



**PRASAD V. POTLURI**

**SIDDHARTHA INSTITUTE OF TECHNOLOGY  
(AUTONOMOUS)**

Kanuru, Vijayawada-520007

AICTE approved, NBA & NAAC accredited, An ISO 9001-2008 certified Institution  
Permanent Affiliation to JNTUK, Kakinada.

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**INFORMATION TECHNOLOGY**

**SYLLABUS BOOK**

**(PVP 14)**

**B.TECH FOUR YEAR DEGREE COURSE**

**Sponsored by  
Siddhartha Academy of General & Technical Education  
VIJAYAWADA**



## **VISION OF THE INSTITUTION**

**To provide rich ambience for academic and professional excellence, research, employability skills, entrepreneurship and social responsibility.**

## **MISSION OF THE INSTITUTION**

**To empower the students with technical knowledge, awareness of up-to-date technical trends, inclination for research in the areas of human needs, capacity building for employment / entrepreneurship, application of technology for societal needs.**





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**INFORMATION TECHNOLOGY**

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**(PVP 14)**

**B.TECH DEGREE PROGRAMME**

**Sponsored by**

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**VIJAYAWADA**



**The Vision of the Department:**

*To be a model center for Education and Training in the frontier areas of Information Technology.*

**The Mission of the Department:**

*Offer High Quality Teaching and Learning in Information Technology to prepare students for higher studies and professional career in industry.*

**PEO's**

Program Educational Objectives of Information Technology:

PEO 1: Shine as IT Expert with Proficiency in designing solutions to Information Engineering problems.

PEO 2: Pursue higher studies with the sound knowledge of fundamental concepts and skills in basic sciences and IT disciplines.

PEO 3: Showcase professionalism, team work and expose to current trends towards continuous learning.

PEO 4: Equipped with Integrity, Ethical values and become Responsible Engineers.

**PO's:**

- PO - a: An ability to apply knowledge of mathematics, science and engineering.
- PO - b: An ability to analyze, identify, formulate and solve engineering problems.
- PO - c: An ability to design and conduct experiments, analyze and interpret data with appropriate solutions
- PO - d: Equipped with the knowledge of computer basics, operating systems, networking, database and web based technologies and able to conduct investigations of complex problems.
- PO - e: An ability to demonstrate knowledge in different streams of Engineering and will be able to do multidisciplinary tasks as an individual and as a team member.
- PO - f: An ability to use modern engineering tools and software to analyze technical problems.
- PO - g: An ability to Communicate effectively, writes effective reports, and design good documentation and makes effective presentations.
- PO - h: An ability to analyze the local and global impact of Information Technology on Society and individual responsibilities as an Engineer.
- PO - i: An ability to design professional engineering solutions in environmental context and need for sustainable development.
- PO - j: Competent to possess leadership and management skills with best professional, ethical practices and social concerns.
- PO - k: An ability to analyze, design, develops and manages software systems of varying complexity
- PO - l: Recognize the need and engage in lifelong learning for professional growth.

**Course Structure (effective from Academic Year 2014-15)****I/IV B. Tech - FIRST SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT1T1	Engineering Mathematics – I	3+1*	-	30	70	100	3
IT1T2	English for Communication	3	-	30	70	100	3
IT1T3	Engineering Chemistry	3+1*	-	30	70	100	3
IT1T4	Discrete Mathematics	3+1*	-	30	70	100	3
IT1T5	Basic Electrical Engineering	3+1*	-	30	70	100	3
IT1T6	Introduction to Information Technology	3+1*	-	30	70	100	3
IT1L1	English Language Communication Skills Lab	-	3	25	50	75	2
IT1L2	IT Workshop	-	3	25	50	75	2
IT1L3	Engineering Graphics Lab	-	3	25	50	75	2
<b>TOTAL</b>		<b>23</b>	<b>9</b>	<b>255</b>	<b>570</b>	<b>825</b>	<b>24</b>

