

# COURSE STRUCTURE AND DETAILED SYLLABUS

FOR

## INFORMATION TECHNOLOGY

For B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2012-2013)

REGULATION : R12



**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
(Autonomous under JNTUH)

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**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
(Autonomous under JNTUH)  
**B.TECH INFORMATION TECHNOLOGY**

**COURSE STRUCTURE AND SYLLABUS FOR R12 REGULATION**

**I YEAR**

Code	Subject	L	T/P/D	C
6751001	English	2	-	4
6751002	Mathematics-I	3	1	6
6751008	Mathematical Methods	3	1	6
6751004	Engineering Physics	2	1	4
6751005	Engineering Chemistry	2	-	4
6751006	Computer Programming & Data Structures	3	-	6
6751007	Engineering Drawing	2	3	4
6751632	Computer Programming Lab.	-	3	4
6751633	Engineering Physics& Engineering Chemistry Lab.	-	3	4
6751634	English Language Communication Skills Lab.	-	3	4
6751619	Engineering Workshop/IT Workshop	-	3	4
	<b>Total</b>	<b>17</b>	<b>18</b>	<b>50</b>

Code	Subject	L	T/P/D	C
6753036	Data Communication Systems	3	1	3
6753022	Mathematical Foundations of Computer Science	3	1	3
6753023	Data Structures Through C++	4	1	4
6753037	Digital Logic Design and Computer Organization	4	1	4
6753009	Electronic Devices and Circuits	4	-	4
6753025	Basic Electrical Engineering	3	1	3
6753616	Electrical & Electronics Lab.	-	3	2
6753617	Data Structures Lab Through C++	-	3	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>25</b>

**II YEAR II SEMESTER**

Code	Subject	L	T/P/D	C
6754028	Principles of Programming Languages	4	1	4
6754013	Data Base Management Systems	4	1	4
6754014	Object Oriented Programming	4	-	4
6754004	Environmental Studies	3	1	3
6754001	Probability and Statistics	3	1	3
6754016	Design and Analysis of Algorithms	3	1	3
6754618	Object Oriented Programming Lab	-	3	2
6754619	Data Base Management Systems Lab.	-	3	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>25</b>

### III YEAR I SEMESTER

Code	Subject	L	T/P/D	C
6755049	Automata and Compiler Design	4	1	4
6755050	Linux Programming	3	1	3
6755029	Software Engineering	3	1	3
6755031	Operating Systems	3	1	3
6755051	Computer Networks	4	-	4
6755015	Managerial Economics and Financial Analysis	4	1	4
6755617	Operating Systems & Computer Networks Lab(Through Linux)	-	3	2
6755618	Advanced English Communication Skills Lab.	-	3	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>25</b>

### III YEAR II SEMESTER

Code	Subject	L	T/P/D	C
6756032	Web Technologies	4	1	4
	<b>Open Elective</b>	3	1	3
6756051	Operations Research			
6756052	Intellectual Property Rights and Cyber Law			
6756053	Computer Forensics			
6756030	Network Security	3	1	3
6756054	Computer Graphics	4	1	4
6756055	Data warehousing and Data Mining	4		4
6756056	Embedded Systems	3	1	3
6756619	Embedded Systems& Data Mining Lab.	-	3	2
6756620	Web Technologies Lab.	-	3	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>25</b>

### IV YEAR I SEMESTER

Code	Subject	L	T/P/D	C
6757047	Software Testing Methodologies	3	1	3
6757079	Object Oriented Analysis and Design	4	-	4
6757080	Mobile Application Development	3	1	3
6757035	VLSI Design	4	1	4
	<b>Elective-I</b>	3	1	3
6757081	Wireless Networks and Mobile Computing			
6757073	Image Processing and Pattern Recognition			
6757056	Soft Computing			
6757082	Semantic Web and Social Networks			
	<b>Elective-II</b>	4	1	4
6757057	Information Retrieval Systems			
6757083	Human Computer Interaction			
6757084	Multimedia and Rich Internet Applications			
6757085	Scripting Languages			
6757617	Case Tools & Software Testing Lab.	-	3	2
6757618	Mobile Applications Development Lab.	-	3	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>25</b>

#### IV YEAR II SEMESTER

Code	Subject	L	T/P/D	C
6758007	Management Science	3	-	3
	<b>Elective-III</b>	3	1	3
6758035	Web Services			
6758040	E-Commerce			
6758064	Middleware Technologies			
6758045	Adhoc and Sensors Networks			
	<b>Elective-IV</b>	3	1	3
6758065	Design Patterns			
6758066	Distributed Systems			
6758040	Storage Area Networks			
6758068	Cloud Computing			
6758632	Industrial Oriented Mini Project	-	-	2
6758633	Seminar	-	6	2
6758634	Major Project	-	15	10
6758635	Comprehensive Viva	-	-	2
	<b>Total</b>	<b>9</b>	<b>23</b>	<b>25</b>

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

**T - Tutorial    L – Theory    P – Practical    C - Credits**

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

I YEAR

## ENGLISH

### Objectives:

- To enable the students acquire communicative competence in English for their academic and career pursuits.
- To help the students learn general and technical writing
- To train the students in communication skills and soft skills.

### Outcomes:

- Graduates will develop their language skills, communication skills, public speaking skills and soft skills and apply them in their day to day communication

### 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.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure by the students. Hence, it is suggested that they read it on their own with topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. *However, the stress in this syllabus is on skill development and practice of language skills.*

### 2. OBJECTIVES:

- a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
- b. To equip the students to study academic subjects with greater facility through the theoretical and practical components of the English syllabus.
- c. To develop the study skills and communication skills in formal and informal situations.

### 3. SYLLABUS:

#### Listening Skills:

##### Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that can comprehend the speech of people of different backgrounds and regions

*Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.*

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

#### Speaking Skills:

##### Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people

- Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: *Learning English : A Communicative Approach.*)
- Just A Minute(JAM) Sessions.

### Reading Skills:

#### Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

- 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 students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using 'unseen' passages which may be taken from the non-detailed text or other authentic texts, such as magazines/newspaper articles.*

### Writing Skills :

#### Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

- Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- 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:

#### *For Detailed study*

**1 First Text book entitled “Enjoying Everyday English”, Published by Sangam Books, Hyderabad**

#### *For Non-detailed study*

**1. Second text book “Inspiring Speeches and Lives”, Published by Maruthi Publications, Guntur**

### A. STUDY MATERIAL:

#### UNIT-I

- a. Sir C.V. Raman (Detail) A pathbreaker in the saga of Indian Science. (**Detail**)
- b. Leading a team and Work brings Solace ( from Wings of Fire)  
--University Press

#### UNIT-II

- a. The Connoisseur (Detail)
- b. Mother Theresa (Non-detail)

#### UNIT-III

- a. Kalpana Chawla “ Inspiration” (Detail)
- b. Sam Pitroda (Non-detail)

#### UNIT-IV

- a. Bubbling Well Road (Detail)
- b. I have a dream-Martin Luther king(Non-detail)

#### UNIT-V

- a. The Cuddalore Experience(Detail)
- b. Amartya kumar Sen(Non-detail)

#### UNIT-VI

- a. **Youth, Awake, Arise- STOP NOT TILL**

Swami Vivekananda Institute of Human Excellence,

- b. John F. Kennedy (Non-detail)

#### UNIT-VII

**Exercises on;**  
 Reading & Writing Skills  
 Reading Comprehension  
 Letter Writing  
 Essay Writing

#### UNIT-VIII

**Exercises on Remedial Grammar;**  
**Common errors in English**  
**Subject-Verb agreement**  
**Tense aspect**

**Vocabulary development-Synonyms, Antonyms, One word substitutes, Prefixes-Suffixes, Idioms, Phrases,**  
 Words often confused

#### REFERENCES :

1. **Innovate with English: A Course in English for Engineering Students**, edited by T Samson, Foundation Books
2. English Grammar Practice, **Raj N Bakshi**, **Orient Longman.**
3. **Effective English**, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson
4. Handbook of English Grammar& Usage, **Mark Lester and Larry Beason**, **Tata Mc Graw –Hill.**
5. Spoken English, **R.K. Bansal & JB Harrison**, **Orient Longman.**
6. Technical Communication, **Meenakshi Raman**, **Oxford University Press**
7. Objective English **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
8. Grammar Games, **Renuvolcuri Mario**, **Cambridge University Press.**
9. Murphy’s English Grammar with CD, **Murphy**, **Cambridge University Press.**
10. Everyday Dialogues in English, **Robert J. Dixon**, **Prentice Hall India Pvt Ltd.,**
11. ABC of Common Errors **Nigel D Turton**, **Mac Millan Publishers.**
12. Basic Vocabulary **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
13. Effective Technical Communication, **M Ashraf Rizvi**, **Tata Mc Graw –Hill.**
14. An Interactive Grammar of Modern English, **Shivendra K. Verma and Hemlatha Nagarajan** , **Frank Bros & CO**
15. A Communicative Grammar of English, **Geoffrey Leech, Jan Svartvik**, **Pearson Education**
16. Enrich your English, **Thakur K B P Sinha**, **Vijay Nicole Imprints Pvt Ltd.,**
17. A Grammar Book for You And I, **C. Edward Good**, **MacMillan Publishers.**

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**B.TECH (IT)**

**I YEAR**

**MATHEMATICS – I**

**Objective:**

- To impart the knowledge of solving first & second order differential equations provide ability to solve engineering mathematics problems.
- To get good acquaintance with the topic in differential calculus. To train the students in Laplace transforms & its applications

**Outcomes:**

- They are able to solve first order linear differential equations and applying this they find orthogonal trajectories of family of curves.
- The knowledge of integral calculus and applications of integrations enables them to find lengths of curves, volumes, surfaces and solids of revolution

**UNIT-I : Sequences - Series**

Basic definitions of Sequences and Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence

**UNIT-II : Differential equations of first order and their applications**

Overview of differential equations – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law natural growth and decay, orthogonal trajectories and geometrical applications.

**UNIT-III : Higher Order Linear differential equations and their applications**

Linear differential equations of second and higher order with constant coefficients, RHS term of the  $f(x)=e^{ax}$ ,  $\cos ax$ , and  $x^n$ ,  $e^{ax} V(x)$ ,  $x^n V(x)$  method of variation of parameters. Applications bending of beams, Electrical circuits, simple harmonic motion.

**UNIT-IV : Laplace transform and its application to Ordinary differential equations**

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-V : Function of Single Variable**

Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized mean value theorem (all theorems without proof) Functions of several variables – Functional dependence – Jacobian – Maxima and Minima of functions of two variables with constraints and without constraints.

**UNIT-VI : Application of Single variable**

Radius, Centre and Circle of Curvature-Evolutes and Envelopes Curve tracing – Cartesian, polar and parametric curves.

**UNIT-VII : Integration & its applications**

Riemann Sums, integral Representation for lengths, Areas, Volumes and Surface areas in Cartesian and polar coordinates, multiple integrals – double and triple integrals – change of order of integration – change of variable.

**UNIT-VIII : Vector Calculus**

Vector Calculus: Gradient-Divergence-Curl and their related properties, Potential function – Laplacian and second order operators. Line integral – work done – surface integrals-Flux of a vector valued functions.

Vector integrals theorem: Green's –Stock's and Gauss's Divergence Theorems (Statement & their verification).

**TEXT BOOKS:**

1. Engineering Mathematics by B.V.Ramana
2. Engineering Mathematics-I by T.K.V. Iyanar & B.Krishna Gandhi & Others, S.Chand

**REFERENCES:**

1. Engineering Mathematics-I by D.S.Chandrasekhar, Prison Books Pvt. Ltd.
2. Engineering Mathematics-I by G.Shankar Rao, I.K.International Publications.
3. Advanced Engineering Mathematics by Jain and S.R.K. Iyengar, Narosa Publications.
4. A text Book of KREYSZIG'S Engineering Mathematics, (Original KREYSZIG'S) WILEY Publications.
5. Engineering Mathematics-I by P.B.Bhaskara Rao, S.K.V.S.Rama chary, M.Bhujanga Rao,
6. Engineering Mathematics-I by C.Shankaraiah, VGS Booklinks.



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**B.TECH (IT)**

**I YEAR**

**MATHEMATICAL METHODS**

**Objective:**

- To get knowledge of different quadratic forms and polynomials.
- To get the familiarity with interpolation and different interpolation formulae To study about Fourier & Z-Transforms

**Outcomes:**

- The student knows about different quadratic forms polynomials and their solutions
- Student got the familiarity with Interpolation and different interpolation formulae Z-transforms and Fourier Transforms are useful in solving difference equations

**UNIT-I : Solution for linear systems**

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

**UNIT-II : Eigen values & Eigen Vectors**

Eigen values, Eigen vectors – properties, Cayley-Hamilton – Theorem (with Proof) – Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonization of matrix. Calculation of powers of matrix – Model and spectral matrices.

**UNIT-III : Linear Transformations**

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, Singular value decomposition.

**UNIT-IV : Solution of Non – linear Systems**

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 Difference – Backward difference – Central difference – Symbolic relations and separation of symbols – Difference Equations – Differences of polynomial – Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points

**UNIT-V : Curve fitting & Numerical Integration**

Curve fitting: Fitting a straight line – Second degree curve-exponential curve-power curve by method of least squares. Numerical Differentiation – Simpson's 3/8 Rule, Gaussian Integration.

**UNIT-VI : Numerical solution of IVP's in ODE**

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

**UNIT-VII :Fourier Series-Fourier Transform**

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 – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms, Parseval's formula.

### **UNIT-VIII : Z-Transform & Partial differential equations**

Z-Transform-Properties-Damping rule-shifting rule-Initial & Final value theorems-convolution theorem –solution of difference equation by Z-transform -Introduction and Formation of partial equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations.

#### **TEXT BOOKS:**

1. Engineering Mathematics by B.V.Ramana
2. Mathematical Methods by T.K.V. Iyanar & B.Krishna Gandhi & Others, S.Chand.

#### **REFERENCES:**

1. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
2. Mathematical Methods by G.Shankar Rao, I.K.International Publications, N.Delhi.
3. Mathematical Methods by V.Ravindranath, Etl, Himalaya Publications.
4. A text Book of KREYSZIG'S Mathematical Methods, Dr.A.Ramakrishna Prasad, WILEY Publications.
5. Mathematical Methods by P.B.Bhaskara Rao, S.K.V.S.Rama chary, M.Bhujanga Rao, B.S. Publications.
6. Mathematical Methods by K.V.Suryanarayana Rao by Scitech Publication.



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**B.TECH (IT)**

**I YEAR**

**ENGINEERING PHYSICS**

**Objective:**

- To provide students with the tools to address new engineering problems and contribute to emerging technology.
- To provide extensive exposure in the contemporary topics like LASERS, Fiber Optics, superconductivity, Nanotechnology, etc

**Outcomes**

- an ability to understand the general principles in Optics, electricity and magnetism, quantum mechanics, semiconductors, Lasers and Fiber optics & nanotechnology.
- Apply physics principles across disciplinary boundaries

**UNIT-I Physical Optics:**

1. Interference: Types of Interferences, Interference in thin films (reflected light) - Newton's rings.
2. Diffraction: Types of diffraction, Frounhoffer's Diffraction at a single slit, double slit and diffraction grating (N-slits).
3. Polarization: Introduction to polarization, Malus law, double refraction, Nicol's prism, Brewster's law  
Applications of Interference, Diffraction & Polarization in industry.

**UNIT-II Crystallography –XRD methods**

4. Crystallography : Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Diamond and hcp Structures, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal Systems.
5. X-ray Diffraction: Basic Principles, Bragg's Law, Laue Method, Powder Method, Applications of X-ray Diffraction.

**UNIT-III Defects in Crystals & Principles of Quantum Mechanics**

6. Defects in Crystals: Point Defects: Vacancies, Substitution, Interstitial, Frenkel and Schottky Defects, Concentration of vacancies at given temperature, concentration of Schottky & Frenkel defects, Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector, Surface Defects and Volume Defects. (Qualitative treatment)
7. Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, G. P. Thomson Experiment, Heisenberg's Uncertainty Principle, application of quantum mechanics in information security, Physical Significance of the Wave Function, Schrödinger's Time Independent Wave Equation -  
- Particle in One Dimensional Potential Box.

**UNIT-IV Band Theory of Solids**

8. Band Theory of Solids: Drawbacks of Classical free Electron theory, Quantum Free electron theory, Fermi energy and Density of States, Electron in a periodic Potential, Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), Origin of Energy Band Formation in Solids, Classification of Materials into Conductors, Semi Conductors & Insulators, Concept of Effective Mass of an Electron and Hole.
9. Semiconductor Physics: Fermi Level in Intrinsic and Extrinsic Semiconductors, Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration, Equation of Continuity, Direct & Indirect Band Gap Semiconductors, Hall Effect.

**UNIT-V Acoustics of Building & Acoustic Quieting and Ultrasonics**

10. Basic Requirement of Acoustically Good Hall, Reverberation and Time of Reverberation, Sabine's Formula for reverberation Time (Quantative treatment), Measurement of Absorption Coefficient of a Material, Factors Affecting The Architectural Acoustics and their Remedies.

**Ultrasonics:**

Concept of ultrasonics wave generation, Different methods of generation of Ultrasonic's (Piezostriktion and Magnetostriction), concept of NDT & Applications.

#### **UNIT-VI Dielectric and Magnetic Properties**

11. Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic (Quantitative) and Orientation Polarizations (Qualitative) and Calculation of Polarizabilities - Internal Fields in Solids, Clausius-Mossotti Equation, Piezo-electricity, Pyro-electricity and Ferro- electricity.

12. Magnetic Properties: Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magneton, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials, Ferrites and their Applications, Concept of Superconductivity, Meissner Effect, Magnetic Levitation, Applications of Superconductors.

#### **UNIT-VII Lasers and Fiber Optics**

13. Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

14. Fiber Optics: Constructions and Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers and Refractive Index Profiles, Attenuation in Optical Fibers, Application of Optical Fibers.

#### **UNIT-VIII Nanotechnology**

15. Introduction to Nanotechnology, Surface to Volume Ratio, Quantum Confinement, properties of Nanomaterials,

Synthesis methods: Bottom-up Fabrication: Sol-gel, Precipitation, Combustion Methods; Top-down Fabrication: Chemical Vapour Deposition, Physical Vapour Deposition, Pulsed Laser Vapour Deposition Methods,

Characterization: Difference between Optical Microscopy and Electron Microscopy, XRD&TEM,SEM, scanning Probe Microscopy (AFM & STM), Applications of Nanomaterials.

#### **TEXT BOOKS:**

1. Applied Physics - P.K.Palanisamy (SciTech Publications (India) Pvt. Ltd., Fifth Print 2008).
2. Applied Physics - S.O. Pillai & Sivakami (New Age International (P) Ltd., Second Edition 2008).
3. Applied Physics - T. Bhima Shankaram & G. Prasad (B.S. Publications, Third Edition 2008).
4. Engineering Physics – Hitendra K Malik A K Singh (Tata Mc Graw Hill Edu Pvt Ltd
5. Nanotechnology – M.Ranter & D.Ranter (Pearson Edu)
6. Solid State Physics – A J Dekker (Macmillan)
7. Engineering Physics – Adeel Ahmad & B S Bellubbi (Florence Publication , Hyd)

#### **REFERENCES:**

- 1.Solid state physics -- M.Arumugam
- 2 Applied physics – Mani naidu

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B.TECH (IT)

I YEAR

## ENGINEERING CHEMISTRY

### Objective:

- To provide a solid foundation in basic scientific and engineering principles
- To provide more information regarding the industrial side like water treatment and synthetic petrol
- To provide information about the hardness of water which will be very useful in every one's life through the long life

### Outcomes:

- An ability to understand the basic concepts in electrochemistry, water treatment and fuels and combustion
- Ability to accomplish engineering goals through teamwork
- Ability to assess the impact of engineering solutions in a global and societal context

### UNIT I:

**Electrochemistry and Batteries:** Concept of ElectroChemistry, Conductance-Electrolyte in solution, Conductance-Specific, Equivalent and molar conductance, Ionic mobilities, Kohlrausch's Law. Application of conductance. EMF: Galvanic Cells, types of Electrodes, Reference Electrode (SCE, Quinhydrone electrode), Ion Selective Electrodes (Glass Electrode) Nernst equation, Concentration Cells, Galvanic series, Potentiometric titrations, Florimetry, Numerical problems.

**Batteries:** Primary and secondary cells, (lead-Acid cell, Ni-Cd cell, Lithium cells). Applications of batteries, fuel cells – Hydrogen – Oxygen fuel cells, Advantages of fuel cells.

### UNIT II:

**Corrosion and its corrosion control:** Introduction, causes and different types of corrosion and effects of corrosion, theories of corrosion – Chemical, Electrochemical corrosion, corrosion reactions, factors affecting corrosion – Nature of metal – galvanic series, over voltage, purity of metal, nature of oxide film, nature of corrosion product. Nature of environment-effect of temperature, effect of pH, Humidity, effect of oxidant.

**Corrosion control methods –** Cathodic protection, sacrificial anode, impressed current cathode. Surface coatings – methods of application on metals- hot dipping, galvanizing, tinning, cladding, electroplating - Organic surface coatings – paints constituents and functions.

