  5. Simulate Bankers Algorithm for Dead Lock Avoidance
  6. Simulate Bankers Algorithm for Dead Lock Prevention
  7. Simulate all page replacement algorithms
    - a) FIFO b) LRU c) LFU Etc. ...
  8. Simulate Paging Technique of memory management.

III Year B.Tech. CSE - II Semester	T	P	C
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**(CS 05137) COMPUTER GRAPHICS****UNIT - I**

Introduction, Application areas of Computer Graphics; overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices (p.nos 22-90 of text book-1).

**UNIT - II**

**Output primitives :** Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms, Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137-145, 147-150, 164-171 of text book-1, p.nos: 72-99 of text book-2).

**UNIT - III**

**2-D geometrical transforms :** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

**UNIT - IV**

**2-D viewing :** The viewing pipeline, viewing coordinate/reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland-Hodgeman polygon clipping algorithm(p.nos 237-249,257-261 of textbook -1, p.nos: 111-126 of textbook-2).

**UNIT - V**

**3-D object representation :** Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces, Basic illumination models, polygon rendering methods. (p.nos 324-331,340-342, 347-364, 516-531, 542-546 of text book-1, p.nos 473-529,721-739 of text book-2).

**UNIT - VI**

**3-D Geometric transformations :** Translation, rotation, scaling, reflection and shear transformations, composite transformations.

**3-D viewing :** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

**UNIT-VII**

**Visible surface detection methods :** Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods(p.nos 489-505 of text book -1, Chapter 15 of text book-2).

**UNIT-VIII**

**Computer animation :** Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key/frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of text book-2).

**TEXT BOOKS :**

1. "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson Education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

**REFERENCES :**

1. "Computer Graphics", second Edition, Donald Hearn and M. Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigang Xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2<sup>nd</sup> edition.
4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

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III Year B.Tech. CSE - II Semester

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**(CS 05130) COMPILER DESIGN****UNIT - I**

**Overview of Compilation :** Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

**UNIT - II**

**Top down Parsing :** Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

**UNIT - III**

**Bottom up parsing :** Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

**UNIT - IV**

**Semantic analysis :** Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes, Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

**UNIT - V**

**Symbol Tables :** Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation; static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

**UNIT - VI**

**Code optimization :** Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

**UNIT - VII**

**Data flow analysis :** Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

**UNIT - VIII**

**Object code generation :** Object code forms, machine dependent code optimization, register allocation and assignment, generic code generation algorithms, DAG for register allocation.

**TEXT BOOKS :**

1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

**REFERENCES :**

1. lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. Bal, Catriel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler-Cooper & Linda, Elsevier.
4. Compiler Construction, Louden, Thomson.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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**(CS 05566) UNIX PROGRAMMING****UNIT - I**

**Unix utilities -1 :** Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

**UNIT - II**

**Unix utilities -2:** Text processing utilities and backup utilities, detailed commands to be covered are cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

**UNIT - III**

**Problem solving approaches in Unix :** Using single commands, using compound. Commands, shell scripts, C programs, building own command library of programs.

**UNIT - IV**

**Working with the Bourne shell :** What is a shell, shell responsibilities, pipes and input Redirection, output redirection, here documents, the shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

**UNIT - V**

**Unix Internals - 1 :** Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, ioctl, unmask, dup and dup2, the standard i/o (fopen, fopen, fclose, fflush, fseek, ftell, getc, getc, getc, putchar, fgets, gets), formatted I/O, stream errors, streams and file descriptors, file and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, mdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir, rewinddir, seekdir, telldir).

**UNIT - VI**

**Unix Internals - 2 :** Process and Signals : What is process, process structure, starting new process, Waiting for a process, zombie process, process control, process identifiers, fork, York, exit, wait, exec, Signal functions, unreliable signals, interrupted system Calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

**UNIT - VII**

**Unix Internals - 3 :** Data Management : Management of memory (malloc, free, realloc, calloc), File Locking (creating lock files, Locking regions, use of read/write locking, competing locks, other commands, deadlocks)

**UNIT - VIII**

**Unix Internals - 4 :** Inter-Process communication : Pipe, Process Pipes, the pipe call, parent-child process, named pipes : FIFOs, Semaphores, message queues and shared memory and applications of IPC.

**TEXT BOOKS :**

1. Unix the ultimate guide, Sumitabha Das, TMH.
2. Unix Network Programming, W. R. Stevens Pearson/PHI.

**REFERENCES :**

1. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.
2. Unix system programming using C++, T. Chan, PHI.
3. Unix programming environment, Kernighan and Pike, PHI / Pearson Education
4. Unix Internals The New Frontiers, U. Vahalla, Pearson Education.
5. Unix for programmers and users, 3<sup>rd</sup> edition, Graham Glass, King Ables, Pearson Education.