\* Practice/Interactive Session

**I/IV B. Tech - SECOND SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT2T1	Engineering Mathematics – II	3+1*	-	30	70	100	3
IT2T2	Professional Ethics	3	-	30	70	100	3
IT2T3	Engineering Physics	3+1*	-	30	70	100	3
IT2T4	Environmental Studies	3	-	30	70	100	3
IT2T5	Basic Electronics Engineering	3+1*	-	30	70	100	3
IT2T6	C Programming	3+1*	-	30	70	100	3
IT2L1	Engineering Physics and Chemistry Lab	-	3	25	50	75	2
IT2L2	Basic Electronics Engineering Lab	-	3	25	50	75	2
IT2L3	C Programming Lab	-	3	25	50	75	2
<b>TOTAL</b>		<b>22</b>	<b>9</b>	<b>255</b>	<b>570</b>	<b>825</b>	<b>24</b>

\* Practice/Interactive Session

**II/IV B. Tech - FIRST SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT3T1	Digital System Design	3+1*	-	30	70	100	3
IT3T2	Classic Data Structures	3+1*	-	30	70	100	3
IT3T3	Probability and Statistics	3+1*	-	30	70	100	3
IT3T4	OOPS through C++	3+1*	-	30	70	100	3
IT3T5	Operating Systems Concepts	3+1*	-	30	70	100	3
IT3L1	Classic Data Structures Lab	-	3	25	50	75	2
IT3L2	OOPS through C++ Lab	-	3	25	50	75	2
IT3L3	Digital System Design Lab	-	3	25	50	75	2
IT3L4	Technical English	-	2	50	-	50	1
<b>Total</b>		<b>20</b>	<b>11</b>	<b>275</b>	<b>500</b>	<b>775</b>	<b>22</b>

\* Practice/Interactive Session

**II/IV B. Tech - SECOND SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT4T1	Advanced Data Structures	3+1*	-	30	70	100	3
IT4T2	Database Systems	3+1*	-	30	70	100	3
IT4T3	Java	3+1*	-	30	70	100	3
IT4T4	Automata and Compiler Design	3+1*	-	30	70	100	3
IT4T5	Computer System Architecture	3+1*	-	30	70	100	3
IT4L1	Database Systems Lab	-	3	25	50	75	2
IT4L2	Java Lab	-	3	25	50	75	2
IT4L3	Advanced Data Structures Lab	-	3	25	50	75	2
IT4L4	Soft Skills Course	-	2	50	-	50	1
<b>TOTAL</b>		<b>20</b>	<b>11</b>	<b>275</b>	<b>500</b>	<b>775</b>	<b>22</b>

\* Practice/Interactive Session

**III/IV B. Tech - FIRST SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT5T1	Unix	3+1*	-	30	70	100	3
IT5T2	Design Methods and Analysis of Algorithms	3+1*	-	30	70	100	3
IT5T3	Data Communications and Computer Networks	3+1*	-	30	70	100	3
IT5T4	Web Technologies	3+1*	-	30	70	100	3
IT5T5	Microprocessors and Micro Controllers	3+1*	-	30	70	100	3
IT5L1	Unix Lab	-	3	25	50	75	2
IT5L2	Microprocessors and Micro Controllers Lab	-	3	25	50	75	2
IT5L3	Web Technologies Lab	-	3	25	50	75	2
IT5L4	Advanced English Language Communication Skills Lab	-	3	25	50	75	2
<b>TOTAL</b>		<b>20</b>	<b>12</b>	<b>250</b>	<b>550</b>	<b>800</b>	<b>23</b>