### UNIT III:

**Polymers:** Types of Polymerization, Mechanism (Chain growth & Step growth).Plastics: Thermoplastic resins & Thermoset resins. Compounding & fabrication of plastics, preparation, properties, engineering applications of: polyethylene, PVC, PS, Teflon, Bakelite, Nylon. Conducting polymers: Poly acetylene, polyaniline, conduction, doping, applications. Liquid Crystal polymers: Characteristics and uses Rubber – Natural rubber, vulcanization. Elastomers – Buna-s, Butyl rubber, Thiokol rubbers, Fibers – polyester, fiber reinforced plastics (FRP), applications

### UNIT IV:

**Water:** Introduction, Hardness: Causes, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water, numerical problems. Boiler troubles – Scale & sludge formation, caustic embrittlement, corrosion, priming & foaming Softening of water (Internal & external treatment-Lime soda, Zeolites, Ion exchange process and Numerical problems) Reverse osmosis, electro dialysis, electrodionization.

### UNIT V:

**Surface Chemistry:** Solid surfaces- types of adsorption- Langmuir adsorption isotherm, BET adsorption equation- Calculation of surface area of solid, application adsorption. Nanomaterials: Introduction, preparation and applications of Nanomaterials.

### UNIT VI:

**Energy sources:** fuels, classification – conventional fuels (solid, liquid, gaseous) Solid fuels – coal – analysis –

proximate and ultimate analysis and their significance Liquid fuels – primary – petroleum – refining of petroleum-cracking knocking synthetic petrol – Bergius and Fischer Tropsch's process; Gaseous fuels – natural gas, analysis of flue gas by Orsat's method Combustion – problems, Calorific value of fuel – HCV, LCV, determination of calorific value by Junker's gas calorimeter.

#### **UNIT VII:**

**Phase rule:** Definitions: phase, component, degree of freedom, phase rule equation. Phase diagrams - one component system: water system. Two component system lead- silver system, heat treatment based on iron-carbon phase diagram, hardening, annealing.

#### **UNIT VIII:**

**Materials Chemistry:** Cement: composition of Portland cement, manufacture of port land Cement, setting & hardening of cement (reactions). Lubricants: Criteria of a good lubricant, mechanism, properties of lubricants: Cloud point, pour point, flash & fire point, Viscosity. Refractories: Classification, Characteristics of a good refractory and Ceramics.

Introduction to analytical chemistry-IR, UV-Visible spectroscopy-theory and instrumentation -with simple examples.

#### **TEXT BOOKS:**

1. Text Book of Engineering Chemistry – Shashi Chawla, Dhanpat Rai publishing Company, New Delhi (2008).
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).
3. Text of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co, New Delhi (2006)

#### **REFERENCE BOOKS**

1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited , New Delhi (2006)
2. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills co., New Delhi (2004).
3. Chemistry of Engineering Materials by CV Agarwal, C.P Murthy, A.Naidu, BS Publications.
4. Chemistry of Engineering Materials by R.P Mani and K.N.Mishra, CENGAGE learning.
5. Applied Chemistry – A text for Engineering & Technology – Springer (2005).
6. Text Books of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).
7. Engineering Chemistry – R. Gopalan, D. Venkatappayya, D.V. Sulochana Nagarajan – Vikas Publishers (2008).

**COMPUTER PROGRAMMING AND DATA STRUCTURES****Objective:**

- To create awareness in computer fundamentals
- To train the students in C- Programming
- To train the students in Data structures

**Outcomes:**

- Students can do programming in C
- Have knowledge of computer fundamentals
- Have idea on data structures

**UNIT - I**

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programmes, Software Development Method, Algorithms, Pseudo code, flow charts, applying the software development method.

**UNIT - II**

Introduction to C Language – Background, Simple C Programme, Identifiers, Basic data types, Variables, Constants, Input / Output, Operators. Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Bit wise operators, Statements, Simple C Programming examples.

Selection Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, goto, Simple C Programming examples.

**UNIT - III**

Designing Structured Programmes, Functions, basics, user defined functions, inter function communication, Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion-recursive functions, Preprocessor commands, example C programmes

Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C programme examples.

**UNIT - IV**

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions, command –line arguments.

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C programme examples.

**UNIT - V**

Derived types – Structures – Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit fields, enumerated types, C programming examples.

**UNIT - VI**

Input and Output – Concept of a file, streams, standard input / output functions, formatted input / output functions, text files and binary files, file input / output operations, file status functions (error handling), C programme examples.

**UNIT – VII**

Searching and Sorting – Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

**UNIT - VIII**

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation,

insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack application-infix to postfix conversion, postfix expression evaluation, recursion implementation, Queues-operations, array and linked representations.

**TEXT BOOKS :**

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Fifth Edition, Pearson education.

**REFERENCES:**

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
2. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education
3. C Programming with problem solving, J.A. Jones & K. Harrow, dreamtech Press
4. Programming in C – Stephen G. Kochan, III Edition, Pearson Eductaion.
5. C for Engineers and Scientists, H.Cheng, Mc.Graw-Hill International Edition
6. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
7. C Programming & Data Structures, E. Balagurusamy, TMH.
8. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
9. C& Data structures – E V Prasad and N B Venkateswarlu, S. Chand&Co.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

I YEAR

## ENGINEERING DRAWING

### Objective:

- To be range proficient in preparation analyzing, and inter preparation of the
- engineering drawings in any scale of projection
- The course illustrates the techniques of drawing actual practice.
- This preliminary course aims at building a foundation for the further course in drawing and other allied subjects.
- The concepts of Engineering Drawing is used to develop, express the ideas, and conveying the instructions which are used to carry out jobs in the field of Engineering.

### Outcomes:

- Draw different engineering curves and know their applications.
- Draw orthographic projections of different objects.
- Visualize three dimensional objects and draw isometric projections.
- Use these techniques and able to interpret the drawing in engineering field

### UNIT – I

**INTRODUCTION TO ENGINEERING DRAWING :** Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions. Curves used in Engineering Practice & their Constructions :

- a) Conic Sections including the Rectangular Hyperbola – General method only.
- b) Cycloid, Epicycloid and Hypocycloid
- c) Involute.
- d) Scales: Different types of Scales, Plain scales comparative scales, scales of chords.

### UNIT – II

**DRAWING OF PROJECTIONS OR VIEWS ORTHOGRAPHIC PROJECTION IN FIRST ANGLE**

**PROJECTION:** Principles of Orthographic Projections – Conventions – First and Third Angle, Projections of Points and Lines inclined to both planes, True lengths, traces.

### UNIT – III

**PROJECTIONS OF PLANES & SOLIDS:** Projections of regular Planes, auxiliary planes and Auxiliary projection inclined to both planes. Projections of Regular Solids inclined to both planes – Auxiliary Views.

### UNIT – IV

**SECTIONS AND SECTIONAL VIEWS:-** Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

### UNIT – V

**DEVELOPMENT AND INTERPENETRATION OF SOLIDS:** Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramid Cone and their parts. Interpenetration of Right Regular Solids

### UNIT - VI

**INTERSECTION OF SOLIDS:-** Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

### UNIT –VII

**ISOMETRIC PROJECTIONS :** Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

## UNIT – VIII

**TRANSFORMATION OF PROJECTIONS :** Conversion of Isometric Views to Orthographic Views – Conventions, Introduction to perspective projections(Practise not required)

### TEXT BOOK :

1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing and Graphics, Venugopal / New age.
3. Engineering Drawing – Basant Agrawal, TMH

### REFERENCES :

1. Engineering drawing – P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. International.
5. Engineering Drawing – Grower.
6. Engineering Graphics for Degree – K.C. John.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

I YEAR

## COMPUTER PROGRAMMING LAB

### Objectives:

- To make the student learn a programming language.
- To teach the student to write programs in C to solve the problems.
- To Introduce the student to simple linear data structures such as lists, stacks, queues.

### Recommended Systems/Software Requirements:

- Intel based desktop PC
- ANSI C Compiler with Supporting Editors

### Week 1.

- Write a C program to find the sum of individual digits of a positive integer.
- A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
- Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

### Week 2.

- Write a C program to calculate the following Sum:  
$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$
- Write a C program to find the roots of a quadratic equation.

### Week 3

- Write C programs that use both recursive and non-recursive functions
  - To find the factorial of a given integer.
  - To find the GCD (greatest common divisor) of two given integers.
  - To solve Towers of Hanoi problem.

### Week 4

- The total distance travelled 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 travelled 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'.
- Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, \*, /, % and use Switch Statement)

### Week 5

- Write a C program to find both the largest and smallest number in a list of integers.
- Write a C program that uses functions to perform the following:
  - Addition of Two Matrices
  - Multiplication of Two Matrices

### Week 6

- Write a C program that uses functions to perform the following operations:
  - To insert a sub-string in to a given main string from a given position.
  - To delete n Characters from a given position in a given string.
- Write a C program to determine if the given string is a palindrome or not

### Week 7

- Write a C program that displays the position or index in the string S where the string T begins, or - 1 if S doesn't contain T.
- Write a C program to count the lines, words and characters in a given text.

### Week 8

- Write a C program to generate Pascal's triangle.
- Write a C program to construct a pyramid of numbers.

### Week 9

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:

$$1+x+x^2+x^3+\dots+x^n$$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Print x, n, the sum

Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal ? If so, test for them too.

#### **Week 10**

a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

b) Write a C program to convert a Roman numeral to its decimal equivalent.

#### **Week 11**

Write a C program that uses functions to perform the following operations:

- i) Reading a complex number
- ii) Writing a complex number
- iii) Addition of two complex numbers
- iv) Multiplication of two complex numbers

(Note: represent complex number using a structure.)

#### **Week 12**

a) Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file.

(Note: The file name and n are specified on the command line.)

#### **Week 13**

a) Write a C programme to display the contents of a file.

b) Write a C programme to merge two files into a third file ( i.e., the contents of the first file followed by those of the second are put in the third file)

#### **Week 14**

Write a C program that uses functions to perform the following operations on singly linked list.:

- i) Creation
- ii) Insertion
- iii) Deletion
- iv) Traversal

#### **Week 15**

Write C programs that implement stack (its operations) using i) Arrays ii) Pointers

#### **Week 16**

Write C programs that implement Queue (its operations) using i) Arrays ii) Pointers

#### **Week 17**

Write a C program that uses Stack operations to perform the following:

- i) Converting infix expression into postfix expression
- ii) Evaluating the postfix expression

#### **Week 18**

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order

- i) Bubble sort
- ii) Selection sort

#### **Week 19**

Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :

- i) Linear search
- ii) Binary search

#### **Week 20**

Write C program that implements the following sorting method to sort a given list of integers in ascending order:

- i) Quick sort

#### **Week 21**

Write C program that implement the following sorting method to sort a given list of integers in ascending order:

- i) Merge sort

#### **Week 22**

Write C programs to implement the Lagrange interpolation and Newton- Gregory forward interpolation.

#### **Week 23**

Write C programs to implement the linear regression and polynomial regression algorithms.

## Week 24

Write C programs to implement Trapezoidal and Simpson methods.

### Text Books

1. C programming and Data Structures, P. Padmanabham, Third Edition, BS Publications
2. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
3. The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
4. Practical C Programming, Steve Oualline, O'Reilly, SPD. TMH publications.
5. Computer Basics and C Programming, V. Rajaraman, PHI Publications.
6. Data structures and Program Design in C, R.Kruse, C.L.Tondo, B.P.Leung, M.Shashi, Pearson Education.



**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
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**B.TECH (IT)**

**I YEAR**

**ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB**

**Objective:**

- Aimed to train the students to measure different optical, electrical and physical properties of the materials experimentally
- To know the composition, preparation and amount of substance
- The constituents of quality control and important aspect of Engineering are basically chemical in nature and they are known

**Outcomes:**

- At the end of the course, student should be able to
- Understand scientific Concepts
- Apply the concepts in solving engineering problems could able to select materials with suitable properties for particular applications

**ENGINEERING PHYSICS LAB**  
(Any twelve experiments compulsory)

1. Dispersive power of the material of a prism – Spectrometer
2. Determination of wavelength of a source – Diffraction Grating.
3. Newton's Rings - Radius of curvature of plano convex lens.
4. Melde's experiment – Transverse and longitudinal modes.
5. Time constant of an R-C circuit.
6. L-C-R circuit.
7. Magnetic field along the axis of current carrying coil – Stewart and Gees method.
8. Study the characteristics of LED and LASER sources.
9. Study the characteristics of p-i-n and avalanche photodiode detectors.
10. Bending losses of fibres.
11. Evaluation of numerical aperture of given fibre.
12. Energy gap of a material of p-n junction.
13. Thermo electric effect – Seebeck effect and Peltier effect.
14. Torsional pendulum.
15. Single slit diffraction using laser.

**ENGINEERING CHEMISTRY LAB**  
**List of Experiments (Any 12 of the following):**

**Titrimetry:**

- a. Estimation of hardness of water by EDTA method. (or)  
Estimation of calcium in limestone by Permanganometry.

**Mineral Analysis:**

- 2 Determination of percentage of copper in brass
- 3 Estimation of manganese dioxide in pyrolusite.

**Instrumental Methods:**

4. **Colorimetry:**

Determination of ferrous iron in cement by colorimetric method.  
(Or) Estimation of Copper by Colorimetric method.

5. **Conductometry:**

Conductometric titration of strong acid Vs strong base.  
(or) Conductometric titration of mixture of acids Vs strong base.

6. **Potentiometry:**

Titration of strong acid Vs strong base by potentiometry.  
(or) Titration of weak acid Vs strong base by potentiometry.

**Physical Properties:**

7. Determination of viscosity of sample oil by redwood/oswald's viscometer
8. Determination Surface Tension of lubricants.

**Identification and Preparations:**

9. Identification of functional groups present in organic compounds.
10. Preparation of organic compounds  
Asprin (or) Benzimidazole

**Kinetics:**

11. To determine the rate constant of hydrolysis of methyl acetate catalysed by an acid and also the energy of activation.  
(or) To study the kinetics of reaction between  $K_2S_2O_8$  and KI.
12. Demonstration Experiments ( Any One of the following ) :
  - a. Determination of dissociation constant of weak acid-by PH metry
  - b. Preparation of Thiokol rubber
  - c. Adsorption on Charcoal
  - d. Heat of reaction

**TEXT BOOKS:**

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

**REFERENCE BOOKS:**

1. Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel.
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

I YEAR

## ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

### Objectives:

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

### SYLLABUS :

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

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

### Minimum Requirement:

The **English Language Lab** shall have two parts:

- i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

### System Requirement ( Hardware component):

*Computer network with Lan with minimum 60 multimedia systems with the following specifications:*

- i) P – IV Processor
  - a) Speed – 2.8 GHZ
  - b) RAM – 512 MB Minimum
  - c) Hard Disk – 80 GB
- ii) Headphones of High quality

### Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- The Rosetta Stone English Library.
- Clarity Pronunciation Power – Part I.
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7<sup>th</sup> Edition.
- Learning to Speak English - 4 CDs.
- Vocabulary in Use, Michael McCarthy, Felicity O'Den, Cambridge.
- Murphy's English Grammar, Cambridge with CD.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

**Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):**

1. **A Handbook for English Language Laboratories** – Prof. E. Suresh Kumar, P. Sreehari, Foundation Books.
2. **Effective Communication & Public Speaking** by S. K. Mandal, Jaico Publishing House.
3. **English Conversation Practice** by Grant Taylor, Tata McGraw Hill.
4. **Speaking English effectively** by Krishna Mohan, N. P. Singh, Mac Millan Publishers.
5. **Communicate or Collapse: A Handbook of Effective Public Speaking, Group Discussions and Interviews**, by Pushpa Lata & Kumar, Prentice-Hall of India.
6. **Learn Correct English, Grammar, Usage and Composition** by Shiv. K. Kumar & Hemalatha Nagarajan, Pearson Longman
7. **Spoken English** by R. K. Bansal & J. B. Harrison, Orient Longman.
8. **English Language Communication: A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr. G. Natanam & Prof. S. A. Sankaranarayanan, Anuradha Publications, Chennai.
9. **Effective Technical Communication**, M. Ashraf Rizvi, Tata McGraw-Hill.
10. **A Practical Course in English Pronunciation**, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
11. **A text book of English Phonetics for Indian Students** by T. Balasubramanian, Mac Millan
12. **Spoken English: A foundation Course, Parts 1 & 2**, Kamlesh Sadanand and Susheela punitha, Orient Longman

#### **DISTRIBUTION AND WEIGHTAGE OF MARKS**

##### ***English Language Laboratory Practical Paper:***

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-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 year-end Examination shall be conducted by an external examiner/ or the teacher concerned with the help of another member of the staff of the same department of the same institution.

**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
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**B.TECH (IT)**

**I YEAR**

**IT WORKSHOP/ ENGINEERING WORKSHOP**

**Objectives :**

The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point

**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 MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. **The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.**

**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 and power point presentations using the Microsoft suite of office tools and LaTeX. **(Recommended to use Microsoft office 2007 in place of MS Office 2003)**

**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 MS windows 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 : 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 6 – Task 6 : 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.

**Internet & World Wide Web**

**Week 7 - 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 8 - 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 9 - 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 by the student.

**Week 10 - 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.

### **Productivity tools**

#### **LaTeX and Word**

**Week 11 – Word Orientation:** The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the three 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.

**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 12 - 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 13 - 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, Paragraphs and Mail Merge in word.

#### **Excel**

**Week 14 - Excel Orientation:** The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the two 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 15 - 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, LOOKUP/VLOOKUP, Sorting, Conditional formatting

#### **LaTeX and MS/equivalent (FOSS) tool Power Point**

**Week 16 - 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 Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

**Week 17- 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 18 - 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 slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

#### **REFERENCES :**

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Introduction to Computers, Peter Norton, 6/e Mc Graw Hill
4. Upgrading and Repairing, PC's 18<sup>th</sup> e, Scott Muller QUE, Pearson Education
5. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
7. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)

#### **ENGINEERING WORKSHOP**

##### **1. TRADES FOR EXERCISES :**

**At least two exercises from each trade:**

1. House Wiring
2. Carpentry
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Fitting

##### **2. TRADES FOR DEMONSTRATION & EXPOSURE:**

1. Metal Cutting (Water Plasma)
- 2 Power Tools in Construction, wood working, Electrical Engineering and Mechanical Engineering

##### **TEXT BOOK:**

1. Work shop Manual - P.Kannaiah/ K.L.Narayana, Scitech Publishers.
2. Workshop Manual by Venkat Reddy

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

II YEAR I SEM

## DATA COMMUNICATION SYSTEMS

### Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.

### Outcomes:

- After this course students could understand and explore the basics of Computer Networks and Various Protocols. She/he will be in a position to understand the World Wide Web concepts.
- After this course he/she will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and ad hoc networks.

### UNIT I :

**INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING:** Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements, Data communications Networks, Alternate Protocol Suites.

#### **SIGNALS, NOISE, MODULATION, AND DEMODULATION :**

Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and  $M$ -ary Encoding, Digital Modulation.

### UNIT II :

#### **METALLIC CABLE TRANSMISSION MEDIA :**

Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves, Transmission Line Classifications, Metallic Transmission Line Types, Metallic Transmission Line Equivalent Circuit, Wave Propagation on Metallic Transmission Lines, Metallic Transmission Line Losses.

#### **OPTICAL FIBER TRANSMISSION MEDIA :**

Advantages of Optical Fiber Cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, The Physics of Light, Velocity of Propagation, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

### UNIT III :

#### **DIGITAL TRANSMISSION :**

Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage –to-Quantization Noise Voltage Ration, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

#### **MULTIPLEXING AND T CARRIERS :**

Time- Division Multiplexing, T1 Digital Carrier System, North American Digital Multiplexing Hierarchy, Digital Line Encoding, T Carrier systems, European Time- Division Multiplexing, Statistical Time – Division Multiplexing, Frame Synchronization, Frequency- Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Optical Network

### UNIT IV :

#### **WIRLESS COMMUNICATIONS SYSTEMS :**

Electromagnetic Polarization, Rays and Wavefronts, Electromagnetic Radiation, Spherical Wavefront and the Inverse Square Law, wave Attenuation and Absorption, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Microwave Communications Systems, Satellite Communications Systems.

**UNIT V :****TELEPHONE INSTRUMENTS AND SIGNALS:**

The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

**THE TELEPHONE CIRCUIT:**

The Local Subscriber Loop, Telephone Message- Channel Noise and Noise Weighting, Units of Powers Measurement, Transmission Parameters and Private-Line Circuits, Voice-Frequency Circuit Arrangements, Crosstalk.

**UNIT VI :****CELLULAR TELEPHONE SYSTEMS:**

First- Generation Analog Cellular Telephone, Personal Communications system, Second-Generation Cellular Telephone Systems, N-AMPS, Digital Cellular Telephone, Interim Standard, North American Cellular and PCS Summary, Global system for Mobile Communications, Personal Communications Satellite System.

**UNIT VII:****DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS:**

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

**DATA COMMUNICATIONS EQUIPMENT:**

Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems- Compatible Voice- Band Modems, Voice- Band Modern Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, ITU-T Voice- Band Modem Specifications, 56K Modems, Modem Control: The AT Command Set, Cable Modems, Probability of Error and Bit Error Rate.

**UNIT VIII:****DATA –LINK PROTOCOLS:**

Data –Link Protocol Functions, Character –and Bit- Oriented Protocols, Data Transmission Modes, Asynchronous Data – Link Protocols, Synchronous Data – Link Protocols, Synchronous Data – Link Control, High – Level Data – Link Control.

**TEXT BOOKS:**

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

**REFERENCE BOOKS**

1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition. TMH.
2. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson
3. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

II YEAR I SEM

## MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

### Objectives:

- To develop problem-solving techniques and explore topics in a variety of areas of discrete mathematics, including but not limited to logic, graph theory, set theory, recursions, combinatorics, and algorithms. Students will learn to express statements in the language of formal logic and draw conclusions, model situations in terms of graph and set theory, find and interpret recursive definitions for mathematical sequences, use combinatorial methods to approach counting problems.