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**(CS 05317) INFORMATION SECURITY**

**UNIT - I**

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

**UNIT - II**

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

**UNIT - III**

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

**UNIT - IV**

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

**UNIT - V**

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**UNIT - VI**

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

**UNIT - VIII**

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

Intruders, Viruses and related threats.

**UNIT - VIII**

Firewall Design principles, Trusted Systems.

Intrusion Detection Systems.

**TEXT BOOKS :**

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuk and Ryan Perneh, wiley Dreamtech,

**REFERENCES :**

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.

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**(CS 05424) NEURAL NETWORKS**

**UNIT - I**

**INTRODUCTION** - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks (p. no's 1 -49)

**UNIT - II**

**LEARNING PROCESS** – Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process, (p. no's 50 –116)

**UNIT - III**

**SINGLE LAYER PERCEPTRONS** – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment (p. no's 117 –155)

**UNIT - IV**

**MULTILAYER PERCEPTRON** – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, (p. no's 156 –201)

**UNIT - V**

**BACK PROPAGATION** - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning; (p. no's 202 –234)

**UNIT - VI**

**SELF ORGANIZATION MAPS** – Two basic feature mapping models; Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive pattern classification, (p. no's. 443 –469, 9,1 –9,8)

**UNIT - VIII**

**NEURO DYNAMICS** – Dynamical systems, stability of equilibrium states, attractors, neurodynamical models, manipulation of attractors as a recurrent network paradigm (p. no's 664 –680, 14,1 –14,6)

**UNIT - VIII**

**HOPFIELD MODELS** – Hopfield models, computer experiment I. (p. no's. 680 - 701, 14,7 –14,8)

**TEXT BOOK :**

1. Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2<sup>nd</sup> edition 2004

**REFERENCES :**

1. Artificial neural networks - B. Vegnanarayana Prentice Hall of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura pearson education 2004



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**(CS 05523) SOFTWARE TESTING METHODOLOGIES**

**UNIT - I**

**Introduction :** Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

**UNIT - II**

**Flow graphs and Path testing :** Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

**UNIT - III**

**Transaction Flow Testing :** Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

**UNIT - IV**

**Domain Testing:-** domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

**UNIT - V**

**Paths, Path products and Regular expressions :** Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

**UNIT - VI**

**Logic Based Testing :** Overview, decision tables, path expressions, kv charts, specifications.

**UNIT - VII**

**State, State Graphs and Transition testing :** State graphs, good & bad state graphs, state testing, Testability tips.

**UNIT - VIII**

**Graph Matrices and Application :** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

**TEXT BOOKS :**

1. Software Testing techniques - Boris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

**REFERENCES :**

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing In the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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**(CS 05318) INFORMATION SECURITY LAB**

1. Working with Sniffers for monitoring network communication (Ethereal)

2. Understanding of cryptographic algorithms and implementation of the same in C or C++

3. Using openssl for web server - browser communication

4. Using GNU PGP

5. Performance evaluation of various cryptographic algorithms

6. Using IPTABLES on Linux and setting the filtering rules

7. Configuring S/MIME for e-mail communication

8. Understanding the buffer overflow and format string attacks

9. Using NMAP for ports monitoring

10. Implementation of proxy based security protocols in C or C++ with features like confidentiality, integrity and authentication

**Following are some of the web links, which help to solve the above assignments :**

- [http://linuxcommand.org/man\\_pages/openssl1.html](http://linuxcommand.org/man_pages/openssl1.html)
- <http://www.openssl.org/docs/apps/openssl.html>
- <http://www.queen.clara.net/pgp/art3.html>
- <http://www.ccs.ornl.gov/~hongov/main/resources/contibgpg-howto/gpg-howto.html>
- <https://nefiles.ulic.edu/ehowes/www/gpg/gpg-com-0.htm>
- <http://www.ethereal.com/docs/user-guide/>

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**(CS 05567) UNIX Programming and Compiler Design Lab**

**PART - A**

1. Write a shell script to generate a multiplication table.
2. Write a shell script that copies multiple files to a directory.
3. Write a shell script which counts the number of lines and words present in a given file.
4. Write a shell script which displays the list of all files in the given directory.
5. Write a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns remainder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add(-a), subtract(-s), multiply(-m), quotient(-c) and remainder(-r).
6. Write a shell script to reverse the rows and columns of a matrix.
7. Write a C program that counts the number of blanks in a text file.
  - a) using standard I/O
  - b) using system calls.
8. Implement in C the following Unix commands using system calls.
  - a) cat
  - b) ls
  - c) mv
  - d) Number of links.
  - e) File type.
  - f) Read, Write and Execute permissions.
9. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:
  - a) Time of last access.
  - b) Read, Write and Execute permissions.
10. Write a C program that illustrates how to execute two commands concurrently with a command pipe.
11. Write a C program that illustrates the creation of child process using fork system call.
12. Write a C program that displays the real time of a day every 60 seconds.
13. Write a C program that illustrates file locking using semaphores.
14. Write a C program that implements a producer-consumer system with two processes. (using semaphores)
15. Write a C program that illustrates inter process communication using shared memory system calls.
16. Write a C program that illustrates the following.
  - a) Creating a message queue.
  - b) Writing to a message queue.
  - c) Reading from a message queue.