### Outcomes:

- Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations inclusion/exclusion principle and the pigeonhole methodology.
- Ability to represent and Apply Graph theory in solving computer science problems

### UNIT-I

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

### UNIT-II

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

### UNIT-III

**Relations**: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. **Functions**: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,

### 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. Pigeon hole principles and its application

### 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. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.

**REFERENCES :**

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.
4. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
5. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.



**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
**(Autonomous under JNTUH)**

**B.TECH (IT)**

**II YEAR I SEM**

**DATA STRUCTURES THROUGH C++**

**Objectives:**

- To familiar with sorting algorithms including bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort and radix sort.
- To master searching methods including linear search, binary search and Fibonacci search.
- To familiar with the implementation of elementary and advanced data structures such as linked lists, stacks, queues, binary trees and binary search trees, balanced trees.
- To familiar with the implementation of some graph algorithms such as graph traversals, shortest path and minimum spanning tree.

**Outcomes:**

- Understand recursion and design algorithms using recursion.
- Understand several sorting algorithms including bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort and radix sort.
- Be familiar with several searching methods including linear search, binary search and Fibonacci search
- Master the implementation of elementary data structures such as linked lists, stacks, queues, binary trees and binary search trees.
- Be familiar with the implementation of advanced data structures such as balanced search trees, priority queues and the set data structures.

**UNIT I :**

C++ Class Overview- Basic OOP concepts, Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

**UNIT II :**

Function Overloading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

**UNIT III :**

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, array and linked Implementations using template classes in C++.

Trees – Basic Terminology, Binary tree ADT, array and linked representations, traversals, threaded binary trees.

**UNIT IV :**

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, Hashing- 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 V :**

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Heap sort, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

**UNIT VI :**

Search Trees (Part1):

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Operations – Insertion and Searching

**UNIT VII :**

**Search trees (part- II):** B-Trees, Definition, B-Tree of order m, insertion, deletion and searching, Comparison of Search Trees

Graphs – Basic terminology, representations of Graphs, Graph search methods – DFS, BFS.

**UNIT VIII :**

**Text Processing -** Pattern matching algorithms-Brute force, the Knuth-Morris-Pratt algorithm, Tries- Standard Tries, Compressed Tries, Suffix tries.

**TEXT BOOKS :**

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition, seventh 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 and algorithms in C++, 3rd Edition, Adam Drozdek, Cengage Learning.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
5. Data Structures using C++, D.S. Malik, Cengage Learning, India Edition.
6. Data structures with C++ Using STL, 2<sup>nd</sup> edition, W.H.Ford and W.R.Topp, Pearson/PHI
7. Mastering Algorithms with C, K.Loudon, O'Reilly, SPD pvt. Ltd.
8. An Introduction to Data structures and Algorithms, J.A.Storer, Springer.
9. Advanced Data structures & Algorithms in C++, V.V.Muniswamy, Jaico Publishing House.

**DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION**

**Objectives:**

- To introduce various number systems and their applications.
- To introduce boolean algebra and its relevance to computer science.
- To minimise boolean expressions using boolean algebra and K-Maps.
- To design combinational and sequential logic circuits..

**Outcomes:**

- Work with various number systems.
- Apply knowledge of number systems, codes and Boolean algebra to the analysis and design of digital logic circuits.
- Convert boolean functions into cononical and standard forms.
- Minimize boolean expressions.
- Analyse and design combinational circuits.
- Analyse and design sequential circuits.

**UNIT I**

**BASIC STRUCTURE OF COMPUTERS :** Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations.

**DATA REPRESENTATION:** Binary Numbers, Fixed Point Representation. Floating – Point Representation. Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes.

**UNIT II**

**DIGITAL LOGIC CIRCUITS-I:**

Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. Flip-flops.

**UNIT III**

**DIGITAL LOGIC CIRCUITS-II:**

Registers, Shift Registers, Binary counters, Decoders, Multiplexers, Programmable Logic Devices.

**UNIT IV**

**COMPUTER ARITHMETIC:** Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance arithmetic.

**UNIT V**

**INSTRUCTION SET & ADDRESSING:** Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.

**UNIT VI**

**PROCESSOR ORGANIZATION:** Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Microprogrammed Control

**UNIT VII**

**MEMORY ORGANIZATION :** Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

**UNIT VIII**

**INPUT / OUTPUT ORGANIZATION:** Introduction to I/O, Interrupts- Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces.

**TEXT BOOKS :**

1. COMPUTER ORGANIZATION – Carl Hamacher, Zvonko Vranesic, Safwat Zaky, fifth edition, McGraw Hill.
2. COMPUTER ARCHITECTURE AND ORGANIZATION- An Integrated Approach, Miles Murdocca, Vincent Heuring, Second Edition, Wiley India.
3. COMPUTER SYSTEMS ARCHITECTURE – M.Moris Mano, IIIrd Edition, Pearson.

**REFERENCES :**

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson
2. Computer- organization and Design- David A. Paterson and John L.Hennessy-Elsevier.
3. Fundamentals or Computer Organization and Design, - Sivarama Dandamudi Springer Int. Edition.
4. DIGITAL DESIGN – Third Edition , M.Morris Mano, Pearson Education/PHI.
5. FUNDAMENTALS OF LOGIC DESIGN, Roth, 5th Edition,Thomson.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

II YEAR I SEM

## ELECTRONIC DEVICES AND CIRCUITS

### Objectives:

- To teach students the motion of charged particles in electric and magnetic fields and principles of CRT.
- To understand semiconductors and P – N Junction.
- To understand V-I characteristics of Zener diode, varactor, LED.
- To teach how to use diode as rectifier, operation and performance parameters of different rectification with filter.
- To explain zener diode its structure, qualitative and quantitative aspects of BJT, FET, MOSFET, SCR and UJT.
- To know biasing of BJT and various compensation techniques.
- To teach h.-parameters of BJT and use it to analyze various amplifiers for  $A_i$ ,  $R_i$ ,  $A_v$ ,  $R_o$ .

### Outcomes:

- Trace the motion of charged particles in electric and magnetic fields and understand the principles of CRT.
- Understand the physics of semiconductors and p-n junctions, operations and VI characteristics of PN, Zener, Tunnel, Varactor, Light Emitting, and Photo diodes.
- Understand operation of zener diode, qualitative and quantitative aspects and characteristics of BJT, FET, MOSFET, SCR and UJT.
- Know biasing of BJT and various compensation techniques.
- Understand low frequency H parameter model for BJT and use it to analyse various amplifiers.

### UNIT- I: p-n Junction Diode

Qualitative Theory of p-n Junction, p-n Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semi Conductor Diodes, Zener Diode Characteristics.

### UNIT- II: Rectifiers and Filters

The p-n junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters,  $\pi$ - Section Filters, Comparison of Filters, Voltage Regulation using Zener Diode.

### UNIT- III: Bipolar Junction Transistor

The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation, BJT Specifications.

### UNIT- IV: Transistor Biasing and Stabilization

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in  $V_{BE}$  and  $\beta$ , Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

### UNIT- V: Small Signal Low Frequency BJT Models

BJT Hybrid Model, Determination of h-parameters from Transistor Characteristics, Analysis of a Transistor Amplifier Circuit using h-Parameters, Comparison of CB, CE, and CC Amplifier Configurations.

### **UNIT-VI: Field Effect Transistor**

The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

### **UNIT VII: FET Amplifiers**

FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT and FET.

### **UNIT VIII: INDUSTRIAL ELECTRONIC DEVICES & APPLICATIONS:**

Negative resistance Devices, Uni junction Transistor(UJT), UJT Relaxation Oscillator, Programmable UJT(PUT), Silicon Controlled Rectifier(SCR), Transient Effect in SCR, Light Activated SCR(LASCR), SILICON Controlled Switch(SCS), Schottky Barrier Diode, DIAC, TRIAC Diodes & Their characteristics.

### **TEXT BOOKS:**

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit, 2ed., 1998, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 ed., 2006, PEI/PHI.  
Introduction to Electronic Devices and Circuits - Rober T. Paynter, PE.

### **REFERENCE BOOKS:**

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 ed., 2008, TMH.
2. Electronic Devices and Circuits - K. Lal Kishore, 2 ed., 2005, BSP.
3. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 ed., 2009, Wiley India Pvt. Ltd.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 ed., 2008, TMH.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

II YEAR I SEM

## BASIC ELECTRICAL ENGINEERING

### Objectives:

- Introduce students to the basic fundamentals of Electric Circuits, their components and the mathematical tools used to represent and analyze Electrical circuits.
- Understand fundamentals, including Ohm's law, Kirchoff's laws and be able to solve for currents, voltages and power in complex circuits
- Have the ability to write and solve loop current and node voltage equations for arbitrary DC, AC networks including resistors, capacitors, inductors, dependent and independent sources.
- Develop the skills in the design and analysis of basic DC and AC circuits with network topologies.
- Ability to formulate Network theorems at an arbitrary interface set of points for complex networks including dependent and independent sources.

### Outcomes:

- Able to explain basic electrical concepts, including electric charge, current, electrical potential, electrical Power and energy.
- Able to explain the relationship of voltage and current in resistors, capacitors, inductors, and mutual Inductors.
- Able to analyze circuits with ideal, independent, and controlled voltage and current sources.
- Able to apply Kirchoff's voltage and current laws to the analysis of electric circuits.
- Able to apply concepts of electric network topology, nodes, branches, and loops to solve circuit problems, including the use of computer simulation.

### UNIT - I

**Introduction to Electrical Engineering :** ohm's law, basic circuit components, 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

**Alternating Quantities:** Principle of ac voltages, waveforms and basic definitions, 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.

### UNIT-IV

**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

**D.C Generators:** Principle of operation of dc machines, types of D.C generators, e.m.f equation in D.C generator.

### UNIT-V

**D.C motors:** Principle of operation of dc motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C generator

### UNIT-VII

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

## 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 & Electronics Engineering by D.P.Kothari & I.J.Nagarath, TMH, 2013.
2. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
3. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
4. Electrical and Electronic Technology-By Hughes – Pearson Education.

### REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & 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.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

II YEAR I SEM

## ELECTRICAL AND ELECTRONICS LAB

### Objectives:

- To assist students in obtaining better understanding of operation and specifications of electronic components.
- To develop necessary skills in analyzing electronic circuits as well as required practical skills.
- To develop the skills such as work with small team to carry out experiments.
- To develop the ability to write professional lab reports based on experimental observations in lab and theory.

### Outcomes:

- Understand various types of business organizations.
- Able to make decisions based on demand forecasting.
- Understand various types of cost concepts.
- Understand different kinds of market structures.
- Be familiar with accounting concepts & conventions.
- Understand the importance of capital budgets in decision making.
- Analyse financial statements through ratio analysis.

### PART - A

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on DC with Resistive load.
3. Experimental determination of Thevenin's theorem.
4. Magnetization characteristics of D.C. Shunt generator.
5. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
6. Brake test on DC shunt motor. Determination of performance Characteristics.
7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors).
8. Brake test on 3-phase Induction motor (performance characteristics).

### PART - B

1. PN Junction Diode Characteristics (Forward bias, Reverse bias)
2. Zener Diode Characteristics
3. Transistor CE Characteristics (Input and Output)
4. Rectifier without Filters (Full wave & Half wave)
5. Rectifier with Filters (Full wave & half wave)

**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
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**B.TECH (IT)**

**II YEAR I SEM**

**DATA STRUCTURES LAB THROUGH C++**

**Objectives:**

- To teach recursion and designing of algorithms using recursion.
- To explain sorting algorithms including bubble sort, insertion sort, quick sort, merge sort.
- To explain searching methods including, linear search, binary search and Fibonacci search.
- To master the implementation of elementary data structures such as linked lists, stacks, queues, binary trees and binary search trees.
- To familiar with the implementation of some graph algorithms such as graph traversals, shortest path and minimum spanning tree.

**Outcomes:**

- Be able to understand recursion and design algorithms using recursion.
- Be able to understand several sorting algorithms including bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort and radix sort.
- Be able to understand several searching methods including linear search, binary search and Fibonacci search
- Be able to understand the implementation of elementary data structures such as linked lists, stacks, queues, binary trees and binary search trees.
- Be to understand the implementation of advanced data structures such as balanced search trees, priority queues and the set data structures.
- Be to understand the implementation of some graph algorithms such as graph traversals, shortest path and minimum spanning tree

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

**Week1 :**

Write C++ programs to implement the following using an array.

- a) Stack ADT b) Queue ADT

**Week2 :**

Write C++ programs to implement the following using a singly linked list.

- a) Stack ADT b) Queue ADT

**Week3 :**

Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

**Week 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.

**Week5 :**

.Write C++ programs that use recursive functions to traverse the given binary tree in

- a) Preorder b) inorder and c) postorder.

**Week6 :**

.Write C++ programs that use non-recursive functions to traverse the given binary tree in

- b) Preorder b) inorder and c) postorder.

**Week7 :**

Write C++ programs for the implementation of bfs and dfs for a given graph.

**Week8 :**

Write C++ programs for implementing the following sorting methods:

- a) Merge sort
- b) Heap sort

**Week9 :**

Write a C++ program to perform the following operations

- a) Insertion into a B-tree
- b) Deletion from a B-tree

**Week10 :**

Write a C++ program to perform the following operation

- a) Insertion into an AVL-tree

**Week11 :**

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

**Week12 :**

Write a C++ program for implementing Knuth-Morris-Pratt pattern matching algorithm.

**(Note: Use Class Templates in the above Programs)**

**TEXT BOOKS :**

1. Data Structures A Pseudocode Approach with C++, India Edition, R.F.Gilberg and B.A.Forouzan,Cengage Learning.
2. Programming Principles and Practice using C++, B.Stroustrup,Addison-Wesley(Pearson education).
3. Data Structures and STL, W.J.Collins,Mc Graw Hill,International edition.
4. Data structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley& sons.
5. The Art,Philosophy, and Science of OOP with C++,Rick Miller,SPD.
6. C++ for Programmers,P.J.Deitel and H.M.Deitel,PHI/Pearson.

**PRINCIPLES OF PROGRAMMING LANGUAGES**

**Objectives:**

- To master syntax related concepts including context - free grammars, parse trees, recursive descent parsing, printing, and interpretation.
- To master analyzing semantic issues associated with function implementations, including variable binding, scoping rules, parameter passing, and exception handling.
- To familiar with design issues of object - oriented and functional languages.
- To familiar with language abstraction constructs of classes, interfaces, packages, and procedures.
- To expose to logic languages.

**Outcomes:**

- Master syntax related concepts including context - free grammars, parse trees, recursive descent parsing, printing, and interpretation.
- Master analyzing semantic issues associated with function implementations, including variable binding, scoping rules, parameter passing, and exception handling.
- Be familiar with design issues of object - oriented and functional languages.
- Be familiar with language abstraction constructs of classes, interfaces, packages, and procedures.
- Be exposed to logic 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.

Scripting Language: Pragmatics, Key Concepts, Case Study : Python – Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

### **TEXT BOOKS:**

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

### **REFERENCE BOOKS:**

1. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C.Louden, 2nd Edition, Thomson,2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin,& C.S.Mellish, 5th Edition, Springer.
5. Programming Python, M.Lutz, 3rd Edition, O'reilly,SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michael Dawson, Thomson, 2008.

**DATABASE MANAGEMENT SYSTEMS**

**Objectives:**

- To expose to the basic principles of database management systems.
- To explain database design using ER diagrams.
- To teach Relational Algebra, and Relational Calculus
- To familiar with SQL.
- To explain Transaction management, Crash Recovery and Concurrency Control.

**Outcomes:**

- Understand the basic principles of database management systems.
- Understand database design using ER diagrams.
- Learn Relational Algebra, and Relational Calculus
- Be familiar with SQL.
- Understand Transaction management.
- Gain knowledge on Crash Recovery and Concurrency Control.

**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

**UNIT II :**

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 III :**

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

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

**UNIT V :**

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 VI :**

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

**UNIT VII :**

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

**UNIT VIII :**

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

**TEXT BOOKS :**

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

**REFERENCES :**

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V.Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M.L. Gillenson, Wiley Student Edition.

**OBJECT ORIENTED PROGRAMMING**

**Objectives:**

- To familiar with constructors and string handling functions
- To explain Inheritance and Polymorphism
- To familiar with Packages and Interfaces
- To familiar with Exception handling and Multithreading
- To familiar with Applet Programming, Event Handling and scripting.

**Outcomes:**

- Be familiar with constructors and string handling
- Able to understand Inheritance and Polymorphism
- Be able to understand Packages and Interfaces
- Be able to understand Exception handling and Multithreading
- Be able to understand Applet Programming
- Be able to implement Event Handling

**UNIT I :**

**Object oriented thinking** :- Need for oop paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of oop concepts, coping with complexity, abstraction mechanisms.

**UNIT II :**

**Java Basics** History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, exploring string class.

**UNIT III :**

**Inheritance** – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, 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.  
Exploring java.io.

**UNIT V :**

**Exception handling** - Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.  
String handling, Exploring java.util

**UNIT VI :**

**Multithreading**- Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads.  
Enumerations, autoboxing, annotations , generics.

## **UNIT VII :**

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

The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – border, grid, flow, card and grid bag.

## **UNIT VIII :**

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

**Swing** – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

## **TEXT BOOKS :**

1. Java; the complete reference, 7<sup>th</sup> editon, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, pearson education.

## **REFERENCES :**

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.
2. An Introduction to OOP, third edition, T. Budd, pearson education.
3. Introduction to Java programming , Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education
7. Object Oriented Programming with Java, R.Buyya,S.T.Selvi,X.Chu,TMH.
8. Java and Object Orientation, an introduction, John Hunt, second edition, Springer.
9. Maurach's Beginning Java2 JDK 5 , SPD.
10. Programming and Problem Solving with Java, JM Slack, B S Publications.

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**B.TECH (IT)**

**II YEAR II SEM**

**ENVIRONMENTAL STUDIES**

**Objectives:**

- Natural resources provide the base on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources.
- Biodiversity raises an appreciation and deeper understanding of species, ecosystems and the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity.
- A methodology for identification, assessment and quantification of global environmental issues. Create awareness about the international conventions for mitigating global environmental problems.
- Sustainable development aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come
- Green environmental issue provides an opportunity to overcome the current global environmental issues by implementing modern techniques like CDM, green building ,green computing etc.

**Outcomes:**

- Apply Knowledge regarding environment and its components.
- Understand various ecosystems, their biodiversity and Scientific methods to protect them.
- Comprehend different types of pollutions and their control measures.
- Enhance their ability for effective methods of waste management.
- Understand about global environmental problems and come out with best possible solutions.
- Increase Knowledge about Green environmental issues.
- Create awareness about environmental laws, Environmental Impact assessments.

**UNIT-I: ECOSYSTEMS:** Concept of ecosystem, Classification of ecosystem, Functions of ecosystem, Food chains, Food webs and ecological pyramids, Flow of energy, Biogeochemical cycles, Biomagnification, carrying capacity.

**UNIT-II: NATURAL RESOURCES:** Classification of Resources: Living and Non-Living resources, Renewable and Non-Renewable resources. Water resources: use and over utilization, Land resources, land degradation, Forest resources, Mineral resources uses. Energy resources: growing energy needs, use of alternate energy sources-case studies. Environmental effects due to exploitation of various resources.

**UNIT-III: BIODIVERSITY AND BIOTIC RESOURCES:** Species, ecosystem diversity, Hotspots, Value of biodiversity, Threats to biodiversity, Conservation of biodiversity: In-Situ and Ex-Situ conservation, Biological disasters, pandemic and epidemics, Biological warfare.

**UNIT-IV: ENVIRONMENTAL POLLUTION AND CONTROL:** Classification of pollutions and pollutants, causes, effects of water, air, noise pollution, Introduction to control technologies: Water (primary, secondary, tertiary), Air(particulate and gaseous emissions), Soil(conservation and remediation), Noise(controlling devices) Solid waste : types, collection and disposal methods, characteristics of e-waste and its management.

**UNIT-V: GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS:** Green house effect, Green House Gases(GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances(ODS). Deforestation and desertification, International conventions/protocols: Earth Summit, Kyoto Protocol and Montreal Protocol, green-belt-development, Concept of Green Building, Clean Development Mechanism(CDM).

**UNIT-VI: ENVIRONMENTAL IMPACT ASSESSMENT (EIA) AND ENVIRONMENTAL MANAGEMENT**

**PLAN:** definition of Impact, classification of impacts, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society. Prediction of impacts and impact assessment methodologies. Environmental Impact Statement (EIS). Environmental management plan (EMP).

**UNIT-VII: ENVIRONMENTAL POLICY, LEGISLATION, RULES AND REGULATIONS:** National Environmental Policy, Environmental Protection Act, Legal aspects, Air (Prevention and control of pollution) Act-1981, Water (Prevention and control of pollution) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, solid waste ( biomedical waste and hazardous waste)management and handling rules.

**UNIT-VIII: TOWARDS SUSTAINABLE FUTURE:** Concept of Sustainable Development, Threats to Sustainability, Strategies for achieving Sustainable development, Environmental Ethics, Environmental Economics, Concept of Green Computing, Green chemistry and low Carbon life styles..

**TEXT BOOKS:**

1. TEXT BOOK OF ENVIRONMENTAL Science and Technology by M.Anji Reddy 2007
2. Principles of Environmental Science and Engineering by P.Venugopal Rao
3. Introduction to Environmental Studies by K.Mukkanti

**REFERENCE BOOKS:**

1. Tata McgrawHill : Introduction to Environmental Studies by Benny Joseph
2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press

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**B.TECH (IT)**

**II YEAR II SEM**

**PROBABILITY AND STATISTICS**

**Objectives:**

- To learn the concepts of discrete and continuous random variables.
- To know the various distributions like Binomial, Poisson and Normal.
- To learn sampling theory.
- To learn principles of hypothesis testing, inferences about population.
- To learn queuing theory and models.
- To find connection between probability & statistics to engineering subjects.

**Outcomes:**

- Set up probability models for a range of random phenomena, both discrete and continuous.
- Solve problems using probability
- Apply the notions of conditional probability.
- Recognize where the use of certain standard probability distributions would be appropriate.
- Appropriately apply a range of statistical tests.
- Solve different Queuing models

**UNIT-I : Probability:**

Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem, Random variables – Discrete and continuous.

**UNIT-II: Distributions**

Binomial , Poisson & normal distributions related properties . Sampling distributions –Sampling distribution of means ( $\sigma$  known and Unknown)

**UNIT-III: Testing of Hypothesis I**

Tests of hypothesis point estimations – interval estimations Bayesian estimation. Large samples, Null hypothesis – Alternate hypothesis type I, & type II errors – critical region confidential interval for mean testing of single variance. Difference between the mean.

**UNIT-IV : Testing of Hypothesis II**

Confidential interval for the proportions. Tests of hypothesis for the proportions single and difference between the proportions.

**UNIT-V: Small samples**

Confidence interval for the t- distribution – Tests of hypothesis – t- distributions, F- distributions  $\chi^2$  distribution. Test of Hypothesis.

**UNIT-VI: Correlation & Regression**

Coefficient of correlation – Regression Coefficient – The lines of regression – The rank correlation

**UNIT-VII: Queuing Theory**

Arrival Theorem - Pure Birth process and Death Process M/M/1 Model . MATLAB/R Introduction.

**UNIT-VIII: Stochastic processes**

Introduction to Stochastic Processes – Markov process classification of states – Examples of Markov Chains, Stochastic Matrix, limiting probabilities.

**TEXT BOOKS:**

1. Probability & Statistics by T.K.V.Iyengar & B.Krishna Gandhi & Others, S.Chand.
2. Engineering Mathematics By B.V.Ramana, Tata Mc.Grawhill Publications
3. Introduction to MATLAB by RudraGupta

**REFERENCES:**

1. Higher Engineering Mathematics by B.S. Grewal, Khanna Publications.
2. Advanced Probability and Statistics by S.C.Gupta and V.K.Kapoor
3. Higher Engineering Mathematics by Jain & S.K.R. Iyengar, Narasa Publications.
4. A first course in Probability & Statistics by B.L.S. Prakasa Rao, World Scientific.
5. Probability & Statistics for Engineers, Miller and John E. Freund, Prentice Hall of India.
6. Probability & Statistics by D.K. Murugesan & P.Guru Swamy, Anuradha Publications.
7. Probability & Statistics for Engineers by G.S.S.Bhisma Rao, Scitech Publications



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**B.TECH (IT)**

**II YEAR II SEM**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**Objectives:**

- To gain knowledge on time complexity and space complexity and learn asymptotic notations to express time and space complexities.
- To understand union and find algorithms connected components and bi-connected components.
- Master divide and conquer method and can apply this to solve some sorting and searching problems.
- Be familiar with greedy and dynamic programming.
- Gain knowledge on back tracking and can apply this to solve n-queens problem, sum of subsets problem, graph coloring problem and Hamiltonian cycles problems.
- Gain knowledge on branch and bound can apply this to solve TSP and 0/1 knapsack problem.
- Gain knowledge on P, NP, NP-hard and NP-complete class of problems.

**Outcomes:**

- Gain knowledge on time complexity and space complexity and learn asymptotic notations such as big oh, omega, and theta notations.
- Understand union and find algorithms, connected components and bi-connected components.
- Master divide and conquer method and can apply this to solve some sorting and searching problems.
- Be familiar with greedy method and dynamic programming can apply these to solve variety of problems.
- Gain knowledge on back tracking and can apply this to solve n-queens problem, sum of subsets problem, graph coloring problem and Hamiltonian cycles problems.
- Gain knowledge on branch and bound can apply this to solve TSP and 0/1 knapsack problem.
- Gain knowledge on P, NP, NP-hard and NP-complete class of problems.

**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 :**

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

**UNIT III :**

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

**UNIT IV :**

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

**UNIT V :**

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 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 NPComplete classes, Cook's theorem.

**TEXT BOOKS :**

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Design and Analysis Algorithms - Parag Himanshu Dave, Himanshu Bhalchandra Dave Publisher: Pearson
3. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John wiley and sons.

**REFERENCES :**

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

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**B.TECH (IT)**

**II YEAR II SEM**

**OBJECT ORIENTED PROGRAMMING LAB**

**Objectives:**

- To make students write Java programs using arithmetic operators ,control statements, type conversion ,constructors and string handling
- To explain how to write Java programs using Inheritance and Polymorphism
- To explain how to write Java programs for creation of user defined Packages and Interfaces
- To familiar with Exception handling, Multithreading and Event Handling
- To explain how to write Java programs using Applets

**Outcomes:**

- Be able to write Java programs using arithmetic operators ,control statements, type conversion ,constructors and string handling
- Be able to write Java programs for Inheritance and Polymorphism
- Be able to write Java programs for creation of user defined Packages and Interfaces
- Be able to write Java programs for Exception handling and Multithreading
- Be able to write Java programs for creation of Applets
- Be able to write Java programs for Event Handling

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- JDK Kit. Recommended

**Week1 :**

- a) 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.
- b) 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.

**Week 2 :**

- a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
- b) Write a Java program to multiply two given matrices.
- c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

**Week 3 :**

- a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
- b) Write a Java program for sorting a given list of names in ascending order.
- c) Write a Java program to make frequency count of words in a given text.

**Week 4 :**

- a) Write a Java program that reads a 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.
- b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- c) Write a Java program that displays the number of characters, lines and words in a text file.

**Week 5 :**

- a) Write a Java program that:
  - i) Implements stack ADT.
  - ii) Converts infix expression into Postfix form
  - iii) Evaluates the postfix expression

**Week 6 :**

- a) Develop an applet that displays a simple message.
- b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

**Week 7 :**

Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, \*, % operations. Add a text field to display the result.

**Week 8 :**

- a) Write a Java program for handling mouse and key events.

**Week 9 :**

- a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
- b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

**Week 10 :**

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

**Week 11 :**

- a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
- b) Write a Java program that allows the user to draw lines, rectangles and ovals.

**Week 12 :**

- a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides ( ) that shows the number of sides in the given geometrical figures.
- b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component.

**TEXT BOOKS :**

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Programming with Java, M.P.Bhave and S.A.Patekar, Pearson Education
3. Big Java, 2<sup>nd</sup> edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.
4. Introduction to Programming with Java, J.Dean & R.Dean, McGraw Hill education.
5. Java Programming, D S Malik, cengage learning, India Edition.

6. Object Oriented Programming through Java, P. Radha Krishna, Universities Press.
7. Essentials of Java Programming, Muthu.C, TMH.
8. Advanced Programming in Java 2, K. Somasundaram, Jaico.
9. The Art, Philosophy, and Science of OOP with Java, R. Miller, R. Kasparian, SPD.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

II YEAR II SEM

## DATABASE MANAGEMENT SYSTEMS LAB

### Objectives:

- To master SQL commands including DDL and DML commands.
- To explain how to add, modify and drop constraints to database.
- To familiar with sub queries and co related queries.
- To familiar with triggers, cursors and exceptions.
- To familiar with PL/SQL.

### Outcomes:

- Master SQL commands for creation and alteration of database tables.
- Understand how to add, modify and drop constraints to the database.
- Be familiar with sub queries and co related queries.
- Be familiar with triggers, cursors and exceptions and can apply these to the database.
- Be familiar with PL/SQL.

### Roadway Travels

"Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to *computerize its operations* in the following areas:

- Reservations and Ticketing
- Cancellations

### Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of *computerization* of **Roadway Travels** you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above process involves many steps like 1. Analyzing the problem and identifying the Entities and Relationships, 2. E-R Model 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. *Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels.* Examples are given at every experiment for guidance to students.

### Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example: **Entities:**

1. BUS
2. Ticket
3. Passenger

### Relationships:

1. Reservation
2. Cancellation

### PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus\_NO (Bus Entity)

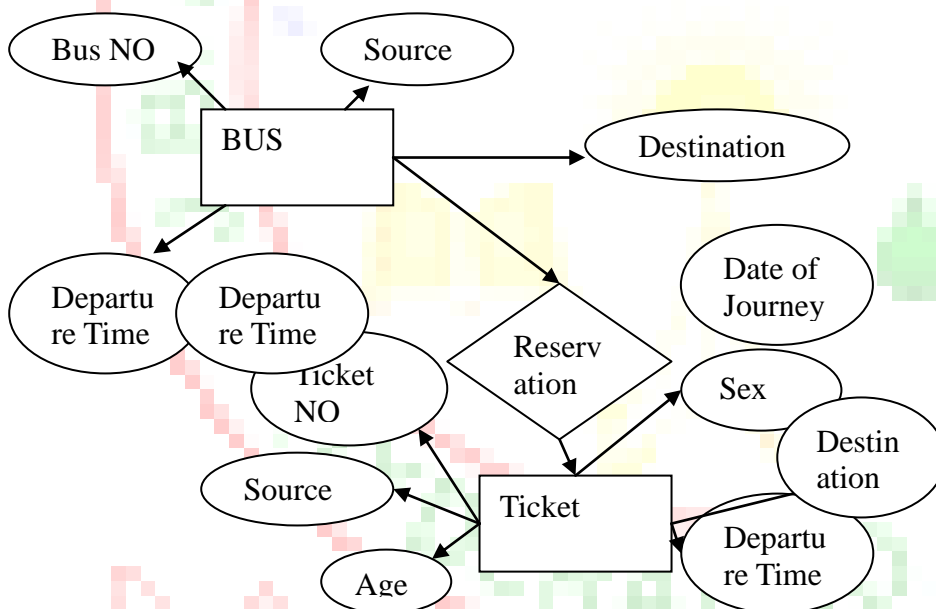
Apart from the above mentioned entities you can identify more. The above mentioned are few.

**Note:** The student is required to submit a document by writing the Entities and Keys to the lab teacher.

### Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

#### Example: E-R diagram for bus



**Note:** The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

### Experiment 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example: The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.

Passenger

Name	Age	Sex	Address	Ticket_id	<u>Passport ID</u>

**Note:** The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

#### Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket\_id and place it in another table along with the primary key of passenger.

**First Normal Form:** The above table can be divided into two tables as shown below.

Passenger

Name	Age	Sex	Address	<u>Passport ID</u>

<u>Passport ID</u>	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

#### Experiment 5: Installation of Mysql and practicing DDL commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger (
  Passport_id INTEGER PRIMARY KEY,
  Name VARCHAR (50) Not NULL,
  Age Integer Not NULL,
  Sex Char,
  Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

**Note:** Detailed creation of tables is given at the end.

## Experiment 6: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

### Inserting values into “Bus” table:

```
Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabad', 'Banglore');
Insert into Bus values (23,'hyderabad', 'Kolkata');
Insert into Bus values (45,'Tirupathi', 'Banglore');
Insert into Bus values (34,'hyderabad', 'Chennai');
```

### Inserting values into “Passenger” table:

```
Insert into Passenger values (1, 45,'ramesh', 45,'M', 'abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F', 'abc124');
Insert into Passenger values (45, 90,'ram', 30,'M', 'abc12');
Insert into Passenger values (67, 89,'ravi', 50,'M', 'abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F', 'abc55');
```

### Few more Examples of DML commands:

```
Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;
```

## Experiment 7: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

### Practice the following Queries:

1. Display unique PNR\_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

## Experiment 8 and Experiment 9: Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables. **Hint:** Use UNION Operator.
2. Display the number of days in a week on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR\_no using GROUP BY CLAUSE. **Hint:** Use GROUP BY on PNR\_No.
4. Find the distinct PNR numbers that are present.

5. Find the number of tickets booked by a passenger where the number of seats is greater than 1. **Hint:** Use GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.

### Experiment 10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: **CREATE TRIGGER updcheck BEFORE UPDATE ON passenger FOR EACH ROW BEGIN IF NEW.TickentNO > 60 THEN SET New.Tickent no = Ticket no; ELSE SET New.Ticketno = 0; END IF; END;**

### Experiment 11: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: **CREATE PROCEDURE myProc() BEGIN SELECT COUNT(Tickets) FROM Ticket WHERE age>=40; End;**

### Experiment 12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done

```
CREATE PROCEDURE myProc(in_customer_id INT)
BEGIN
DECLARE v_id INT;
DECLARE v_name VARCHAR(30);
DECLARE c1 CURSOR FOR SELECT stdId,stdFirstname FROM students WHERE stdId=in_customer_id;
OPEN c1;
FETCH c1 into v_id, v_name;
Close c1;
END;
```

### Tables

#### **BUS**

Bus No: Varchar: PK (public key)  
Source : Varchar  
Destination : Varchar

#### **Passenger**

PPNO: Varchar(15)) : PK  
Name: Varchar(15)  
Age : int (4)

Sex:Char(10) : Male / Female  
Address: VarChar(20)

### **Passenger\_Tickets**

PPNO: Varchar(15)) : PK  
Ticket\_No: Numeric (9)

### **Reservation**

PNR\_No: Numeric(9) : FK  
Journey\_date : datetime(8)  
No\_of\_seats : int (8)  
Address : Varchar (50)  
Contact\_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer  
Status: Char (2) : Yes / No

### **Cancellation**

PNR\_No: Numeric(9) : FK  
Journey\_date : datetime(8)  
No\_of\_seats : int (8)  
Address : Varchar (50)  
Contact\_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer  
Status: Char (2) : Yes / No

### **Ticket**

Ticket\_No: Numeric (9): PK  
Journey\_date : datetime(8)  
Age : int (4)  
Sex:Char(10) : Male / Female  
Source : Varchar  
Destination : Varchar  
Dep\_time : Varchar

### **REFERENCE BOOKS:**

- 1.Introduction to SQL,Rick F.Vander Lans,Pearson education.
- 2.Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearson education.
- 3.Oracle PL/SQL Programming,Steven Feuerstein,SPD.
- 4.SQL & PL/SQL for Oracle 10g,Black Book,Dr.P.S.Deshpande,Dream Tech.
- 5.Oracle Database 11g PL/SQL Programming,M.Mc Laughlin,TMH.
- 6.SQL Fundamentals,J.J.Patrick,Pearson Education.

**AUTOMATA AND COMPILER DESIGN**

**Objectives:**

- To describe the design of a compiler including its phases and components.
- To design lexical analyzers based on finite-state automata.
- To design top-down parsers based on push-down machines.
- To design a recursive-descent parser for any given LL (1) grammar.
- To design code generation algorithms using DAG.

**Outcomes:**

- Able to describe the design of a compiler including its phases and components.
- Able to design lexical analyzers based on finite-state automata.
- Able to design top-down parsers based on push-down machines.
- Able to design a recursive-descent parser for any given LL (1) grammar.
- Able to design code generation algorithms using DAG.

**UNIT-I**

**Formal Language and Regular Expressions** : Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.

**UNIT-II**

**Context Free grammars and parsing** : Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

**UNIT-III**

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

**UNIT-IV**

**Semantics** : Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

**UNIT-V**

Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

**UNIT-VI**

**Run time storage** : Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

**UNIT-VII**

**Code optimization** : Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

**UNIT-VIII**

**Code generation** : Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

**TEXT BOOKS :**

1. Introduction to Theory of computation.Sipser,2nd Edition,Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

**REFERENCES :**

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Cengage Learning.
3. Elements of Compiler Design,A.Meduna,Auerbach Publications,Taylor and Francis Group.
4. Principles of Compiler Design,V.Raghavan,TMH.
5. Engineering a Compiler,K.D.Cooper,L.Torczon,ELSEVIER.
6. Introduction to Formal Languages and Automata Theory and Computation – Kamala Krithivasan and Rama R, Pearson.
7. Modern Compiler Design,D.Grune and others,Wiley-India.
8. A Text book on Automata Theory,S.F.B.Nasir,P.K.Srimani,Cambridge Univ. Press.
9. Automata and Languages,A.Meduna,Springer.



**LINUX PROGRAMMING**

**Objectives:**

- To understand the LINUX system structure.
- To understand and use command line shell.
- To make effective use of Unix utilities and Shell scripting language such as bash.
- To produce programs similar to standard unix utilities such as ls, mv, cp etc. using Unix system calls.
- To develop the skills necessary for Unix systems programming including file system programming, process and signal management, and interprocess communication.
- To develop the basic skills required to write network programs using Sockets.

**Outcomes:**

- Work confidently in Linux environment.
- Work with shell script to automate different tasks as Linux administration

**UNIT - I**

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

**UNIT- II**

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

**UNIT - III**

Files: File Concept, File System Structure, Inodes, File Attributes, File types, Library functions,the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

**UNIT - IV**

Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

**UNIT - V**

Interprocess Communication : Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory.

Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.

**UNIT-VI**

Semaphores-Kernel support for semaphores, Unix system V APIs for semaphores.

Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

## **UNIT -VII**

Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with semaphores and with Mutexes, Example programs.

## **UNIT-VIII**

Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

### **TEXT BOOKS:**

1. Unix System Programming using C++, T.Chan, PHI.(UNIT III to UNIT VIII)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Beginning Linux Programming, 4<sup>th</sup> Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition.

### **REFERENCE BOOKS:**

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2<sup>nd</sup> Edition, W.R.Stevens, Pearson Education.
3. Unix Network Programming, W.R.Stevens, PHI.
4. Unix for programmers and users, 3<sup>rd</sup> Edition, Graham Glass, King Ables, Pearson Education.
5. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
6. Unix The Text book, 2<sup>nd</sup> edition, S.M.Sarwar, R.Koretsky, S.A.Sarwar, Pearson Education.
7. Unix Internals, U.Vahalia, Pearson Education.
8. Unix shell Programming, S.G.Kochan and P.Wood, 3<sup>rd</sup> edition, Pearson Education.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

III YEAR I SEM

## SOFTWARE ENGINEERING

### Objectives:

- Understanding of software process models such as waterfall and evolutionary models.
- Understanding of software requirements and SRS document.
- Understanding of different software architectural styles.
- Understanding of software testing approaches such as unit testing and integration testing.
- Understanding on quality control and how to ensure good quality software.

### Outcomes:

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions
- Ability to critically thinking and evaluate assumptions and arguments.

### UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

### UNIT II

Process models: The waterfall model, Incremental process models, Evolutionary process models, Specialized 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, pattern based software design.

Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into a software architecture.

### UNIT V

Modeling component-level design: Designing class-based components, conducting component-level design, Object constraint language, designing conventional components.

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, Frame work for Product metrics, 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, RMMM, RMMM 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, sixth edition. McGrawHill International Edition, 2005
2. Software Engineering, Ian Sommerville, seventh edition, Pearson education, 2004.

### **REFERENCE BOOKS:**

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering : A Primer, Waman S Jawadkar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering 1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering 2: Specification of systems and languages, Diner Bjorner, Springer International edition , 2006.
7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.
8. Software Engineering Principles and Practice, Hans Van Vliet, 3<sup>rd</sup> edition, John Wiley & Sons Ltd.
9. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
10. Introduction to Software Engineering, R.J. Leach, CRC Press.

**OPERATING SYSTEMS**

**Objectives:**

- To understand the purpose and different types of operating systems.
- To distinguish between a resource, a program, and a process
- To explain different CPU scheduling algorithms
- To organize different directory structures.
- To understand deadlock prevention and avoidance.
- To recognize critical resources and explain the behavior of semaphores and monitors.
- To describe various memory management and page replacement algorithms.
- To describe how files are stored in secondary storage.

**Outcomes:**

- Understand the purpose of the operating system
- Distinguish between a resource, a program, and a process
- Explain different CPU scheduling algorithms
- Organize different directory structures.
- Understand deadlock prevention and avoidance.
- Recognite critical resources and explain the behavior of semaphores and monitors.
- Describe various memory page replacement algorithms
- Describe how files are stored in secondary storage

**UNIT - I**

**Operating Systems Overview-** Operating systems functions, Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures-operating system services and systems calls, system programs, operating system structure,operating systems generation

**UNIT - II**

**Process Management** – Process concepts, threads, scheduling-criteria, algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows

**UNIT - III**

**Concurrency** - Process synchronization, the critical- section problem, Peterson’s Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows

**UNIT - IV**

**Memory Management** - Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging,page-replacement,algorithms,Allocation of frames,Thrashing case studies UNIX, Linux, Windows

**UNIT - V**

**Principles of deadlock** – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

**UNIT - VI**

**File system Interface-** the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

**File System implementation-** File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

## UNIT - VII

**Mass-storage structure-** overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

**I/O systems-** Hardware, application I/o interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

## UNIT - VIII

**Protection -** Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection,

**Security-** The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows

### TEXT BOOKS :

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th edition, John Wiley.
2. Operating systems- A Concept based Approach-D.M.Dhamdhare, 2<sup>nd</sup> Edition, TMH

### REFERENCES :

1. Operating Systems – Internals and Design Principles, Stallings, sixth Edition–2009, Pearson education.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition PHI.
4. Principles of Operating Systems , B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, 2nd Edition, TMH
6. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
7. Operating Systems, G.Nutt, N.Chaki and S.Neogy, 3<sup>rd</sup> Edition, Pearson Education.
8. Operating Systems, R.Elmasri, A.G.Carrick and D.Levine, Mc Graw Hill.
9. Operating Systems, S.Haldar, A.A.Aravind, Pearson education.