**PART - B**

**Objective :** To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar:

```

<program> ::= <block>
<block> ::= { <variabledefinition> <stmt> }
          | { <stmt> }
<variabledefinition> ::= int <vardeflist> ;
<vardeflist> ::= <vardec> | <vardec> , <vardeflist>
<vardec> ::= <identifier> | <identifier> [ <constant> ]
<stmt> ::= <statement> | <statement> ; <stmt>
<statement> ::= <assignment> | <ifstatement> | <whilestatement>
          | <block> | <printstatement> | <empty>
<assignment> ::= <identifier> = <expression>
          | <identifier> [ <expression> ] = <expression>
<ifstatement> ::= if <bexpression> then <stmt> else <stmt> endif
          | if <bexpression> then <stmt> endif
<whilestatement> ::= while <bexpression> do <stmt> enddo
<printstatement> ::= print ( <expression> )
<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <reltop> <expression>
<reltop> ::= < | <= | == | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [ <expression> ]
          | ( <expression> )
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= <letter> | <digit>
<letter> ::= a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z
<digit> ::= 0|1|2|3|4|5|6|7|8|9
<empty> has the obvious meaning

```

Comments (Zero or more characters enclosed between the standard C/Java-style comment brackets / \* ... \*/) can be inserted. The language has rudimentary support for 1-dimensional arrays. The declaration int a[3] declares an array of three elements, referenced as a[0], a[1] and a[2]. Note also that you should worry about the scoping of names.

A simple program written in this language is:

```

int a[3], t1, t2;
t1 = 2;
a[0] = 1; a[1] = 2; a[2] = 3;
t2 = (a[2] + t1 * 6) / (a[2] - t1);

```



```

if t2>5 then
print(t2);
else {
int t3;
t3=99;
t2=-25;
print(-t1+t2*t3); /* this is a comment
on 2 lines */
} endif }

```

1. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical analyzer using Lex, flex or lex or other lexical analyzer generating tools.
3. Design Predictive parser for the given language
4. Design LALR bottom up parser for the above language.
5. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.
6. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code:

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below. In the description of the individual instructions below, instruction argument types are specified as follows :

**R** specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc.).

**L** specifies a numerical label (in the range 1 to 9999).

**V** specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

**A** specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register. So, for example, an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

**LOAD A,R**

loads the integer value specified by A into register R.

**STORE R,V**

stores the value in register R to variable V.

**OUT R**

outputs the value in register R.

**NEG R**

negates the value in register R.

**ADD A,R**

adds the value specified by A to register R, leaving the result in register R.

**SUB A,R**

subtracts the value specified by A from register R, leaving the result in register R.

**MUL A,R**

multiplies the value specified by A by register R, leaving the result in register R.

**DIV A,R**

divides register R by the value specified by A, leaving the result in register R.

**JMP L**

causes an unconditional jump to the instruction with the label L.

**JEQ R,L**

jumps to the instruction with the label L if the value in register R is zero.

**JNE R,L**

jumps to the instruction with the label L if the value in register R is not zero.

**JGE R,L**

jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

**JGT R,L**

jumps to the instruction with the label L if the value in register R is greater than zero.

**JLE R,L**

jumps to the instruction with the label L if the value in register R is less than or equal to zero.

**JLT R,L**

jumps to the instruction with the label L if the value in register R is less than zero.

**NOP**

is an instruction with no effect. It can be tagged by a label.

**STOP**

stops execution of the machine. All programs should terminate by executing a STOP instruction.

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**(CS 05216) EMBEDDED SYSTEMS****Unit - I**

**Embedded Computing :** Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. **(Chapter 1 from Text Book 1, Wolf).**

**Unit - II**

**The 8051 Architecture :** Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. **(Chapter 3 from Text Book 2, Ayala).**

**Unit - III**

**Basic Assembly Language Programming Concepts :** The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. **(Chapters 4,5 and 6 from Text Book 2, Ayala).**

**Unit - IV**

Arithmetic Operations, Decimal Arithmetic, Jump and Call Instructions, Further Details on Interrupts. **(Chapter 7 and 8 from Text Book 2, Ayala)**

**Unit - V**

**Applications :** Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. **(Chapter 10 and 11 from Text Book 2, Ayala).**

**Unit - VI**

**Introduction to Real – Time Operating Systems :** Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. **(Chapter 6 and 7 from Text Book 3, Simon).**