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**B.TECH (IT)**

**III YEAR I SEM**

**COMPUTER NETWORKS**

**Objectives:**

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.

**Outcomes:**

- After this course students could understand and explore the basics of Computer Networks and Various Protocols. She/he will be in a position to understand the World Wide Web concepts.
- After this course he/she will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and ad hoc networks.

**UNIT I**

Introduction to networks, internet, protocols and standards, the OSI model, layers in OSI model, TCP/IP suite, Addressing, Analog and digital signals.

**UNIT II**

Physical Layer: digital transmission, multiplexing, transmission media, circuit switched networks, Datagram networks, virtual circuit networks, switch and Telephone network.

**UNIT III**

Data link layer: Introduction, Block coding, cyclic codes, checksum, framing, flow and error control, Noiseless channels, noisy channels, HDLC, point to point protocols

**UNIT IV**

Medium Access sub layer: Random access, controlled access, channelization, IEEE standards, Ethernet, Fast Ethernet, Giga-Bit Ethernet, wireless LANs.

**UNIT V**

Connecting LANs, backbone networks and virtual LANs, Wireless WANs, SONET, frame relay and ATM.

**UNIT VI**

Network Layer: Logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, forwarding, uni-cast routing protocols, multicast routing protocols.

**UNIT VII**

Transport Layer: Process to process delivery, UDP and TCP protocols, SCTP, data traffic, congestion, congestion control, QoS, integrated services, differentiated services, QoS in switched networks.

**UNIT VIII**

Application Layer – Domain name space, DNS in internet, electronic mail, FTP, WWW, HTTP, SNMP, multi-media, network security

**TEXT BOOKS:**

- 1.Data Communications and Networking – Behrouz A. Forouzan, Fourth Edition TMH,2006.
- 2.Computer Networks -- Andrew S Tanenbaum, 4th Edition, Pearson Education.

**REFERENCE BOOKS:**

1. An Engineering Approach to Computer Networks-S.Keshav,2nd Edition,Pearson Education
2. Understanding communications and Networks,3rd Edition, W.A.Shay,Cengage Learning.
3. Computer and Communication Networks ,Nader F. Mir, Pearson Education
4. Computer Networking:A Top-Down Approach Featuring the Internet,James F.Kurose,K.W.Ross,3<sup>rd</sup> Edition,Pearson Education.
5. Data and Computer Communications,G.S.Hura and M.Singhal,CRC Press,Taylor and Francis Group.
6. Data communications and computer Networks,P.C.Gupta,PHI.



**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

**Objectives:**

- To understand the concepts of managerial economics and financial analysis this helps in optimal decision making in business environment.
- To be familiar with demand concepts, types of methods or techniques of demand those are used by the entrepreneur or producer.
- To have a thorough knowledge on the production theories and cost while dealing with the production and factors of production.
- To understand the concepts of cost and significance, limitation of Break even analysis.
- An ability to understand the various pricing methods which are adopted in attracting the potential customers for the different commodities..
- To know the significance of the project management, capital budgeting, estimation of the projects through capital budgeting methods for choosing the best and optimal projects.
- To make the optimal decisions acquiring the knowledge on financial accounting and management accounting.

**Outcomes:**

- Managerial Economics deals with the economic activities performed by the businessmen
- It deals with the significance of demand, its analysis, measurement of demand and its forecasting
- It explains the production function through the Cobb Douglas Production Function.
- It introduces to the different structures of market covering how price is determined under different market structures.
- Different forms of business organisations existing in the modern business can be very well understood under its scope
- The allocation of capital which plays a vital role in a business organisation is learnt
- The double entry book keeping will give an exposure to the maintenance of books of records and allocation of profits in an enterprise.

**UNIT I Introduction to Managerial Economics:**

Definition, Nature and Scope of 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, Cobb-Douglas 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 Policies:**

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

**Objectives and Policies of Pricing- Methods of Pricing:** Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block

Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

**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 Profit Ratio, P/E Ratio and EPS).

**TEXT BOOKS:**

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

**REFERENCE BOOKS:**

1. Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2009.
2. V.Rajasekarn & R.Lalitha, Financial Accounting, Pearson Education, New Delhi, 2010.
3. Suma Damodaran, Managerial Economics, Oxford University Press, 2009.
4. Domnick Salvatore: Managerial Economics in a Global Economy, 4th Edition, Cengage, 2009.
5. Subhash Sharma & M P Vittal, Financial Accounting for Management, Text & Cases, Machmillan, 2008.
6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2008.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2009.
8. Dwivedi: Managerial Economics, Vikas, 2009.
9. M.Kasi Reddy, S.Saraswathi: Managerial Economics and Financial Accounting, PHI, 2007.
10. Erich A. Helfert: Techniques of Financial Analysis, Jaico, 2007.

**Prerequisites:** Nil

**Objective:** To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

**Codes/Tables:** Present Value Tables need to be permitted into the examinations Hall.

**Question Paper Pattern:** 5 Questions to be answered out of 8 questions .Out of eight questions 4 questions will be theory questions and 4 questions should be problems.  
Each question should not have more than 3 bits.

**OPERATING SYSTEMS& COMPUTER NETWORKS LAB (THROUGH LINUX)**

**Objectives:**

- To implement data link layer framing methods.
- To implement shortest path algorithm for sending packets for efficient utilization of band width.
- To create routing table for efficient transmission of packets.
- To familiar with shell programming
- To implement UNIX commands using system calls.
- To perform operations on files and directories.
- To implement inter process communication using pipes.

**Outcomes:**

- To implement data link layer framing methods.
- To implement shortest path algorithm for sending packets for efficient utilization of band width.
- To create routing table for efficient transmission of packets.
- To familiar with shell programming
- To implement UNIX commands using system calls.
- To perform operations on files and directories.
- To implement inter process communication using pipes.

**System/ Software Requirement**

Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space

**Computer Networks 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 art 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**

**Operating Systems Lab:**

1. Simulate the following CPU scheduling algorithms
  - a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
  - a) Sequentialb) 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.

## Problems on Linux Programming:

### Note: Use Bash for Shell scripts.

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a C program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Unix commands using System calls
  - a). cat
  - b) mv
12. Write a C program to list directory files in a directory.
13. Write a C program to emulate the Unix `ls -l` command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that redirects standard output to a file.Ex: `ls > f1`.
16. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- `ls -l | sort`
20. Write C programs that illustrate communication between two unrelated processes using named pipe.
21. Write a C program in which a parent writes a message to a pipe and the child reads the message.
22. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
23. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (22)) and displays them.
24. Write C programs to transfer a large amount of data between processes, using
  - a) a pipe
  - b) a FIFO
  - c) a message queue.

### REFERENCE BOOKS:

1. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education, 2005.
4. Unix Shells by Example, 4th Edition, Ellie Quigley, Pearson Education.
5. Sed and Awk, O.Dougherty&A.Robbins,2<sup>nd</sup> edition,SPD.

**ADVANCED ENGLISH COMMUNICATION SKILLS LAB**

**Objectives:**

- Knowledge of Functional English.
- Knowledge of Root-words so as to enable Vocabulary enhancement.
- To achieve a good competency as well as syntax in written English Skills.
- To develop good inter-personal relationship by enriching good conduct, etiquette and body language.
- To enable the students to face interviews with a high degree of success rate.

**Outcomes:**

- Students perform better in National and Global examinations.
- Students perform well during placements.
- Students adjust well to corporate life.

**1. Introduction**

The introduction of the English Language Lab is considered essential at 3<sup>rd</sup> year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

**2. Objectives:**

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

**3. Syllabus:**

The following course content is prescribed for the Advanced Communication Skills Lab:

- **Functional English** - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- **Vocabulary Building** – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- **Reading Comprehension** – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, Critical reading.
- **Writing Skills** – structure and presentation of different types of writing – *Resume writing / e-correspondence/Technical report writing/Portfolio writing* – planning for writing – *research abilities/data collection/organizing data/tools/analysis* – improving one's writing.
- **Group Discussion** – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars and written presentations through posters/projects/reports/PPTs/e-mails/assignments etc.
- **Interview Skills** – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.

#### 4. Minimum Requirement:

The English Language Lab shall have two parts:

- i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

#### System Requirement ( Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- iii) P – IV Processor
  - a. Speed – 2.8 GHZ
  - b. RAM – 512 MB Minimum
  - c. Hard Disk – 80 GB
- iv) Headphones of High quality

#### 5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

#### Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7<sup>th</sup> Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**( KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed,**
  - **Positive Thinking,**
  - **Interviewing Skills,**
  - **Telephone Skills,**
  - **Time Management**
  - **Team Building,**
  - **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

#### 6. Books Recommended:

1. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. **Advanced Communication Skills Laboratory Manual** by Sudha Rani, D, Pearson Education 2011.
3. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
4. **English Vocabulary in Use** series, Cambridge University Press 2008.
5. **Management Shapers Series** by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
6. **Communication Skills** by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
7. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
8. **Job Hunting** by Colm Downes, Cambridge University Press 2008.
9. **Master Public Speaking** by Anne Nicholls, JAICO Publishing House, 2006.
10. **English for Technical Communication for Engineering Students**, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.
11. Books on **TOEFL/GRE/GMAT/CAT/ IELTS** by Barron's/DELTA/Cambridge University Press.
12. **International English for Call Centres** by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

#### DISTRIBUTION AND WEIGHTAGE OF MARKS:

##### *Advanced Communication Skills Lab Practicals:*

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.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

III YEAR II SEM

## WEB TECHNOLOGIES

### Objectives:

- To learn the concept of developing advanced HTML pages with the help of frames, scripting languages, and evolving technology like DHTML, XML.
- To understand web site planning, designing, management and maintenance.
- To understand serve lets and JSP.
- To design dynamic web programming using java scripts.
- To implement business logic with java beans.

### Outcomes:

- Able to learn the concept of developing advanced HTML pages with the help of frames, scripting languages, and evolving technology like DHTML, XML.
- Students can understand web page site planning, management and maintenance.
- Understand serve lets and JSP.
- Be able to design dynamic web programming using java scripts.
- Helps students to solve industry-standard studios

### 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, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

### UNIT-V:

**Web Servers and Servlets:** Tomcat web server, Introduction to Servelets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servelet 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. Programming world wide web-Sebesta,Pearson
2. Java: the complete reference, 7<sup>th</sup> editon, Herbert Schildt, TMH.
3. Core SERVLETS ANDJAVA SERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 5,6,7,8)

**REFERENCE BOOKS:**

1. Web Programming, building internet applications, Chris Bates 2<sup>nd</sup> edition,WILEY Dreamtech
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
3. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
4. Murach's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to web Design and Programming –Wang-Thomson
6. Web Applications Technologies Concepts-Knuckles,John Wiley
7. Programming world wide web-Sebesta,Pearson
8. Web Warrior Guide to Web Programmig-Bai/Ekedaw-Thomas
9. Beginning Web Programming-Jon Duckett WROX.
10. Java Server Pages, Pekowsky, Pearson.



**OPERATIONS RESEARCH  
(OPEN ELECTIVE)**

**Objectives:**

- To introduce the methods of Operations Research.
- Emphasize the mathematical procedures of non linear programming search techniques.
- Introduce advanced topics such as Probabilistic models and dynamic programming.

**Outcomes:**

- Ability to understand the optimization methods and also learn where to use in computer programming.
- Ability to apply the OR methods in different domains like operating system, algorithms and etc.

**UNIT I**

Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem – Formulation of LPP, Graphical solution of LPP. Simplex Method, Artificial variables, big-M method, two-phase method, degeneracy and unbound solutions.

**UNIT II**

Transportation Problem. Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method.

**UNIT III**

Assignment model. Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Traveling salesman problem and assignment problem.

**UNIT IV**

Sequencing models. Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

**UNIT V**

Dynamic programming. Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

**UNIT VI**

Games Theory. Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. Solution of games with saddle points, dominance principle. Rectangular games without saddle point – mixed strategy for 2 X 2 games.

**UNIT VII**

Replacement Models. Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

**UNIT VIII**

Inventory models. Inventory costs. Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

**TEXT BOOKS:**

1. P. Sankara Iyer, "Operations Research", Tata McGraw-Hill, 2008.
2. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operations Research", Pearson Education, 2005.

**REFERENCE BOOKS:**

1. J K Sharma., "Operations Research Theory & Applications , 3e", Macmillan India Ltd, 2007.
2. P. K. Gupta and D. S. Hira, "Operations Research", S. Chand & co., 2007.
3. J K Sharma., "Operations Research, Problems and Solutions, 3e", Macmillan India Ltd.
4. N.V.S. Raju, "Operations Research", HI-TECH, 2002.
5. Panneerselvam, "Operations Research", PHI-2e, 2006, rp2008.
6. Operations Research,Ravindran,Phillips,Solberg,2<sup>nd</sup> edition,Wiley India.
7. Operations Research,W.L.Winston,4<sup>th</sup> edition,Cengage Learning.
8. Col. D. S. Cheema, "Operations Research", Laxmi Publications Ltd., 2005.
9. F.S. Hillier, G.J. Lieberman, "Introduction to Operations Research – 8ed", Tata McGraw-Hill, 2005, rp2007.
10. H.S. Kasana & K.D. Kumar, "Introductory Operations Research – Theory and applications", Springer, 2003, rp2005.
11. Billy E. Gillett, "Introduction to Operations Research – A Computer-Oriented Algorithmic Approach", Tata McGraw-Hill, 1979, rp2004.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

III YEAR II SEM

## INTELLECTUAL PROPERTY RIGHTS AND CYBER LAW (OPEN ELECTIVE)

### Objectives:

- To gain knowledge on intellectual property rights
- To learn the streamlined approach in Patent Filing

### Outcomes:

At the end of course the student will be able to:

- Understand the role of intellectual property rights
- Identify the main types of intellectual property rights
- Understand the steps for successful registration and protection of intellectual property rights at national, regional and international levels
- Search patent and trademark databases
- Understand the legal aspects for intellectual property protection

### **UNIT-I : Introduction to Intellectual Property, Law of Trademarks, Trademark Selection & Searching**

IP Law – Types of IP - Agencies for IP Registration – International Treaties. Purpose and Function of Trademarks – Types of marks – Acquisition of Trademark Rights – Categories of marks – Trade names and Business names – protectable matter. Selection and Evaluation of a mark - Trademark search.

### **UNIT-II: Trademark Registration Process, Post-registration Procedures, Trademark Maintenance, Transfer of Rights to Marks**

Preparing and Filing the Application - Docketing Critical Dates - Examination Process - Post-examination Procedure – Registration. Affidavit of Continued Use – Affidavit of Incontestability – Renewal of Registrations – Docketing Requirements – Loss of Trademark Rights – Trademark Use and Compliance Policies – Trademark Policing and Maintenance - Use of Marks Owned by Third Parties – Transfer of Ownership or Rights in Trademarks.

### **UNIT-III: Inter Partes Proceedings, Infringement, Dilution, New Developments in Trademark Law**

Inter Partes Proceedings – Infringement of Trademarks – Dilution of Trademarks – Related Trademark Claims. Protecting a Domain Name – Other Cyberspace Trademark issues.

### **UNIT-IV : Law of Copyright, Subject Matter Of Copyright, Rights Afforded by Copyright Law**

Foundations of Copyright Law – Originality of Material – Fixation of Material – Exclusions from Copyright Protection – Compilations, Collections, and Derivative Works. Rights of Reproduction – Rights to Prepare Derivative works – Rights of Distribution – Rights to Perform the Work Publicly – Rights to Display the Work Publicly – Limitations on Exclusive Rights.

### **UNIT-V: Copyright Ownership, Transfers, Duration, Registration, and Searching**

Copyright Ownership Issues – Joint works – Ownership in Derivative works – Works Made for hire – Transfers of Copyright – Termination of Transfers of Copyright – Duration of Copyright. Copyright Registration Application – Deposit Materials – Application Process and Registration of Copyright – Searching Copyright Office Records – Obtaining Copyright Office Records and Deposit Materials – Copyright Notice.

### **UNIT-VI: Copyright Infringement, New Developments in Copyright Law, Semiconductor Chip Protection Act**

Elements of Infringement – Contributory Infringement and Vicarious Infringement – Defenses to Infringement – Infringement Actions – Remedies for Infringement. Copyright Protection for Computer Programs – Copyright Protection for Automated Databases – Copyright in the Electronic Age – The Digital Millennium Copyright Act – Recent Developments in Copyright Law – Terms of the Trade – Vessel Hull Protection – Semiconductor Chip Protection.

### **UNIT-VII: Law of Patents, Patent Searches, Ownership, Transfer**

Patentability – Design Patents – Double Patenting – Patent Searching – Patent Application Process – Prosecuting the

Application, Post-issuance Actions, Term and Maintenance of Patents. Ownership Rights – Sole and Joint Inventors – Disputes over Inventorship – Inventions Made by Employees and Independent Contractors – Assignment of Patent Rights – Licensing of Patent Rights – Invention Developers and Promoters.

**UNIT-VIII: Patent Infringement, New Developments and International Patent Law**

Direct Infringement – Inducement to Infringe – Contributory Infringement – First Sale Doctrine – Claims Interpretation – Defenses to Infringement – Remedies for Infringement – Resolving an Infringement Dispute – Patent Infringement Litigation. New Developments in Patent Law – International Patent Protection – Paris Convention – Patent Cooperation Treaty – Agreement on Trade Related Aspects of Intellectual Property Rights – Patent Law Treaty.

**TEXT BOOK:**

1. Intellectual Property Rights by Deborah E. Bouchoux, Cengage Learning.

**REFERENCES:**

1. Managing Intellectual Property – The Strategic Imperative, Second Edition by Vinod V. Sople, PHI Learning Private Limited.
2. Intellectual Property – Copyrights, Trademarks, and Patents by Richard Stim, Cengage Learning



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B.TECH (IT)

III YEAR II SEM

## COMPUTER FORENSICS (OPEN ELECTIVE)

### Objectives:

This course is intended to provide students with greater depth of study in a number of key topics in the area of computer security in society: cybercrime, computer and forensics, analysis. The course also involves significant practical work involving the development and use of forensics analysis tools.

### Outcomes:

- Demonstrate a working knowledge of computers, storage devices, and digital data
- Explain the responsibilities and liabilities of a computer forensic investigator
- Plan and prepare for an incident requiring computer forensic skills
- Seize a computer from a crime scene without damaging it or risking it becoming inadmissible in a court of law
- Explain where digital evidence resides on computer storage devices
- Demonstrate basic skills with WinHex software for recovering digital evidence from computer storage devices
- Hire experts to perform detailed forensic analysis and expert testimony

### UNIT – I

**Computer Forensics Fundamentals:** What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists

**Types of Computer Forensics Technology:** Types of Military Computer Forensic Technology, Types of Law Enforcement – Computer Forensic Technology – Types of Business Computer Forensic Technology

### UNIT – II

**Computer Forensics Evidence and Capture:** Data Recovery Defined – Data Back-up and Recovery – The Role of Back-up in Data Recovery – The Data-Recovery Solution

**Evidence Collection and Data Seizure:** Why Collect Evidence? Collection Options – Obstacles – Types of Evidence – The Rules of Evidence – Volatile Evidence – General Procedure – Collection and Archiving – Methods of Collection – Artifacts – Collection Steps – Controlling Contamination: The Chain of Custody

### UNIT – III

**Duplication and Preservation of Digital Evidence:** Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collecting and Preserving Computer Forensic Evidence

**Computer Image Verification and Authentication:** Special Needs of Evidential Authentication – Practical Consideration – Practical Implementation

### UNIT – IV

**Computer Forensics analysis and validation:** Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

**Network Forensics:** Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

### UNIT – V

**Processing Crime and Incident Scenes:** Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

### UNIT – VI

**Current Computer Forensic tools:** evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software

### UNIT – VII

**E-Mail Investigations:** Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools  
**Cell phone and mobile device forensics:** Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

#### **UNIT – VIII**

**Working with Windows and DOS Systems:** understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

#### **TEXT BOOKS:**

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

#### **REFERENCE BOOKS:**

1. Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison- Wesley Pearson Education
2. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
3. Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
5. Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley India Edition.

**J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY**  
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**B.TECH (IT)**

**III YEAR II SEM**

**NETWORK SECURITY**

**Objectives:**

- To understand the importance and application of each of confidentiality, Integrity, authentication and availability
- To understand various cryptographic algorithms.
- To understand the basic categories of threats to computers and networks
- To understand public-key cryptosystem.
- To understand Intrusions and intrusion detection
- To understand the fundamental ideas of public-key cryptography.
- To generate and distribute a PGP key pair and use the PGP package to
- Send an encrypted e-mail message.
- To discuss web security and Firewalls

**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 - VII**

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.Manzuik and Ryan Permech, Wiley Dreamtech

**REFERENCES :**

1. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
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, Cengage Learning.
5. Cryptography and network Security, B.A. Forouzan, D. Mukhopadhyay, 2<sup>nd</sup> edition, TMH.
6. Introduction to Cryptography, Buchmann, Springer.
7. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
8. Information Systems Security, Godbole, Wiley Student Edition.
9. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

III YEAR II SEM

## COMPUTER GRAPHICS

### Objectives:

- To understand and practice basic design theory, page layout and graphic design principles.
- To understand and apply basic color theory, color interaction and human response to different colors.
- To utilize various graphics applications to solve different visual communication problems.
- To understand and use the basic software and hardware tools to use for various graphics problems and situations
- To recognize and evaluate critical and aesthetic issues within computer graphics
- To apply aesthetic judgments and critical thinking skills to art and graphics related issue

### Outcomes:

- Understand and practice basic design theory, page layout and graphic design principles.
- Understand and apply basic color theory, color interaction and human response to different colors.
- Utilize various graphics applications to solve different visual communication problems.
- Understand and use the basic software and hardware tools to use for various graphics problems and situations
- Recognize and evaluate critical and aesthetic issues within computer graphics
- Apply aesthetic judgments and critical thinking skills to art and graphics related issues

### 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

### 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.

### UNIT III

2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

### 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.

### 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.

### 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.

### 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

### UNIT VIII

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

**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.

**REFERENCE BOOKS:**

1. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc Graw hill edition.
2. "Procedural elements for Computer Graphics", David F Rogers, Tata Mc Graw hill, 2nd edition.
3. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
4. "Principles of Computer Graphics", Shalini, Govil-Pai, Springer.
5. "Computer Graphics", Steven Harrington, TMH
6. Computer Graphics, F.S.Hill, S.M.Kelley, PHI.
7. Computer Graphics, P.Shirley, Steve Marschner & Others, Cengage Learning.
8. Computer Graphics & Animation, M.C.Trivedi, Jaico Publishing House.
9. An Integrated Introduction to Computer Graphics and Geometric Modelling, R.Goldman, CRC Press, Taylor & Francis Group.
10. Computer Graphics, Rajesh K. Maurya, Wiley India.