**Unit - VII**

**Basic Design Using a Real-Time Operating System :** Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools; Host and Target machines; Linker/Locators for Embedded Software; Getting Embedded Software into the Target System; Debugging Techniques; Testing on Host Machine, Using Laboratory Tools, An Example System. **(Chapter 8, 9, 10 & 11 from Text Book 3, Simon).**

**Unit - VIII**

**Introduction to advanced architectures :** ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I<sup>2</sup>C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. **(Chapter 8 from Text Book 1, Wolf).**

**TEXT BOOKS :**

1. Computers and Components, Wayne Wolf, Elsevier.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

**REFERENCES :**

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukh, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj Kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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**(CS 05579) WEB TECHNOLOGIES**

**UNIT - I :** HTML Common tags - List, Tables, images, forms, Frames; Cascading Style sheets.

**UNIT - II :** Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

**UNIT - III : XML :** Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

**UNIT - IV : Java Beans :** Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties

Persistence, Customizes, Java Beans API, Introduction to EJBs.

**UNIT - V : Web Servers :** Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

**UNIT - VI : Introduction to JSP :** The Problem with Servlet, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

**UNIT - VII : JSP Application Development :** Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations.

**UNIT - VIII : Database Access :** Database Programming using JDBC, Studying Javax.sql.\* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

**TEXT BOOKS :**

1. Web Programming, building internet applications, Chris Bates 2<sup>nd</sup> edition, WILEY Dreamtech (UNITs 1,2,3).
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 19, 20, 21, 22, 25, 27) (UNIT 4).

**REFERENCES :**

1. Internet and World Wide Web – How to program by Dietel and Nieto PHH/Pearson Education Asia.
2. Jakarta Struts Cookbook Bill Siggekow, S P D O'Reilly for chap 8.
3. Murach's beginning JAVA JDK 5, Murach, SPD
4. An Introduction to web Design and Programming –Wang-Thomson
5. Web Applications Technologies Concepts-Knuckles, John Wiley
6. Programming world wide web-Sebesta, Pearson
7. Building Web Applications-NIIT, PHI
8. Web Warrior Guide to Web Programming-BallekKedaw-Thomas
9. Beginning Web Programming-Jon Duckett WROX.
10. Java Server Pages, Pekowsky, Pearson.
11. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8).

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**(CS 05158) DATA WAREHOUSING AND DATA MINING****UNIT - I**

**Introduction :** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

**UNIT - II**

**Data Preprocessing :** Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

**UNIT - III**

**Data Mining Primitives, Languages, and System Architectures :** Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems,

**UNIT - IV**

**Concepts Description : Characterization and Comparison :** Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures In Large Databases.

**UNIT - V**

**Mining Association Rules In Large Databases :** Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

**UNIT - VI**

**Classification and Prediction :** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

**UNIT - VII**

**Cluster Analysis Introduction :** Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

**UNIT - VIII**

**Mining Complex Types of Data :** Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

**TEXT BOOKS :**

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELLE KAMBER Harcourt India.

**REFERENCES :**

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUNK PUJARI, University Press.
3. Data Warehousing In the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAMAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.

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**(CS 05522) SOFTWARE PROJECT MANAGEMENT**

**UNIT - I**

**Conventional Software Management :** The waterfall model, conventional software Management performance.

**Evolution of Software Economics :** Software Economics, pragmatic software cost estimation.

**UNIT - II**

**Improving Software Economics :** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

**The old way and the new :** The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

**UNIT - III**

**Life cycle phases :** Engineering and production stages, Inception, Elaboration, construction, transition phases. **Artifacts of the process :** The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

**UNIT - IV**

**Model based software architectures :** A Management perspective and technical perspective.

**Work Flows of the process :** Software process workflows, Iteration workflows,

**UNIT - V**

**Checkpoints of the process :** Major mile stones, Minor Milestones, Periodic status assessments.

**Iterative Process Planning :** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

**UNIT - VI**

**Project Organizations and Responsibilities :** Line-of-Business Organizations, Project Organizations, evolution of Organizations.

**Process Automation :** Automation Building blocks, The Project Environment.

**UNIT - VIII**

**Project Control and Process Instrumentation :** The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

**Tailoring the Process :** Process discriminants.

**UNIT - VIII**

**Future Software Project Management :** Modern Project Profiles, Next generation Software economics, modern process transitions.

**Case Study :** The command Center Processing and Display system- Replacement (CCPDS-R)

**TEXT BOOK :**

1. Software Project Management, Walker Royce: Pearson Education, 2005.

**REFERENCES :**

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management In practice, Pankaj Jalote, Pearson Education, 2005.

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**(CS 05048) ARTIFICIAL INTELLIGENCE**

(ELECTIVE I)

**UNIT - I**

**Introduction :** AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

**UNIT - II**

**Searching :** Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative deepening depth first search bi-direction search - comparison, Search with partial information (Heuristic search) Greedy best first search, A\* search, Memory bounded heuristic search, Heuristic functions.