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B.TECH (IT)

III YEAR II SEM

## DATA WAREHOUSING AND DATA MINING (ELECTIVE – I)

### Objectives:

- To teach data warehousing and OLAP technology
- To provide an overview of data preprocessing techniques.
- To familiar with different data mining techniques such as characterization, comparison, classification.
- To provide an overview of mining complex types of data

### Outcomes:

- Understand data warehousing and OLAP technology
- be able to design a data warehouse for an organization
- be able to understand and apply data mining techniques such as characterization, comparison, association, classification.
- Gain knowledge on mining complex types of data.

### UNIT I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

### UNIT II

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

Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

### UNIT III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining

### UNIT IV

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

### Unit V

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

### UNIT VI

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis and Multirelational Data Mining:

### UNIT VII

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

## UNIT VIII

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining and Social Impacts of Data Mining.

### TEXT BOOKS:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2<sup>nd</sup> Edition, 2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

### REFERENCE BOOKS:

1. Data Mining Techniques – Arun K Pujari, 2<sup>nd</sup> edition, Universities Press.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining, K.P.Soman, S.Diwakar, V.Ajay, PHI, 2008.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley student Edition
5. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley student edition
6. Building the Data Warehouse By William H Inmon, John Wiley & Sons Inc, 2005.
7. Data Mining Introductory and advanced topics –Margaret H Dunham, Pearson education
8. Data Mining, V.Pudi and P.Radha Krishna, Oxford University Press.
9. Data Mining: Methods and Techniques, A.B.M Shawkat Ali and S.A.Wasimi, Cengage Learning.
10. Data Warehouse 2.0, The Architecture for the next generation of Data Warehousing, W.H.Inmon, D.Strauss, G.Neushloss, Elsevier, Distributed by SPD.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

III YEAR II SEM

## EMBEDDED SYSTEMS

### Objectives:

- To explain various embedded system applications and design requirements.
- To construct embedded system hardware.
- To develop software programs to control embedded system.
- To generate product specification for embedded system.

### UNIT - I

**Embedded Computing** : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. **(Chapter I 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, HardReal-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, I2C 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, Elseveir.
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 Deshmukhi, 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.



**EMBEDDED SYSTEMS AND DATA MINING LAB**

**EMBEDDED SYSTEMS LAB:**

( Using 89c51 SDK (Software Development Kit))

**EXP 1 .**Write a program to

- a) Read inputs from switches from 89c51 SDK
- b) And blink the LED's in different patterns in 89c51 SDK .

**EXP 2.** Write a Program for serial Communication between Microcontrollers to PC vice versa

- For Microcontroller to PC communication the data should be transferred from microcontroller to PC Terminal window .
- For PC to microcontroller communication the data should be transferred from PC terminal window to Microcontroller LCD display.

**EXP 3.** Write a Program for Encryption and Decryption.

- Use 4x3 keyboard interface (for enter data)
- Use LCD interface (display data)
- Use serial Communication (display data at PC terminal window)

**EXP 4.** Develop necessary interfacing circuit to read data from a temperature sensor and process using 89c51 SDK , the data has to be displayed on a PC Terminal window.

**EXP 5.** Sort RTOS on to 89c51 Microcontroller and verify.

- Run 2 to 3 tasks simultaneously on 89c51 SDK
- Use LCD interface ,LED interface, Serial communication.

**EXP 6.** Write a program to read input from switches display the switch number in seven segment display and Develop necessary interfacing circuit to process display . (example : if we press switch 1 it should display 1 on the seven segment display)

**EXP 7.** Write a program to read input from switches and turn on bulb which can works With 230 V AC using relay interface , develop necessary interfacing circuit for 89c52SDK. (example : if we press switch 1 it should turn on bulb 1 vice versa)

**EXP 8.** Write a program to to display Real time Clock on SEVEN SEGMENT DISPLAY and Develop necessary interfacing circuit to process TIME display .

**EXP 9.** Write a program to implement calculator which can execute basic operations such as addition , subtraction, multiplication and division and develop necessary interfacing circuit for process the operations with 89c52 SDK.

- Use Keyboard Interface (for read input from user)
- Use 2-line LCD Interface (for display the input and display the output)

**REFERENCES:**

- 1) KVKKF Prasad : Embedded /Real-Time Systems , Dreamtech,Press.
- 2) The 8051 micro controller & Embedded Systems using assembly and C By Kenneth J.Ayala Dhananjay V.Gadre

**Data Mining Lab:**

**Data Mining Lab:**

**Objectives:**

- Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.
- To obtain practical experience using data mining techniques on real world data sets.
- Emphasize hands-on experience working with all real data sets.

- Understand various cryptographic algorithms by implementing and executing them.
- Implementing public-key cryptosystem.
- Implementing the fundamental ideas of public-key and private-key cryptography

### Credit Risk Assessment

**Description:** The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the bank's profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

### The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data (Download from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns\_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign\_worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

### Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? Why or Why not?
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why? (10 marks)
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)).

Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

12. (Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR.

**Task Resources:**

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
  - Introduction to Weka (html version) (download ppt version)
  - Download Weka
  - Weka Tutorial
  - ARFF format
  - Using Weka from command line

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

III YEAR II SEM

## WEB TECHNOLOGIES LAB

### Objectives:

- To explain how to create web pages using HTML.
- To teach the basic concepts of HTML, DHTML and XML for web pages.
- To explain servlets and JSP.
- To develop web sites using HTML, XML, Servlets, JSP, JDBC and ODBC.

### Outcomes:

- Design static pages using html.
- Design server side scripting with Servlets and JSP.
- Create their own web applications using html, xml, and servlets, JSP, ODBC and JDBC.

### Hardware and Software required :

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free ] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. JDK(Java development kit) must be also be installed

### Week-1:

Design the following static web pages required for an online book store web site.

#### 1) HOME PAGE:

The static home page must contain three **frames**.

Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame : At least four links for navigation, which will display the catalogue of respective links.  
For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

	Web Site Name			
Logo				
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

#### 2) LOGIN PAGE:

This page looks like below:



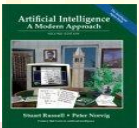




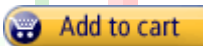
	Web Site Name			
Logo				
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVI L	Login : <input type="text"/>		Password: <input type="text"/>	
		Submit	Reset	

### 3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

	Web Site Name			
Logo				
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Wiely	\$ 40.5	
ECE		Book : AI Author : S.Russel	\$ 63	
EEE		Book : Java 2 Author : Watson	\$ 35.5	
CIVI L		Book : HTML in 24 hours Author : Sam Peter	\$ 50	
		Publication : BPB publications		
		Publication : Princeton hall		
		Publication : Sam publication		

Note: Week 2 contains the remaining pages and their description.

### Week-2:

### 4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

	Web Site Name			
Logo				
Home	Login	Registratio n	Catalogue	Cart

CSE ECE EEE CIVI L	Book name	Price	Quantity	Amount
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
	<b>Total amount -</b>			\$130.5

### 5) REGISTRATION PAGE:

Create a "registration form" with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

### WEEK 3:

#### **VALIDATION:**

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

### Week-4:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles:  
In the style definition you define how each selector should work (font, color etc.).  
Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}
```

For example:

```

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>

```

- 2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);}
```

- 3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

- 4) Define styles for links as

```
A:link
A:visited
A:active
A:hover
```

Example:

```

<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>

```

- 5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>
```

LAYER 2 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:4">LAYER 2</div>
```

6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink { cursor:crosshair}
.hlink{ cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<html>
<head>
<style type="text/css">
.xlink { cursor:crosshair}
.hlink{ cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

### Week-5:

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.  
Note: Give at least for 4 books. It should be valid syntactically.  
Hint: You can use some xml editors like XML-spy

### **Week-6:**

#### **VISUAL BEANS:**

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the “property window “.

### **Week-7:**

- 1) Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.

Access the pages by using the url : <http://localhost:4040/rama/books.html> (for tomcat)

<http://localhost:8080/books.html> (for Apache)

### **Week-8:**

#### **User Authentication :**

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords ) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display “ You are not an authenticated user “.

Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

### **Week-9:**

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

### **Week-10:**

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database ( similar to week8 instead of cookies).

### **Week-11:**

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount )) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

### **Week-12:**

**HTTP** is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalog page. He can check the cart page for the

selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method `session.invalidate()` ).

Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.



**SOFTWARE TESTING METHODOLOGIES**

**Objectives**

- To understand Software Quality Assurance Framework and Components of SQA.
- To understand different Quality standards in SQA.
- To understand different Software Testing Techniques.
- To understand different Software Testing Strategies.
- To understand different Software Testing Methodologies.
- To understand different Software Testing Tools.

**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.

**REFERENCE BOOKS:**

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing, 3<sup>rd</sup> edition, P.C.Jorgensen, Aurbach Publications (Dist.by SPD).
3. Software Testing, N.Chauhan, Oxford University Press.
4. Introduction to Software Testing, P.Ammann & J.Offutt, Cambridge Univ.Press.
5. Effective methods of Software Testing, Perry, John Wiley, 2<sup>nd</sup> Edition, 1999.
6. Software Testing Concepts and Tools, P.Nageswara Rao, dreamtech Press.
7. Software Testing, M.G.Limaye, TMH.
8. Software Testing, S.Desikan, G.Ramesh, Pearson.
9. Foundations of Software Testing, D.Graham & Others, Cengage Learning.
10. Foundations of Software Testing, A.P.Mathur, Pearson.

**OBJECT ORIENTED ANALYSIS AND DESIGN**

**Objectives:**

- Concisely define the following key terms: class, object, state, behavior, object class, class diagram, object diagram, operation, encapsulation, constructor operation, query operation, update operation, scope operation, association, association role, multiplicity, association class, abstract class, concrete class, class-scope attribute, abstract operation, method, polymorphism, overriding, multiple classification, aggregation, and composition.
- Describe the activities in the different phases of the object-oriented development life cycle.
- State the advantages of object-oriented modeling vis-à-vis structured approaches.
- Compare and contrast the object-oriented model with the E-R and EER models.
- Model a real-world application by using a UML class diagram.
- Provide a snapshot of the detailed state of a system at a point in time using a UML (Unified Modeling Language) object diagram.
- Recognize when to use generalization, aggregation, and composition relationships.
- Specify different types of business rules in a class diagram.

**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-VII**

**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 Fado: 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. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning.
5. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.
6. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.
7. UML and C++, R.C.Lee, and W.M.Tepfenhart, PHI.
8. Object Oriented Analysis, Design and Implementation, B.Dathan, S.Ramnath, Universities Press.
9. OODesign with UML and Java, K.Barclay, J.Savage, Elsevier.
10. Mark Priestley: Practical Object-Oriented Design with UML, TMH.



**MOBILE APPLICATION DEVELOPMENT**

**Objectives:**

Mobile application development is the process by which application software is developed for low-power handheld devices, such as personal digital assistants, enterprise digital assistants or mobile phones. These applications can be pre-installed on phones during manufacture, downloaded by customers from various mobile software distribution platforms, or delivered as web applications using server-side or clientside processing (e.g. JavaScript) to provide an "application-like" experience within a Web browser. Application software developers also have to consider a lengthy array of screen sizes, hardware specifications and configurations because of intense competition in mobile software and changes within each of the platforms.

**Outcomes:**

On completion of this course the students should be able to:

- Design, implement and evaluate a User Interface for a mobile application using J2ME.
- Create a small but realistic working mobile application for small computing devices.
- Categorize the challenges posed by developing mobile applications and be able to propose and evaluate and select appropriate solutions.

**UNIT I: J2ME Overview**

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices

*Small Computing Technology*

Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants

**UNIT II: J2ME Architecture and Development Environment**

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit

**UNIT III: J2ME Best Practices and Patterns:**

The Reality of Working in a J2ME World, Best Practices, *Commands, Items, and Event Processing*, J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

**UNIT IV: High-Level Display: Screens:** Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

*Low-Level Display: Canvas:* The Canvas, User Interactions, Graphics, Clipping Regions, Animation

**UNIT V: Record Management System**

Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener

**UNIT VI: JDBC Objects:**

The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions

**UNIT VI: JDBC and Embedded SQL:** Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWS

**UNIT VIII: Generic Connection Framework**

The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

### TEXT BOOK

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.

### REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005
4. Kicking Butt with MIDP and MSA: Creating Great Mobile Applications, 1<sup>st</sup> edition, J. Knudsen, Pearson.



**VLSI DESIGN**

**Objectives:**

- To understand the steps involved in IC fabrication.
- To study basic electrical properties of MOS & CMOS circuits.
- To understand VLSI circuit design processes representations of stick diagram & layout diagram.
- To study gate level design & delays.
- To study different combinational & sequential circuits. To understand VHDL synthesis.
- To study differential strategies for testing of IC's and CMOS testing in particular.

**Outcomes:**

- Ability to demonstrate the fundamentals of IC Technology such as various MOS fabrication technologies.
- Ability to calculate electrical properties of MOS circuits.
- Ability to design various gates, adders, Multipliers, Memories, using stick diagrams, layouts.
- Ability to apply design rules.
- Ability to demonstrate semiconductor IC design such as PLA's, PAL, FPGA, CPLDs.
- Ability to demonstrate VHDL synthesis, simulation, design captures tools, design verification tools and CMOS testing.

**UNIT I**

**Introduction:** Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS, Technologies; Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors, CMOS Nanotechnology.

**UNIT II**

**Basic Electrical Properties:** Basic Electrical Properties of MOS and BiCMOS Circuits:  $I_{ds}$ - $V_{ds}$  relationships, MOS transistor threshold Voltage,  $g_m$ ,  $g_{ds}$ , Figure of merit  $\omega_0$ ; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

**UNIT III**

**VLSI Circuit Design Processes:** VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2  $\mu$ m CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

**UNIT IV**

**Gate Level Design:** Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

**UNIT V:**

**Data Path Subsystems:** Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.

**UNIT VI:**

**Array Subsystems:** SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory.

**UNIT VII:**

**Semiconductor Integrated Circuit Design:** PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, Parameters influencing low power design.

**UNIT VIII**

**CMOS Testing:** CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

**TEXT BOOKS:**

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, PHI, 2005 Edition
2. VLSI Desing- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
3. CMOS VLSI Design – A circuits and systems perspective, Neil H. E Weste, David Harris, Ayan Banerjee, pearson, 2009.

**REFERENCES:**

1. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
2. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
3. VLSI Design – A.Albert Raj, Latha, PHI, 2008
4. Introduction to VLSI – Mead & Convey, BS Publications, 2010
5. VLSI Design – M. Micheal Vai, CRC Press, 2009.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR I SEM

## WIRELESS NETWORKS AND MOBILE COMPUTING (ELECTIVE - I)

### Objectives:

The main objective of this course is to provide the students with the competences required for understanding and using the communications component of an universal communications environment. Students will be provided, in particular, with the knowledge required to understand

- emerging communications networks,
- their computational demands,
- the classes of distributed services and applications enabled by these networks, and
- the computational means required to create the new networks and the new applications.

### UNIT – I

Introduction to Network Technologies and Cellular Communications

HIPERLAN: Protocol Architecture, Physical Layer, Channel Access Control Sub-layer, MAC Sub-layer, Information Bases and Networking

WLAN: Infrared vs. Radio Transmission, Infrastructure and Ad Hoc Networks, IEEE 802.11. Bluetooth.: User Scenarios, Physical Layer, MAC layer, Networking, Security, Link Management

GSM: Mobile Services, System Architecture, Radio Interface, Protocols, Localization and calling, Handover, Security, and New Data Services.

Mobile Computing (MC): Introduction to MC, Novel Applications, Limitations, and Architecture

### UNIT –II

(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA. MAC Protocols for GSM, Wireless LAN (IEEE802.11), Collision Avoidance (MACA, MACAW) Protocols.

### UNIT –III

Mobile IP Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

### UNIT –IV

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

### UNIT V

Database Issues: Database Hoarding & Caching Techniques, Client–Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

### UNIT VI

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Methods, Digital Audio and Video Broadcasting (DAB & DVB). Data Synchronization – Introduction, Software, and Protocols

### UNIT VII

Mobile Ad hoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

### UNIT – VIII

Protocols and Platforms for Mobile Computing WAP, Bluetooth, XML, J2ME, JavaCard, PalmOS, Windows CE, SymbianOS, Linux for Mobile Devices.

### TEXT BOOKS

1. Raj Kamal, "Mobile Computing", Oxford University Press, 2007, ISBN: 0195686772
2. Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2004

#### REFERENCE BOOKS

1. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
2. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, Oct 2004,



**IMAGE PROCESSING AND PATTERN RECOGNITION  
(ELECTIVE - I)**

**Objectives:**

- To learn the fundamentals of image processing and algorithms.
- To understand transformations and spatial operations in image processing.
- To implement basic image processing algorithms.
- To implement pattern recognition and machine learning theories
- To design and implement certain important pattern recognition techniques
- To apply the pattern recognition theories to applications of interest
- To implement the entropy minimization, clustering transformation and feature ordering

**UNIT – I**

Fundamental steps of image processing, components of an image processing of system. The image model and image acquisition, sampling and quantization, relationship between pixels, distance functions, scanner.

**UNIT – II**

Statistical and spatial operations, Intensity functions transformations, histogram processing, smoothing & sharpening – spatial filters Frequency domain filters, homomorphic filtering, image filtering & restoration. Inverse and weiner filtering, FIR weiner filter, Filtering using image transforms, smoothing splines and interpolation.

**UNIT – III**

Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms, extension to grey scale images.

**UNIT- IV**

Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and laplace operators, edge linking and boundary detection, thresholding, regionbased segmentation, segmentation by morphological watersheds.

**UNIT –V**

Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding, Digital Image Water marking.

**UNIT –VI**

Representation and Description

Chain codes, Ploygonal approximation, Signature Boundary Segments, Skeltons, Boundary Descriptors, Regional Descriptors, Relational Descriptors, Principal components for Description, Relational Descriptors

**UNIT VII**

**Pattern Recognition Fundamentals:** Basic Concepts of pattern recognition, Fundamental problems in pattern recognition system, design concepts and methodologies, example of automatic pattern recognition systems, a simple automatic pattern recognition model

**UNIT VIII**

**Pattern classification:**

Pattern classification by distance function: Measures of similarity, Clustering criteria, K-means algorithm, Pattern classification by likelihood function: Pattern classification as a Statistical decision problem, Bayes classifier for normal patterns.

**TEXT BOOKS**

1. Digital Image Processing Third edition, Pearson Education, Rafael C. Gonzalez, Richard E. Woods.
2. Pattern recognition Principles: Julius T. Tou, and Rafael C. Gonzalez, Addison-Wesley Publishing company.

**REFERENCE BOOKS:**

1. Image Processing, Analysis and Machine Vision, Second Edition, Milan Sonka, Vaclav Hlavac and Roger Boyle. Thomson learning
2. Digital Image Processing – William k. Pratt – John Wiley edition.
3. Fundamentals of digital image processing – by A.K. Jain, PHI.
4. Pattern classification, Richard Duda, Hart and David Stork John Wiley publishers.
5. Digital Image Processing, S. Jayaraman, S. Esakkirajan, T. Veerakumar, TMH.
6. Pattern Recognition, R. Shinghal, Oxford University Press.



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B.TECH (IT)

IV YEAR I SEM

## SOFT COMPUTING (ELECTIVE - I)

### Objectives:

- To give students knowledge of soft computing theories fundamentals, i.e. Fundamentals of neural networks, fuzzy sets and fuzzy logic and genetic algorithms.

### UNIT-I

AI Problems and Search: AI problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques-Generate and Test, Hill Climbing, Best First Search Problem reduction.

### UNIT-II

Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation- Using Predicate Logic and Rules.

### UNIT-III

Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Backpropagation Network. Associative Memory Networks. Training Algorithms for pattern association, BAM and Hopfield Networks.

### UNIT-IV

Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks.

### UNIT-V

Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks. Introduction to Classical Sets ( crisp Sets)and Fuzzy Sets- operations and Fuzzy sets. Classical Relations.

### UNIT-VI

Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations. Membership functions- Features, Fuzzification, membership value assignments, Defuzzification.

### UNIT-VII

Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making.

### UNIT-VIII

Fuzzy Logic Control Systems. Genetic Algorithm- Introduction and basic operators and terminology.Applications: Optimization of TSP, Internet Search Technique

### TEXT BOOKS:

- Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007
- Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva,. Pearson Edition, 2004.