**UNIT - III**

**Local search Algorithms,** Hill climbing, simulated, annealing search, local beam search, genetical algorithms.

**Constrain satisfaction problems :** Backtracking search for CSPs local search for constraint satisfaction problems.

**UNIT - IV**

**Game Playing:** Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

**UNIT - V**

**Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward, Chaining.**

**UNIT - VI**

**First order logic, Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.**

**UNIT - VII**

**Planning – Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state – space search, Forward states space search, Backward states space search, Heuristics for state space search, Planning search, planning with state space search, partial order planning Graphs.**

## UNIT - VIII

Learning – Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, Learning with complex data, learning with Hidden variables – The EM Algorithm, Instance Based learning, Neural Networks.

## TEXT BOOKS :

1. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/ Pearson Education.
2. Artificial Intelligence, 3<sup>rd</sup> Edition, Patrick Henry Winston, Pearson Edition.

## REFERENCES :

1. Artificial Intelligence , 2<sup>nd</sup> Edition, E.Rich and K.Knight (TMH).
2. Artificial Intelligence and Expert Systems – Patterson PHI.
3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
4. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.

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## (CS 05412) MOBILE COMPUTING

(Elective - I)

## UNIT - I

**Introduction to Mobile Communications and Computing :** Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.

**GSM :** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

## UNIT - II

**(Wireless) Medium Access Control :** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

## UNIT - III

**Mobile Network Layer :** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

## UNIT - IV

**Mobile Transport Layer :** Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission/ time-out freezing, Selective retransmission, Transaction oriented TCP.

## UNIT - V

**Database Issues :** Hoarding techniques, caching/invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

## UNIT - VI

**Data Dissemination:** Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

## UNIT - VII

**Mobile Ad hoc Networks (MANETS):** Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETS.

## UNIT - VIII

**Protocols and Tools :** Wireless Application Protocol-WAP . (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

## TEXT BOOKS :

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4, 7, 9, 10, 11), second edition, 2004.
2. Stojmenovic and Cacic, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

## REFERENCES :

1. Reza Behravand, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004.
2. Adelstein, Frank, Gupta, Sandeep K.S, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklaus, Slobier, "Principles of Mobile Computing", Springer, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.



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**(CS 05419) MULTIMEDIA AND APPLICATION DEVELOPMENT**  
(ELECTIVE - I)

**UNIT - I**

Fundamental concepts in Text and Image: Multimedia and Hypermedia, world wide web, overview of multimedia software tools, Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

**UNIT - II**

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

**UNIT - III**

**Action Script I:** ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.

**UNIT - IV**

**Action Script II :** Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

**UNIT - V**

**Application Development :** An OOP Application Framework, Using Components with ActionScript MovieClip Subclasses.

**UNIT - VI**

**Multimedia data compression :** Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

**UNIT - VII**

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

**UNIT - VIII**

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

**TEXT BOOKS :**

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PH/ Pearson Education.
2. Essentials ActionScript 2.0, Colin Moock, SPD O'REILLY.

**REFERENCES :**

1. Digital Multimedia, Nigel Chapman and Jenny Chapman, Wiley-Dreamtech
2. Macromedia Flash/MX Professional 2004 Unleashed, Pearson.
3. Multimedia and communications Technology, Steve Heath, Elsevier (Focal Press).
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
5. Multimedia Basics by Weikel Thomson
6. Multimedia Technology and Applications, David Hilman, Galgotia

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**(CS 05004) ADVANCED COMPUTER ARCHITECTURE**  
(ELECTIVE - II)

**Unit - I**

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

**Unit - II**

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing- operations in the instruction set- instructions for control flow- encoding an instruction set- the role of compiler

**Unit - III**

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs -high performance instruction delivery- hardware based speculation- limitation of ILP

**Unit - IV**

ILP software approach- compiler techniques- static branch prediction - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W solutions

**Unit - V**

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate - virtual memory- protection and examples of VM.

**Unit - VI**

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

**Unit - VII**

Storage systems- Types - RAID- errors and failures- bench marking a storage device- designing a I/O system.

**Unit - VIII**

Inter connection networks and clusters- interconnection network media - practical issues in interconnecting networks- examples - clusters- designing a cluster.

**TEXT BOOK :**

1. Computer Architecture A quantitative approach 3<sup>rd</sup> edition John L. Hennessy & David A. Patterson Morgan Kaufmann (An Imprint of Elsevier)

**REFERENCES :**

1. "Computer Architecture and parallel Processing" Kai Hwang and A. Briggs International Edition McGraw-Hill
2. Advanced Computer Architectures, Dezzo Sima, Terence Fountain, Peter Karsuk, Pearson.