### REFERENCES :

1. Computational Intelligence, Amit Konar, Springer.
2. Artificial Intelligence and Soft Computing- Behavioural and Cognitive Modelling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
3. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
4. Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.
5. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.

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B.TECH (IT)

IV YEAR I SEM

## SEMANTIC WEB AND SOCIAL NETWORKS (ELECTIVE - I)

### Objectives:

- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

### UNIT I:

Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Todays Web, The Next Generation Web

### UNIT II:

Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

### UNIT III:

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web –Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL),UML,XML/XML Schema.

### UNIT IV:

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping,

### UNIT V

logic, rule and Inference Engines. Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base

### Unit VI:

XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

### UNIT VII:.

What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks,

### UNIT VIII

Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

### TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley interscience, 2008.
2. Social Networks and the Semantic Web , Peter Mika, Springer, 2007.

### REFERENCE BOOKS:

1. Semantic Web Technologies , Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services - Liyang Lu Chapman and Hall/CRC Publishers, (Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

IV YEAR I SEM

## INFORMATION RETRIEVAL SYSTEMS (ELECTIVE - II)

### Objectives:

On completion of this course you should have gained a good understanding of the foundation concepts of information retrieval techniques and be able to apply these concepts into practice. Specifically, you should be able to:

- To use different information retrieval techniques in various application areas
- To apply IR principles to locate relevant information large collections of data
- To analyze performance of retrieval systems when dealing with unmanaged data sources
- To Implement retrieval systems for web search tasks.

### UNIT I

**Introduction:** Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses, **Information Retrieval System Capabilities** - Search, Browse, Miscellaneous.

### UNIT II

**Cataloging and Indexing:** Objectives, Indexing Process, Automatic Indexing, Information Extraction, **Data Structures:** Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

### UNIT III

**Automatic Indexing:** Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

### UNIT IV

**Document and Term Clustering:** Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

### UNIT V

**User Search Techniques:** Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.

**Information Visualization:** Introduction, Cognition and perception, Information visualization technologies.

### UNIT VI

**Text Search Algorithms:** Introduction, Software text search algorithms, Hardware text search systems.

**Information System Evaluation:** Introduction, Measures used in system evaluation, Measurement example – TREC results.

### UNIT VII

**Multimedia Information Retrieval** – Models and Languages – Data Modeling, Query Languages, Indexing and Searching.

### UNIT VIII

**Libraries and Bibliographical Systems** – Online IR Systems, OPACs, Digital Libraries.

## **TEXTBOOKS**

1. Information Storage and Retrieval Systems: Theory and Implementation By Kowalski, Gerald, Mark T Maybury ,Springer.
2. Modern Information Retrieval By Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics By David A Grossman and Ophir Frieder, 2<sup>nd</sup> Edition, Springer.

## **REFERENCE BOOKS**

1. Information Retrieval Data Structures and Algorithms By William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
2. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.
3. Introduction to Information Retrieval By Christopher D. Manning and Prabhakar Raghavan, Cambridge University Press, 2008.
4. Natural Language Processing and Information Retrieval, T.Siddiqui and U.S.Tiwary, Oxford Univ. Press.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

IV YEAR I SEM

## HUMAN COMPUTER INTERACTION (ELECTIVE - II)

### Objectives:

You will gain an overview of Human-Computer Interaction (HCI), with an understanding of user interface design in general, and alternatives to traditional "keyboard and mouse" computing; become familiar with the vocabulary associated with sensory and cognitive systems as relevant to task performance by humans; be able to apply models from cognitive psychology to predicting user performance in various human-computer interaction tasks and recognize the limits of human performance as they apply to computer operation; appreciate the importance of a design and evaluation methodology that begins with and maintains a focus on the user; be familiar with a variety of both conventional and non-traditional user interface paradigms, the latter including virtual and augmented reality, mobile and wearable computing, and ubiquitous computing; and understand the social implications of technology and their ethical responsibilities as engineers in the design of technological systems. Finally, working in small groups on a *product design from start to finish will provide you with invaluable team-work experience*

### 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 DreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia

### REFERENCE BOOKS:

1. Human – Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
3. User Interface Design, Soren Lauesen , Pearson Education.
4. Human –Computer Interaction,D.R.Olsen,Cengage Learning.
5. Human –Computer Interaction,Smith - Atakan,Cengage Learning.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR I SEM

## MULTIMEDIA AND RICH INTERNET APPLICATIONS (ELECTIVE - II)

### Objectives:

This course aims to further develop students' competency in producing dynamic and creative graphic solutions for multimedia productions. It provides students with the basic concepts and techniques of interactive authoring. It also introduces students with the advanced scripting skills necessary for implementing highly interactive, rich internet applications using multimedia technologies and authoring tools. Students will develop aesthetic value and competencies in multimedia authoring. Artistic visual style and layout design are stressed, as well as the editing and integration of graphic images, animation, video and audio files. The course allows students to master industry-wide software and technologies to create highly interactive, rich internet applications.

### 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

Multimedia Data Compression: Lossless compression algorithms, Lossy compression algorithms, Image compression standards.

### UNIT IV

Basic Video compression techniques, Case study: MPEG Video Coding I, Basic Audio compression techniques, Case study: MPEG Audio compression.

### UNIT - V

#### Web 2.0

What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

### UNIT - VI

#### Rich Internet Applications(RIAs) with Adobe Flash

Adobe Flash- Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.

### UNIT - VII

**Rich Internet Applications(RIAs) with Flex 3** - Introduction, Developing with Flex 3, Working with Components, Advanced Component Development, Visual Effects and Multimedia,

### UNIT-VIII

#### Ajax- Enabled Rich Internet Application

Introduction, Traditional Web Applications vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xmlhttprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo Toolkit.

### TEXT BOOKS:

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI Learning, 2004
2. Professional Adobe Flex 3, Joseph Balderson, Peter Ent, et al, Wrox Publications, Wiley India, 2009.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel, Deitel Developer Series, Pearson Education.

## REFERENCES:

1. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, 2001, rp 2005.
2. Multimedia Making it work, Tay Vaughan, 7<sup>th</sup> edition, TMH, 2008.
3. Introduction to multimedia communications and Applications, Middleware, Networks, K.R.Rao, Zoran, Dragored, Wiley India, 2006, rp. 2009.
4. Multimedia Computing, Communications & Applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Education, 2004
5. Principles of Multimedia, Ranjan Parekh, TMH, 2006.
6. Multimedia in Action, James E.Shuman, Cengage Learning, 198, rp 2008.
7. Multimedia Systems design, Prabhat K. Andleigh, Kiran Thakrar, PHI, 1986.
8. Multimedia and Communications Technology, Steve Heath, Elsevier, 1999, rp 2003.
9. Adobe Flash CS3 Professional, Adobe press, Pearson Education, 2007.
10. Flash CS3 Professional Advanced, Russel Chun, Pearson Education, 2007.
11. Flash CS5, Chris Grover, O'Reilly, SPD, 2010.
12. SAMS Teach yourself Adobe flash CS3, Pearson Education, 2007.
13. Flex 4 Cookbook, Joshua Noble, et.al, O'Reilly, SPD 2010.
14. Flex3 – A beginner's guide, Michele E.Davis, Jon A.Phillips, TMH, 2008.
15. Mastering Dojo, R.Gill, C.Riecke and A.Russell, SPD.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR I SEM

## SCRIPTING LANGUAGES (ELECTIVE – II)

### Objectives:

The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications dealing with Bio-information/ Bio-data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development.

### UNIT – I Introduction to PERL and Scripting

Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

### UNIT – II Advanced perl

Finer points of looping, pack and unpack, filesystem, eval, datastructures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

### UNIT – III PHP Basics

PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Datatypes, Variables, Constants, expressions, string interpolation, control structures . Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

### UNIT – IV Advanced PHP Programming

PHP and Web Forms, Files, PHP Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

### UNIT - V TCL

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

### UNIT VI Tk

Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding , Perl-Tk.

### UNIT – VII Python

Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling.

### UNIT - VIII

Integrated Web Applications in Python – Building Small, Efficient Python Web Systems , Web Application Framework.

### TEXT BOOKS:

1. The World of Scripting Languages , David Barron, Wiley Publications.
2. Python Web Programming , Steve Holden and David Beazley , New Riders Publications.
3. Beginning PHP and MySQL , 3<sup>rd</sup> Edition , Jason Gilmore, Apress Publications (Dream tech.).

**REFERENCE BOOKS:**

1. Open Source Web Development with LAMP using Linux ,Apache,MySQL,Perl and PHP,J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development ,Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,I.Bayross and S.Shah,The X Team,SPD.
5. Core Python Programming,Chun,Pearson Education.
6. Guide to Programming with Python,M.Dawson,Cengage Learning.
7. Perl by Example,E.Quigley,Pearson Education.
8. Programming Perl,Larry Wall,T.Christiansen and J.Orwant,O'Reilly,SPD.
9. Tcl and the Tk Tool kit,Ousterhout,Pearson Education.
10. PHP and MySQL by Example,E.Quigley,Prentice Hall(Pearson).
11. Perl Power,J.P.Flynt,Cengage Learning.
12. PHP Programming solutions,V.Vaswani,TMH.



**CASE TOOLS AND SOFTWARE TESTING LAB**

**Case Tools Lab**

**UML:**

**Objectives:**

- Understand how UML supports the entire OOAD process.
- Become familiar with all phases of OOAD.

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

**Description for an ATM System**

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of

customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

### Software Testing Lab

#### Software Testing :

##### Objectives:

1. To learn to use the following (or Similar) automated testing tools to automate testing:
  - a) Win Runner/QTP for functional testing.
  - b) LoadRunner for Load/Stress testing.
  - c) Test Director for test management.
  - d) JUnit, HTML Unit, CPP Unit.

##### List of Experiments

1. Write programs in 'C' Language to demonstrate the working of the following constructs:
  - i) do...while ii) while...do iii) if...else iv) switch v) for
2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents\* and final test report document.

\*Note: To create the various testing related documents refer to the text "Effective Software Testing Methodologies by William E. Perry"

**MOBILE APPLICATIONS DEVELOPMENT LAB**

**Objective:**

In this lab, a student is expected to design, implement, document and present a mobile client/server system using standard Java and Java 2 Micro Edition (J2ME) platform. Specifically it is required to design and implement a system that consists mainly of a mobile client (MC) and a Proxy Server (PS). MC will be written in J2ME, MIDP 2.0, while PS will be written in standard Java. It is necessary to use a mobile phone emulator to develop and demonstrate the experiments.

It may be necessary to use other components or existing resources (servers) as needed. For instance a database local to PS or a web service available on the Internet that can be invoked by the PS.

**Week - 1: Installation of Java Wireless Toolkit (J2ME)**

1) If the Java Development Kit (JDK) is not there or only having the Java Runtime Environment (JRE) installed, install the latest JDK from <http://java.sun.com/javase/downloads/index.jsp>. Current stable release of Java is JDK 6 Update 7 but check the web page in case there are newer non-beta releases available.

2) Next, download the **Java Wireless Toolkit** (formerly called J2ME Wireless Toolkit) from: <http://java.sun.com/products/sjwtoolkit/download.html>.

3) Run the installer (for example, for Windows it is: sun\_java\_wireless\_toolkit-2\_5\_2-windows.exe). The installer checks whether a compatible Java environment has been pre-installed. If not, it is necessary to uninstall old versions of Java and perform Step 1 again.

Once after successful installation of Java and the tool kit compile this program and run the following program in the toolkit.

Steps to run this program in toolkit:

1. Start -> All Programs -> Sun Java Tool Kit -> Wireless Tool Kit
2. Click New Project – Enter Project Name -> Enter Class Name -> Click on Create Project.
3. Choose appropriate API Selection and Configurations.
4. Place Java Source file in WTK2.1 / WTK2.2\apps\projectname\src
5. Build the Project.
6. Run the Project.

```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;
```

```
public class HelloWorld extends MIDlet{
    private Form form;
    private Display display;

    public HelloWorld(){
        super();
    }
    public void startApp(){
        form = new Form("Hello World");
        String msg = "Hello World!!!!!!!";
        form.append(msg);
        display = Display.getDisplay(this);
        display.setCurrent(form);
    }

    public void pauseApp(){ }

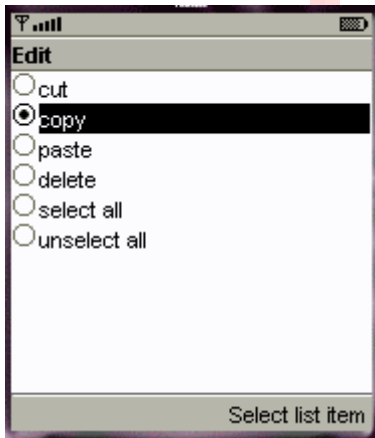
    public void destroyApp(boolean unconditional){
        notifyDestroyed();
    }
}
```

## Week - 2 Working with J2ME Features:

Working with J2ME Features: Say, creating a *Hello World* program Experiment with the most basic features and mobile application interaction concepts (lists, text boxes, buttons, radio boxes, soft buttons, graphics, etc)

### 2.1 Create a program which creates to following kind of menu.

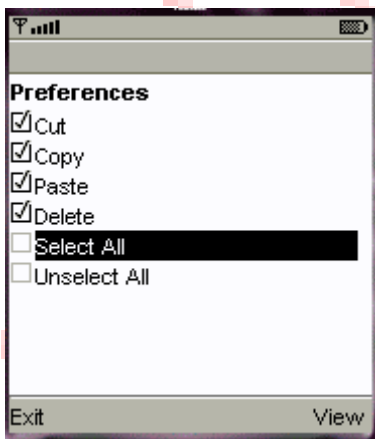
- \* cut
- \* copy
- \* paste
- \* delete
- \* select all
- \* unselect all



### 2.2 Event Handling.

Create a menu which has the following options:

- \* cut - can be on/off
- \* copy - can be on/off
- \* paste - can be on/off
- \* delete - can be on/off
- \* select all - put all 4 options on
- \* unselect all - put all 4 options off



### 2.3. Input checking

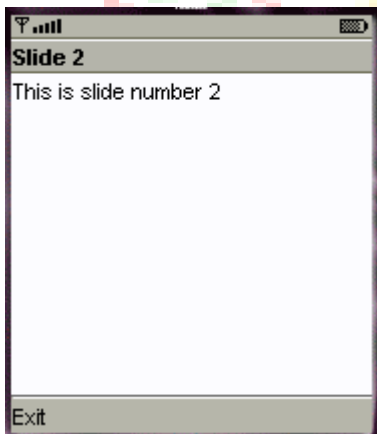
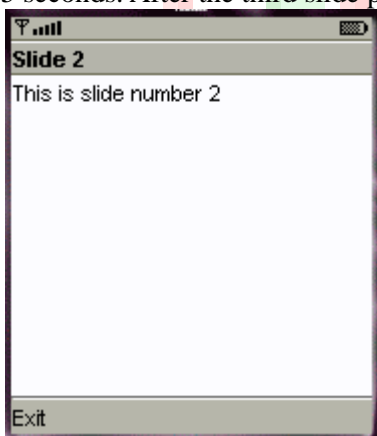
Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.

- \* Area code should be one of the following: 040, 041, 050, 0400, 044
- \* There should 6-8 numbers in telephone number (+ area code)



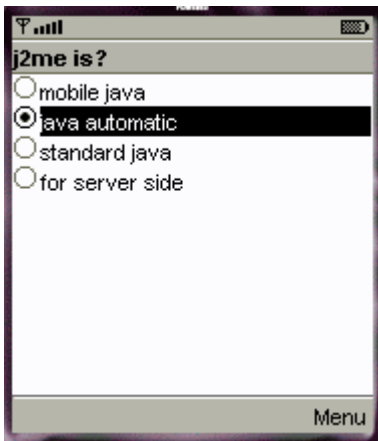
### ***Week - 3 Threads & High Level UI:***

3.1. Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.

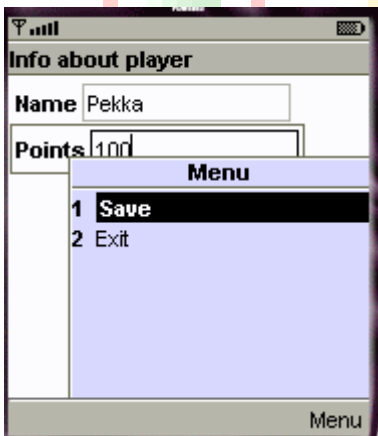
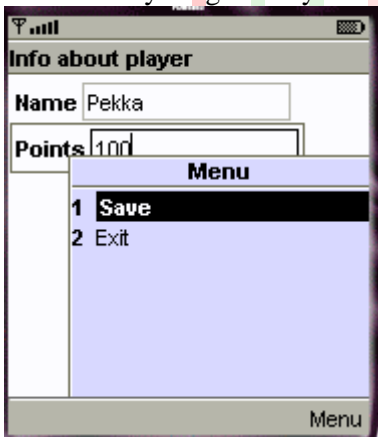


### **3.2 High-level UI**

Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.



3.3 Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.

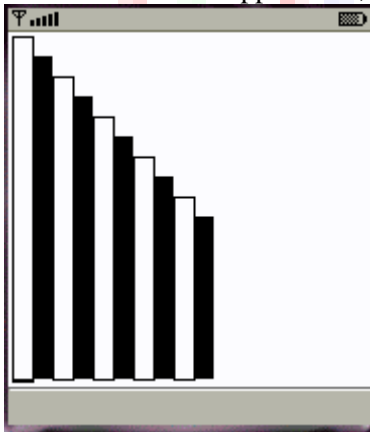


## Week - 4 Working on Drawing and Images

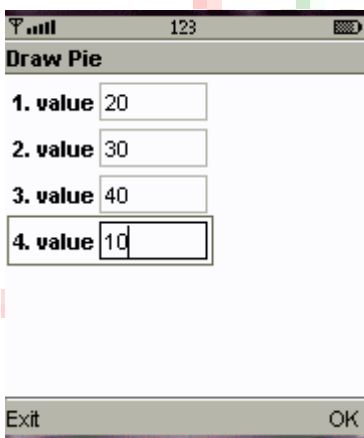
4.1 Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

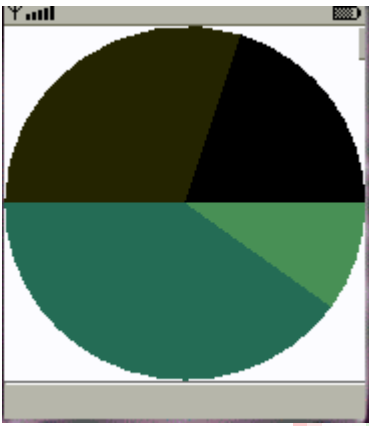


4.2 Create a MIDP application, which draws a bar graph to the display. Data values can be given at `int[]` array.



4.3 Create a MIDP application, which draws a bar graph to the display. Data values can be given at `int[]` array. You can enter four data (integer) values to the input text field.

A screenshot of a Java Swing window titled "Draw Pie". The window has a title bar with the text "123" and a close button. Below the title bar, there are four input fields, each preceded by a label: "1. value", "2. value", "3. value", and "4. value". The values entered in the fields are 20, 30, 40, and 10 respectively. At the bottom of the window, there are two buttons: "Exit" on the left and "OK" on the right.



## Week - 5 Developing Networked Applications using the Wireless Toolkit

### Creating a Simple Client-Server Application

Create, compile and run a basic UDP-based client-server application.

#### Creating the Datagram Server project

- 1) Click on Wireless Toolkit 2.5.2 under the group: **All Programs**→**Sun Java (TM) Wireless Toolkit 2.5.2**.
- 2) Click on 'New Project...' button.
- 3) Enter project name as '**DatagramServer**'. Enter MIDlet name as '**DatagramServer**'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class, otherwise the application won't run.
- 4) Another window pops up where it is required to select a target platform. Select '**MIDP 1.0**' from the drop down list.
- 5) After clicking OK, the project is created; and the Wireless Toolkit tells that the name of the folder where source code files are created. The path of the source code folder is displayed in the debug output window.

#### Creating and Compiling the DatagramServer source files

The Wireless Toolkit does not come with an IDE by default so Use any IDE or a text editor like *Notepad*.

- 1) Create a new text file called **DatagramServer.java** in the source folder of the project. The exact path of this folder is displayed in the Wireless Toolkit window.
- 2) Paste contents **DatagramServer.java** from into the source file.

#### Running your Server application on the Phone simulator

- 1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
- 2) A graphical window depicting a phone handset will appear with the name of your application highlighted on its screen as shown below.
- 3) To start the application, click on the right soft-key (marked with a dot) below the '**Launch**' command.
- 4) The phone simulator might ask if it is OK to run the network application. Select '**Yes**' by clicking on the appropriate soft-key. The server is now up and running.
- 5) Keep the server running during the creation, compilation and running of the Datagram Client application.

#### Creating the DatagramClient project

- 1) Use the same instance of the Wireless Toolkit that is used for creating and compiling the Datagram Server project.
- 2) Click on 'New Project...' button.
- 3) A new window pops up. Enter project name as '**DatagramClient**'. Enter MIDlet name as '**DatagramClient**'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class.
- 4) Another window pops up where one has to select a target platform. Select '**MIDP 1.0**' from the drop down list.
- 5) After clicking OK, the project is created and the Wireless Toolkit tells where to place the source code files. The path of the source code folder is displayed in the debug output window as explained before.

#### Creating and Compiling the DatagramClient source files

- 1) Create a new text file called **DatagramClient.java** in the source folder of the project.
- 2) Paste contents **DatagramClient.java** into the source file.
- 3) Then click on the Build button in the Wireless Toolkit window. If the compilation is OK, it will say Build Complete

in the window's debug output window, otherwise it will show the errors. Note: In the source code, use the `System.out.println()` statement to output debug information to this window.