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**(CS 05129) CLIENT SERVER COMPUTING**

(ELECTIVE - II)

**UNIT - I**

**Introduction to client server computing :** Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

**UNIT - II**

**Review of Java concepts :** Java fundamentals, Exceptions, Threads, Strings, Java applets, AWT, Swing, stream IO, Socket interface, RMI, RMI API, JDBC.

**UNIT - III**

**CORBA with Java :** Client/Server CORBA-style, The object web: CORBA with Java, CORBA / Java

**UNIT - IV**

**Core CORBA / Java :** Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count.

**UNIT - V**

**Other Technologies :** Creating client/ server application using java sockets, HTTP/CGI, Servlets, RMI, Caffeine

**UNIT - VI**

**Existential CORBA :** CORBA initialization protocol, CORBA activation services, CORBAIDL mapping CORBA java-to-IDL mapping, The introspective CORBA/Java object.

**UNIT - VII**

**Java Bean Component Model :** Events, properties, persistency, Introspection of beans, CORBA Beans.

**UNIT - VIII**

**EJBs and CORBA :** Object transaction monitors CORBA OTMs, EJB and CORBA OTMs, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

**TEXT BOOKS :**

1. Client/Server programming with Java and CORBA Robert Orfai and Dan Harkey, John Wiley & Sons, SPD 2<sup>nd</sup> Edition
2. Java programming with CORBA 3<sup>rd</sup> Edition, G.Brose, A Vogel and K.Duddy, Wiley-dreamtech, India John wiley and sons

**REFERENCES :**

1. Distributed Computing, Principles and applications, M.L.Liu, Pearson Education.
2. Client/Server Survival Guide 3<sup>rd</sup> edition Robert Orfai Dan Harkey & Jeri Edwards, John Wiley & Sons
3. Client/Server Computing D T Dewire, TMH.
4. IBM Webspere Starter Kit Ron Ben Natan Ori Sasson, TMh, New Delhi.

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**(CS 05423) NETWORK MANAGEMENT SYSTEMS**

(ELECTIVE - I)

**UNIT - I**

**Data communications and Network Management Overview :** Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

**UNIT - II**

**SNMPV1 Network Management :** Organization and Information and Information Models.

**Managed network :** Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

**UNIT - III**

**SNMPV1 Network Management :** Communication and Functional Models, The SNMP Communication Model, Functional model.

**UNIT - IV**

**SNMP Management: SNMPV2 :** Major Changes in SNMPV2, SNMPV2 System Architecture, SNMPV2 Structure of Management Information, The SNMPV2 Management Information Base, SNMPV2 Protocol, Compatibility With SNMPV1.

**UNIT - V**

**SNMP Management : RMON :** What is Remote Monitoring?, RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

**UNIT - VI**

**Telecommunications Management Network :** Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

**UNIT - VII**

**Network Management Tools and Systems:** Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

**UNIT - VIII**

**Web-Based Management:** MWS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network, Future Directions.

**TEXT BOOK :**

1. Network Management, Principles and Practice, Mani Subrahmanian, Pearson Education.

**REFERENCES :**

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

**(CS 05217) EMBEDDED SYSTEMS LAB**  
(89CSI Development Board)

1. Write a program to
  - a) Read inputs from switches
  - b) To make LEDs blink
2. Write a Program for serial communication
3. Write a program for encryption/decryption
4. Develop necessary interfacing circuit to read data from a sensor and process using the 8051 board. The data has to be displayed on a PC monitor.
5. Sort RTOS (mCOS) on to 89CS1 board and Verify.
6. Simulate on elevator movement using RTOS on 89CSI board.

Ref : KVKKF Prasad: 'Embedded/Real-Time Systems', Dreamtech, Press.

**(CS 05580) WEB TECHNOLOGIES LAB**

1. Develop static pages (using Only HTML) of an online Book store. The pages should resemble: [www.amazon.com](http://www.amazon.com) The website should consist the following pages:
  - Home page
  - Registration and user Login
  - User Profile Page
  - Books catalog
  - Shopping Cart
  - Payment By credit card
  - Order Conformation
2. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.
3. Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.
  4. Bean Assignments
    - a. Create a JavaBean which gives the exchange value of INR(Indian Rupees) into equivalent American/Canadian/Australian Dollar value.
    - b. Create a simple Bean with a label - which is the count of number of clicks. Then create a BeanInfo class such that only the "count" property is visible in the Property Window.
    - c. Create two Beans-a)KeyPad b)DisplayPad. After that integrate the two Beans to make it work as a Calculator.
    - d. Create two Beans Traffic Light(Implemented as a Label with only three background colours-Red,Green, Yellow) and Automobile(Implemented as a TextBox which states its state/movement). The state of the Automobile should depend on the following Light Transition Table:
 

Light Transition	Automobile State
Red → Yellow	Ready
Yellow → Green	Move
Green → Red	Stopped
5. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.
6. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.
7. Implement the "Hello World" program using JSP Struts Framework.

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**(HS 05352) MANAGEMENT SCIENCE****Unit - I**

**Introduction to Management:** Concepts of Management and organization- nature, importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

**Unit - II**

**Designing Organisational Structures :** Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

**Unit - III**

**Operations Management :** Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, Deming's contribution to quality.

**Unit - VI**

a) **Materials Management:** Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.

b) **Marketing:** Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

**Unit - V**

**Human Resources Management (HRM) :** Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs. PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

**Unit - VI**

**Project Management (PERT/CPM) :** Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (simple problems)

**Unit - VII**

**Strategic Management :** Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

**Unit - VIII**

**Contemporary Management Practices :** Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

**TEXT BOOKS :**

1. Aiyasri : Management Science, TMH, 2004.
2. Stoner, Freeman, Gilbert, Management, 6<sup>th</sup> Ed, Pearson Education, New Delhi, 2004.

**REFERENCES :**

1. Kotler Philip & Keller Kevin Lane: Marketing Management 12/e, PHI, 2005
  2. Koontz & Wehrlich: Essentials of Management, 6/e, TMH, 2005
  3. Thomas N. Duenning & John M. Ivancevich Management — Principles and Guidelines, Biztantra, 2003.
  4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.
  5. Memoria & S.V. Gaurker, Personnel Management, Himalaya, 25/e, 2005
  6. Samuel C. Certo: Modern Management, 9/e, PHI, 2005
  7. Schermerhorn, Capling, Poole & Wiesner: Management, Wiley, 2002.
  8. Parnell: Strategic Management, Biztantra, 2003.
  9. Lawrence R Jauch, R. Gupta & William F. Glueck: Business Policy and Strategic Management, Frank Bros: 2005.
  10. L.S.Srinath: PERT/CPM, Affiliated East-West Press, 2005.
- Unit VIII will have only short questions, not essay questions.

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**(CS 05302) IMAGE PROCESSING**  
(ELECTIVE III)

**UNIT - I**

**Introduction :** Examples of fields that use digital image processing; fundamental steps in digital image processing; components of image processing system. Digital Image Fundamentals: A simple image formation model, Image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21-44, 50-69).

**UNIT - II**

**Image enhancement in the spatial domain :** Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters; combining the spatial enhancement methods (p.nos 76-141).

**UNIT - III**

**Image restoration :** A model of the image degradation/restoration process, noise models, restoration in the presence of noise-only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos 147-167, 220-243, 256-276).

**UNIT - IV**

**Color Image Processing :** Color fundamentals, color models, pseudo color image processing, basics of full-color image processing, color transforms, smoothing and sharpening, color segmentation (p.nos: 282-339).

**UNIT - V**

**Image Compression :** Fundamentals, image compression models, error-free compression, lossy-predictive coding, image compression standards (p.nos: 409-467, 492-510).

**UNIT - VI**

**Morphological Image Processing :** Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms (p.nos:519-550).

**UNIT - VII**

**Image Segmentation :** Detection of discontinuous, edge linking and boundary detection, thresholding, region-based segmentation (p.nos:567-617).

**UNIT - VIII**

**Object Recognition :** Patterns and patterns classes; recognition based on decision-theoretic methods, matching; optimum statistical classifiers; neural networks; structural methods – matching shape numbers, string matching (p.nos: 693-735).

**TEXT BOOK :**

- Digital Image Processing, Rafael C.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.

**REFERENCES :**

- Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Havac and Roger Boyle, Second Edition, Thomson Learning.
- Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
- Computer Vision and Image Processing, Adrian Low, Second Edition, B.S. Publications
- Digital Image Processing using Matlab, Rafael C.Gonzalez, Richard E. Woods, Steven L. Eddins, Pearson Education.
- Digital Image Processing, William K. Prat, Willy Third Edition
- Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India, 2003.



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**(CS 05185) E - COMMERCE**  
(ELECTIVE - III)

**UNIT - I**

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

**UNIT - II**

Consumer Oriented Electronic commerce - Mercantile Process models.

**UNIT - III**

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

**UNIT-IV**

Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

**UNIT - V**

Intra Organizational Commerce - work Flow, Automation Customization and Internal Commerce, Supply chain Management.

**UNIT - VI**

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses, Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

**UNIT - VII**

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

**UNIT - VIII**

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.

**TEXT BOOK :**

1. Frontiers of electronic commerce – Kakakala, Whinston, Pearson.

**REFERENCES :**

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
2. E-Commerce, S.Jatwal – Galgotia
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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**(CS 05180) DISTRIBUTED DATABASES**  
(ELECTIVE - III)

**UNIT - I**

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

**UNIT - II**

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

**UNIT - III**

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

**UNIT - IV**

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

**UNIT - V**

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

**UNIT - VI**

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Deletion and Resolution of Inconsistency Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

**UNIT - VII**

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMS, Transactions as Objects.