### **Running your Client application on the Phone simulator**

- 1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
- 2) A graphical window depicting a phone handset will appear with the name of the application highlighted on its screen.
- 3) To start the application, click on the right soft-key (marked with a dot) below the 'Launch' command.
- 4) The phone simulator might ask if it is OK to run the network application. Select 'Yes' by clicking on the appropriate soft-key. The client is now up and running.
- 5) When the client executes on the phone simulator, one should see a text box with the caption 'Message'. Enter any message and press the right soft-key (corresponding to Send). If the client-server application is working properly, the screen of the server phone will display the message sent by the client and the client screen will now display a message sent by the server in response. The response message from the server is the original client message in reverse.
- 6) Try various features of the phone simulator including the different look-and feel options.

### ***Week - 6 Authentication with a Web Server***

#### **6.1 Write a sample program to show how to make a SOCKET Connection from j2me phone.**

This J2ME sample program shows how to how to make a SOCKET Connection from a J2ME Phone. Many a times there is a need to connect backend HTTP server from the J2ME application. shows how to make a SOCKET connection from the phone to port 80.

#### **6.2 Login to HTTP Server from a J2ME Program**

This J2ME sample program shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server.

Many J2ME applications for security reasons require the authentication of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server.

Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.

### ***Week - 7 & 8 Web Application using J2ME***

The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## MANAGEMENT SCIENCE

### Objectives:

- To study the various aspects of Management.
- To study the concepts of Management, organization and Administration
- To learn various types of plant layouts
- To learn about the Principles and functions of Materials Management and Network Analysis.
- To study about the vision & mission statements of an organization
- To know various recruitment methods of various enterprises
- To study quality control measures

### Outcomes:

- Understand the concepts of Management, Organization and Administration and apply the different motivational theories.
- Design plant layout and apply various statistical process control technologies to up keep productivity.
- Understands the Principles and functions of Materials Management and formulate various marketing and selling strategies.
- Design and implement vision and mission statements.

### UNIT I

**Introduction to Management:** Entrepreneurship and organization - Nature and Importance of Management, Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Douglas McGregor's Theory X and Theory Y, Systems Approach to Management. Ethics and corporate social responsibilities.

### UNIT II

**Designing Organisational Structures:** Departmentation, Decentralisation centralization and Recentralization. Types of Organisation structures - Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Cellular Organisation, team 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:  $\bar{X}$  chart, R chart,  $c$  chart,  $p$  chart,

### UNIT IV

**Project Management (PERT/CPM):** Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), identifying critical path, Project Cost Analysis, Project Crashing.

### UNIT V

**A) Materials Management:** Objectives, Need for Inventory control, EOQ, ABC Analysis, VED Analysis, FSN Analysis, Purchase Procedure, Stores Management - Logistics and basics of supply Chain Management.

**B) Marketing:** Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle., Channels of distribution. Retailing and Basics of Rural Marketing.

### UNIT VI

**Human Resources Management (HRM):** Evolution of HRM, Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Promotion, Motivation and leadership - Basic concepts and theories, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

## UNIT VII

**Strategic Management:** Porter's five factors theory, Vision, Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, PEST Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Strategies and benefits of information and communication technologies (ICT).

## UNIT VIII

**Contemporary Management Practices:** Basic concepts of Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Value Chain Analysis, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering 5S Model, Benchmarking, Balanced Score Card.

## REFERENCE BOOKS:

1. Aryasri: *Management Science*, TMH, New Delhi, 2009
2. Stoner, Management, Pearson, 2009
3. Kotler Philip & Keller Kevin Lane: *Marketing Management* PHI, 2009.
4. Koontz, Weihrich, & Aryasri: *Principles of Management*, TMH, 2009.
5. Thomas N. Duening & John M. Ivancevich *Management—Principles and Guidelines*, Cengage, 2009.
6. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2009.
7. Memoria & S.V. Ganker, *Personnel Management*, Himalaya, 2009
8. Schermerhorn: *Management*, Wiley, 2009.
9. Parnell: *Strategic Management*, Biztantra, 2009.
10. L.S. Srinath: *PERT/CPM*, Affiliated East-West Press, 2009.
11. William J. Stevenson & Ceyhun Ozgur: *Introduction to Management Science*, TMH, 2007.
12. P. Subba Rao : *Human Resource Management*.
13. Ramaswamy Namakumari: *Marketing Management*.

**Pre-requisites:** Managerial Economics

**Objective:** To familiarize with the process of management and to provide basic insights into select contemporary management practices.

**Codes/Tables:** Normal Distribution Function Table need to be permitted into the examination Hall.

**Question Paper Pattern:** 5 Questions to be answered out of 8 questions. The question paper should contain atleast 2 practical problems, one each from units –III & IV

Each question should not have more than 3 bits.

*Unit VIII will have only short questions, not essay questions.*

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## WEB SERVICES

(ELECTIVE – III)

### Objectives:

- To understand the details of Web services technologies: SOAP, WSDL, UDDI
- To learn how to implement and deploy web service clients and servers.
- To explore interoperability between different frameworks.
- To learn basic concepts of SOA

### UNIT - I

**Evolution and Emergence of Web Services** - Evolution of distributed computing, Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

### UNIT - II

**Introduction to Web Services** – The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

### UNIT - III

**Web Services Architecture** – Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services, developing web services enabled applications.

### UNIT - IV

**Core fundamentals of SOAP** – SOAP Message Structure, SOAP encoding , SOAP message exchange models, SOAP communication and messaging, SOAP security.

### UNIT - V

**Developing Web Services using SOAP** – Building SOAP Web Services, developing SOAP Web Services using Java, limitations of SOAP.

### UNIT - VI

**Describing Web Services** – WSDL – WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

### UNIT - VII

**Discovering Web Services** – Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI – UDDI Registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, support for categorization in UDDI Registries, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, deleting information in a UDDI Registry, limitations of UDDI.

### UNIT - VIII

**Web Services Interoperability** – Means of ensuring Interoperability, Overview of .NET and J2EE. **Web Services Security** – XML security frame work, XML encryption, XML digital signature, XKMS structure, guidelines for signing XML documents.

### TEXT BOOKS:

1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India, rp – 2008.
2. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education, 2008.
3. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.

**REFERENCES:**

1. Building Web Services with Java, 2<sup>nd</sup> Edition, S. Graham and others, Pearson Edn., 2008.
2. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly,SPD.
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers,2005.
4. J2EE Web Services, Richard Monson-Haefel, Pearson Education.
5. Web Services, G. Alonso, F. Casati and others, Springer, 2005.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## E - COMMERCE (ELECTIVE – III)

### Objectives:

- Acquaint with fundamental terms and concepts of e-commerce.
- Compare and contrast the types of business models and e-commerce models
- Analyze important strategic planning factors when implementing e-commerce initiatives.
- Recommend appropriate technical resources for e-commerce projects.
- Evaluate e-commerce projects for financial and technological feasibility.

### Outcomes:

- Examine some typical distributed applications.
- Detail some of the problems that are encountered when developing distributed applications.
- Understand some of the technologies that are used to support distributed applications.
- Illustrate some of the business models used in the internet.

### 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 – Kalakata, Whinston, Pearson.

### REFERENCES :

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – 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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B.TECH (IT)

IV YEAR II SEM

## MIDDLEWARE TECHNOLOGIES (ELECTIVE – III)

### Objectives:

- Understand different types of client server computing models and also Benefits of client server computing, pitfalls of client server programming
- Establish communication between client and server through java RMI and JDBC
- Implement C#,Net applications using Assemblies, Callback Interfaces, Delegates, and Events.
- Carry out client server communication using heterogeneous programming languages using CORBA.
- Learn java bean component model EJBs and CORBA

### Outcomes:

- Know client server computing models and can establish communication between them
- Design a dynamic remote application with RMI and JDBC Connectivity
- Develop programming using C#.net
- Differentiate homogeneous and heterogeneous language communications.
- Develop real time projects by combining CORBA and database interfacing

### 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

**CORBA with Java:** Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java.

### UNIT III

**Introducing C# and the .NET Platform;** Understanding .NET Assemblies; Object –Oriented Programming with C#; Callback Interfaces, Delegates, and Events.

### UNIT IV

**Building c# applications:** Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.

### UNIT-V

**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-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 OTM's, EJB and CORBA OTM's, 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 Orfali and Dan Harkey, John Wiley & Sons ,SPD 2nd Edition
2. Java programming with CORBA 3rd 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 3rd edition Robert Orfali 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
5. Programming C#, Jesse Liberty, SPD-O'Reilly.
6. C# Preciesely Peter Sestoft and Henrik I. Hansen, Prentice Hall of India
7. Intoduction to C# Using .NET Pearson Education
8. C# How to program, Pearson Education
9. C# and the .NET Platform Andrew Troelsen, Apress Wiley-dreamtech, India Pvt Ltd



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B.TECH (IT)

IV YEAR II SEM

## ADHOC AND SENSOR NETWORKS (ELECTIVE – III)

### Objectives:

- To understand the concepts of sensor networks
- To understand the MAC and transport protocols for adhoc networks
- To understand the security of sensor networks
- To understand the applications of adhoc and sensor networks

### UNIT I

**Introduction to Ad Hoc Wireless Networks:** Characteristics of MANETs, Applications of MANETs, Challenges.

### UNIT II

**Routing in MANETs:** Topology-based versus Position-based approaches, Topology based routing protocols, Position based routing, Other Routing Protocols.

### UNIT III

**Data Transmission in MANETs:** The Broadcast Storm, Multicasting, Geocasting

**TCP over Ad Hoc Networks:** TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc

### UNIT IV

**Basics of Wireless Sensors and Applications:** The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

### UNIT V

**Data Retrieval in Sensor Networks:** Classification of WSNs, MAC layer, Routing layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

### UNIT VI

**Security :** Security in Ad hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

### UNIT VII

**Sensor Network Platforms and Tools:** Sensor Network Hardware, Sensor Network Programming Challenges, Node-Level Software Platforms

### UNIT VIII

**Operating System – TinyOS:**

**Imperative Language:** nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM

### TEXT BOOKS:

1. Ad Hoc and Sensor Networks – Theory and Applications, *Carlos Corderio Dharma P. Aggarwal*, World Scientific Publications / Cambridge University Press, March 2006
2. Wireless Sensor Networks: An Information Processing Approach, *Feng Zhao, Leonidas Guibas*, Elsevier Science imprint, Morgan Kauffman Publishers, 2005, rp2009

### REFERENCE BOOKS:

1. Adhoc Wireless Networks – Architectures and Protocols, C.Siva Ram Murthy, B.S.Murthy, Pearson Education, 2004
2. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group, 2010
3. Wireless Ad hoc Mobile Wireless Networks – Principles, Protocols and Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group, 2008.

4. Ad hoc Networking, *Charles E.Perkins*, Pearson Education, 2001.
5. Wireless Ad hoc Networking, *Shih-Lin Wu, Yu-Chee Tseng*, Auerbach Publications, Taylor & Francis Group, 2007
6. Wireless Ad hoc and Sensor Networks – Protocols, Performance and Control, Jagannathan Sarangapani, CRC Press, Taylor & Francis Group, 2007, rp 2010.
7. Security in Ad hoc and Sensor Networks, Raheem Beyah, et al., World Scientific Publications / Cambridge University Press, , 2010
8. Ad hoc Wireless Networks – A communication-theoretic perspective, Ozan K.Tonguz, Gialuigi Ferrari, Wiley India,2006, rp2009.
9. Wireless Sensor Networks – Signal processing and communications perspectives, Ananthram Swami, et al., Wiley India, 2007, rp2009.



**DESIGN PATTERNS  
(ELECTIVE – IV)**

**Objective:**

- To highlight the evolution of patterns.
- To learn how to add functionality to designs while minimizing complexity
- To learn what design patterns really are, and are not
- To know about specific design patterns.
- To learn how to use design patterns to keep code quality high without overdesign.

**UNIT –I**

Introduction : What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

**UNIT-II**

A Case Study : Designing a Document Editor : Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

**UNIT-III**

Creational Patterns : Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

**UNIT-IV**

Structural Pattern Part-I : Adapter, Bridge, Composite.

**UNIT-V**

Structural Pattern Part-II : Decorator, açade, Flyweight, Proxy.

**UNIT-VI**

Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.

**UNIT-VII**

Behavioral Patterns Part-II : Mediator, Memento, Observer, State, Strategy, Template Method ,Visitor, Discussion of Behavioral Patterns.

**UNIT-VIII**

What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

**TEXT BOOK :**

- 1.Design Patterns By Erich Gamma, Pearson Education
- 2.Head First Design Patterns By Eric Freeman-Oreilly-sp

**REFERENCES :**

1. Pattern's in JAVA Vol-I By Mark Grand ,Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand ,Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,Wiley DreamTech.
4. Design Patterns Explained By Alan Shalloway,Pearson Education.
5. Pattern Oriented Software Architecture,F.Buschmann&others,John Wiley & Sons.

# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## DISTRIBUTED SYSTEMS (ELECTIVE –IV)

### Objectives:

- Understand the need for distributed systems and their applications
- Understand the concepts of remote procedure calls, remote file systems, distributed
- agreement, clock synchronization, and security.

### UNIT I

Characterization of Distributed Systems-Introduction,Examples of Distributed systems,Resource sharing and web,challenges,System models-Introduction,Architectural and Fundamental models, Networking and Internetworking, Interprocess Communication.

### UNIT II

Distributed objects and Remote Invocation - Introduction, Communication between distributed objects,RPC,Events and notifications,Case study-Java RMI.  
Operating System Support- Introduction, OS layer,Protection,Processes and Threads, Communication and Invocation, Operating system architecture,Distributed File Systems-Introduction,File Service architecture,case study- SUN network file systems.

### UNIT III

Name Services-Introduction, Name Services and the Domain Name System,Case study of the Global Name Service,Case study of the X.500 Directory Service.  
Peer to Peer Systems-Introduction,Napster and its legacy,Peer to Peer middleware,Routing overlays,Overlay case studies-Pastry,Tapestry,Application case studies-Squirrel, OceanStore.

### UNIT IV

Time and Global States-Introduction,Clocks, events and Process states,Synchronizing physical clocks,logical time and logical clocks,global states,distributed debugging.  
Coordination and Agreement - Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

### UNIT V

Transactions and Concurrency control-Introduction,Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

### UNIT VI

Distributed Transactions-Introduction,Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery,Replication-Introduction,System model and group communication, Fault tolerant services, Transactions with replicated data.

### UNIT VII

Security-Introduction,Overview of Security techniques,Cryptographic algorithms,Digital signatures,Case studies-Kerberos,TLS,802.11 WiFi.

### UNIT VIII

Distributed shared memory, Design and Implementation issues, Sequential consistency and Ivy case study, Release consistency and Munin case study,Other consistency models, CORBA case study-Introduction,CORBA RMI,CORBA Services.

### TEXT BOOKS:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.
2. Distributed Systems,S.Ghosh,Chapman&Hall/CRC,Taylor&Francis Group,2010.

**REFERENCE BOOKS:**

1. Distributed Computing,S.Mahajan and S.Shah,Oxford University Press.
2. Distributed Operating Systems Concepts and Design,Pradeep K.Sinha,PHI.
3. Advanced Concepts in Operating Systems, M Singhal, N G Shivarathri, Tata McGraw-Hill Edition.
4. Reliable Distributed Systems,K.P.Birman,Springer.
5. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
6. Distributed Operating Systems and Algorithm Analysis,R.Chow,T.Johnson,Pearson.
7. Distributed Operating Systems,A.S.Tanenbaum,Pearson education.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## STORAGE AREA NETWORKS

(ELECTIVE – IV)

### Objectives:

- To understand Storage Area Networks characteristics and components.
- To become familiar with the SAN vendors and their products
- To learn Fibre Channel protocols and how SAN components use them to communicate with each other
- To become familiar with Cisco MDS 9000 Multilayer Directors and Fabric Switches
- Thoroughly learn Cisco SAN-OS features.
- To understand the use of all SAN-OS commands. Practice variations of SANOS features

### UNIT I:

Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

### UNIT II:

Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

### UNIT III:

Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system

### UNIT IV:

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN , Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfills the need , Understand the appropriateness of the different networked storage options for different application environments

### UNIT V:

List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

### UNIT VI:

Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities

### UNIT VII

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain

### UNIT VIII:

Virtualization technologies, block-level and file-level virtualization technologies and processes.

**Case Studies**

The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

**TEXT BOOK:**

1. EMC Corporation, Information Storage and Management, Wiley.

**REFERENCE BOOKS:**

1. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill , Osborne, 2003.
2. Marc Farley, "Building Storage Networks", Tata McGraw Hill ,Osborne, 2001.
3. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002.



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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B.TECH (IT)

IV YEAR II SEM

## CLOUD COMPUTING (ELECTIVE – IV)

### Objective:

- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.
- To describe the security aspects in cloud.

### Outcomes:

- Ability to understand the virtualization and cloud computing concepts

### UNIT-I

Introductory concepts and overview: Distributed systems – Parallel computing architectures: Vector processing, Symmetric multi processing and Massively parallel processing systems – High performance Cluster computing – Grid computing – Service Oriented Architecture overview – Virtualization.

### UNIT-II

Overview of Cloud Computing: Meaning of the terms cloud and cloud computing – cloud based service offerings – Grid computing Vs Cloud computing – Benefits of cloud model – limitations – legal issues – Key characteristics of cloud computing – Challenges for the cloud – The evolution of cloud computing.

### UNIT – III

Web services delivered from the cloud: Infrastructure as a service – Platform-as-a-service – Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software-as-a-service – The cloud data center – SOA as step toward cloud computing – Basic approach to a data center based SOA.

### UNIT – IV

Federation Presence, Identity and Privacy in the cloud: Federation in the cloud – Presence in the cloud – Privacy and its relation to cloud based information system. Security in the Cloud: Cloud security challenges – Software-as-a-service security

### UNIT – V

Common Standards in Cloud computing: The open cloud consortium – The distributed management task force – standards for application developers – standards for messaging – standards for security

### UNIT – VI

End user access to cloud computing: youtube – zimbra – Facebook – Zoho – DimDim Collaboration  
Mobile internet devices and the cloud: Smartphone – mobile operating systems for smart phones – Mobile Platform virtualization – Collaboration applications for mobile platforms – Future trends

### UNIT – VII

Virtualization: Adding guest Operating system. Cloud computing case studies1: Amazon EC2 – Amazon simple DB – Amazon S3 – Amazon Cloud Front – Amazon SQS

### UNIT – VIII

Cloud computing case studies2: Google App Engine- Google web tool kit – Microsoft Azure Services platform – Windows live – Exchange on line – Sharepoint services – Microsoft dynamic CRM – salesforce.com CRM – App Exchange

**TEXT BOOKS:**

1. Cloud Computing implementation, management and security by John W. Rittinghouse, James F. Ransome, CRC Press, Taylor & Francis group, 2010
2. Cloud Computing a practical approach by Anthony T. velte, Toby J. velte Robert Elsenpeter, Tata Mc Graw Hill edition, 2010

**REFERENCES:**

1. Cloud Application Architectures by George Reese, Oreilly publishers
2. Cloud computing and SOA convergence in your enterprise, by David S. Linthicum, Addison- Wesley



# J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

(Autonomous under JNTUH)

B.TECH (IT)

IV YEAR II SEM

## INDUSTRY ORIENTED MINI PROJECT

### Objectives:

- To provide the knowledge of industrial requirements to the graduates.
- To provide a clear analysis on how the functionalities is getting implemented.
- To provide an understanding of how to analyze, design and develop an application for the functionality with the requirements gathered, with known Designing

### Outcomes:

- Graduate will able to gather the requirements of the problem.
- Able to analyze, design and develop the application.
- Able to document the project.

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## SEMINAR

### Objectives:

- Attend and participate in technical seminars related to the field of CSE
- To equip the students with a broad foundation on the basic engineering concepts and fundamentals of Computer Science & Engineering
- To develop the students capability to apply these learned concepts in engineering and to implement such career as a practicing engineer
- To inculcate the students on the importance of lifelong learning

### Outcomes:

- Understand professional and ethical responsibility
- Communicate effectively
- Understand the impact of engineering solutions in a global and societal context
- Recognize the need for, and an ability to engage in life-long learning
- Get knowledge of contemporary issues
- Use the techniques, skills and modern engineering tools necessary for engineering practice.

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**PROJECT WORK**

**Objectives:**

- Allow students to demonstrate a wide range of the skills learned during their course of study by asking them to deliver a product that has passed through the design, analysis, testing, and evaluation stages.
- Encourage multidisciplinary research through the integration of material learned in a number of courses.
- Allow students to develop problem solving, analysis, synthesis and evaluation skills.
- Encourage teamwork. Improve students' communication skills.

**Outcomes:**

- Understand and describe meaningfully the problem objectives and its practical importance
- Locate, gather and interpret material and information
- Conduct a significant literature search
- Device specifications based on the objectives of their project and the planned execution approach
- Participate in a design-to-product cycle
- Apply mathematical and engineering fundamentals to creatively find solutions for open-ended real world problems
- Use modern design tools and technologies to produce novel designs
- Apply a multi-disciplinary approach to solving problems
- Work efficiently in a team
- Design, implement and test the Project.
- Critically evaluate a design against its objectives, specifications or other related solutions
- Demonstrate presentation skills in the form of oral presentations and poster communicate in writing through the production of project reports

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**IV YEAR II SEM**

**COMPREHENSIVE VIVA**

**Objectives:**

- To test the skills of the students in Computer Science & Engineering.

**Outcomes:**

- To test the skills of the students in Computer Science & Engineering.