**UNIT - VIII**

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMS, Query Optimization Issues, Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

**TEXT BOOKS :**

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill
2. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez - Pearson Education.

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**(CS 05573) VIRTUAL REALITY****(ELECTIVE - IV)****UNIT - I**

**Introduction :** The three I's of virtual reality, commercial VR technology and the five classic components of a VR system. (1.1, 1.3 and 1.5 of Text Book (1))

**UNIT - II**

**Input Devices :** (Trackers, Navigation, and Gesture Interfaces) : Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces. (2.1, 2.2 and 2.3 of Text Book (1)).

**UNIT - III**

**Output Devices:** Graphics displays, sound displays & haptic feedback. (3.1, 3.2 & 3.3 of Text Book (1))

**UNIT - IV**

**Modeling :** Geometric modeling, kinematics modeling, physical modeling, behaviour modeling, model management. (5.1, 5.2 and 5.3, 5.4 and 5.5 of Text Book (1)).

**UNIT - V**

**Human Factors:** Methodology and terminology, user performance studies, VR health and safety issues. (7.1, 7.2 and 7.3 of Text Book (1)).

**UNIT - VI**

**Applications:** Medical applications, military applications, robotics applications.

(8.1, 8.3 and 9.2 of Text Book (1)).

**UNIT - VII**

**VR Programming-I :** Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes.

(Chapters 14, 16 and 17 of Text Book (2))

**UNIT - VIII**

**VR Programming-II :** 3D Sprites, animated 3D sprites, particle systems. (Chapters 18, 19 and 21 of Text Book (2))

**TEXT BOOKS :**

1. Virtual Reality Technology, Second Edition, Gregory C. Burdea & Philippe Coffet, John Wiley & Sons, Inc.,
2. Killer Game Programming In Java, Andrew Davison, Orelly-SPD, 2005.

**REFERENCES :**

1. Understanding Virtual Reality, Interface, Application and Design, William R. Sherman, Alan Craig, Elsevier(Morgan Kaufmann).
2. 3D Modeling and surfacing, Bill Fleming, Elsevier(Morgan Kaufman).
3. 3D Game Engine Design, David H.Eberly, Elsevier.
4. Virtual Reality Systems, John Vince, Pearson Education.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

IV Year B.Tech. CSE - II Semester

T	P	C
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**(CS 05294) HUMAN COMPUTER INTERFACE****(ELECTIVE - IV)****UNIT - I**

**Introduction :** Importance of user interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

**UNIT - II**

**The graphical user interface –** popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

**UNIT - III**

**Design process –** Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

**UNIT - IV**

**Screen Designing :** Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

**UNIT - V**

**Windows –** New and Navigation schemes selection of window, selection of devices based and screen based controls.

**UNIT - VI**

**Components –** text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

**UNIT - VII**

**Software tools –** Specification methods, interface – Building Tools.

**UNIT - VIII**

**Interaction Devices –** Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

**TEXT BOOKS :**

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3<sup>rd</sup> Edition Ben Shneidermann, Pearson Education Asia.

**REFERENCES :**

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen, Pearson Education.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
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IV Year B.Tech. CSE - II Semester T P C  
4+1 0 4

**(CS 05005) ADVANCED COMPUTING CONCEPTS**  
(ELECTIVE - IV)

**UNIT I**

**Grid Computing** : Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

**UNIT II**

Autonomic Computing, Examples of the Grid Computing Efforts (IBM).

**UNIT III**

Cluster setup & its Advantages, Performance Models & Simulations, Networking Protocols & I/O, Messaging systems.

**UNIT IV**

Process scheduling, Load sharing and Balancing, Distributed shared memory, parallel I/O.

**UNIT - V**

Example cluster System - Beowlf: Cluster Operating systems: COM/PAS and NanOS

**UNIT - VI**

Pervasive Computing concepts & Scenarios; Hardware & Software; Human - machine interface.

**UNIT - VII**

Device connectivity, Java for Pervasive devices; Application examples

**UNIT - VIII**

Classical Vs Quantum logic gates; One ,two & three Qubit Quantum gates; Fredkin & Toffoli gates; Quantum circuits; Quantum algorithms.

**TEXT BOOK :**

1. "Selected Topics in Advance computing" Edited by Dr.P.Padmanabham and Dr. M.B.Srinivas, 2005 Pearson Education.

**REFERENCES :**

1. J. Joseph & C. Fellenstein: 'Grid Computing', Pearson Education.
2. J.Burkhardt et. al: 'Pervasive computing' Pearson Education
3. Marivesar: 'Approaching quantum computing', Pearson Education.
4. Raj Kumar Buyya: 'High performance cluster computing', Pearson Education.
5. Nielsen & Chung L: 'Quantum computing and Quantum Information', Cambridge University Press.
6. A networking approach to Grid Computing, Mitnoli, Wiley.