\* Practice/Interactive Session

**III/IV B. Tech - SECOND SEMESTER**

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT6T1	Software Engineering	3+1*	-	30	70	100	3
IT6T2	Computer Graphics and Algorithms	3+1*	-	30	70	100	3
IT6T3	Object Oriented Analysis and Design	3+1*	-	30	70	100	3
IT6T4	Data Mining and Data Warehousing	3+1*	-	30	70	100	3
IT6T5	Free Elective	3+1*	-	30	70	100	3
IT6L1	OOAD Lab	-	3	25	50	75	2
IT6L2	DM Lab	-	3	25	50	75	2
IT6L3	Computer Graphics and Algorithms Lab	-	3	25	50	75	2
IT6L4	Personality Development Course	-	2	50	-	50	1
IT6L5	Seminar	-	2	50	-	50	1
<b>TOTAL</b>		<b>20</b>	<b>13</b>	<b>325</b>	<b>500</b>	<b>825</b>	<b>23</b>

\* Practice/Interactive Session

**Free Elective**

- IT6T5FE1 - Client Server Computing
- IT6T5FE2 - Embedded System Design
- IT6T5FE3 - Distributed Operating Systems
- IT6T5FE4 - Advanced Computer System Architecture
- IT6T5FE5 - Object Oriented Programming through Java



## IV/IV B. Tech - FIRST SEMESTER

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT7T1	Managerial Economics and Financial Accountancy	3+1*	-	30	70	100	3
IT7T2	Software Testing	3+1*	-	30	70	100	3
IT7T3	Mobile Computing	3+1*	-	30	70	100	3
IT7T4	Distributed Object Technologies	3+1*	-	30	70	100	3
IT7T5	Elective – I	3+1*	-	30	70	100	3
IT7T6	Elective – II	3+1*	-	30	70	100	3
IT7L1	Mobile Computing Lab	-	3	25	50	75	2
IT7L2	Distributed Object Technologies Lab	-	3	25	50	75	2
IT7L3	Mini Project/ Term Paper and Seminar	-	3	75	-	75	2
<b>Total</b>		<b>24</b>	<b>9</b>	<b>305</b>	<b>520</b>	<b>825</b>	<b>24</b>

\* Practice/Interactive Session

**Elective-I**

IT7T5A - Network Programming  
 IT7T5B - Cloud Computing  
 IT7T5C - Elements of Software Project Management  
 IT7T5D - Secure Software Engineering  
 IT7T5E - E- Commerce Technology

**Elective-II**

IT7T6A - Human Computer Interaction  
 IT7T6B - Service Oriented Architecture  
 IT7T6C - Software Design Patterns  
 IT7T6D - Image Processing  
 IT7T6E- Cryptography & Network Security

## IV/IV B. Tech - SECOND SEMESTER

Subject Code	Subject	Periods/Week		Marks			Credits
		Theory	Lab/ Practice	Internal	External	Total	
IT8T1	Biometrics	3+1*	-	30	70	100	3
IT8T2	Elective – III	3+1*	-	30	70	100	3
IT8T3	Elective – IV	3+1*	-	30	70	100	3
IT8PW	Project Work	-	9	100	200	300	9
<b>Total</b>		<b>12</b>	<b>9</b>	<b>190</b>	<b>410</b>	<b>600</b>	<b>18</b>

\* Practice/Interactive Session

**Elective – III**

IT8T2A - Information Retrieval Systems  
 IT8T2B - Social Networks and Semantic Web  
 IT8T2C - Business Intelligence  
 IT8T2D - Big Data Analytics

**Elective – IV**

IT8T3A - Artificial Intelligence  
 IT8T3B - Advanced Operating Systems  
 IT8T3C - Machine Learning  
 IT8T3D - Advanced Computer Networks

## 1/4 B.Tech - FIRST SEMESTER

**ENGINEERING MATHEMATICS-I**

(Common to all branches during I B.Tech, I Semester)

Course Code(s): CE1T1, ME1T1, CS1T1, IT1T1, EE1T1, EC1T1, AE1T1

**Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- The main purpose of this course is to provide students with skills in solving differential equations, evaluating improper integrals using beta and gamma functions.
- To prepare students for lifelong learning and successful careers using mathematical concepts of differential integral and vector calculus.

**Outcomes:**

- Acquire the knowledge of solving ordinary differential equations.
- Get the knowledge of mean value theorems and able to find maxima, minima of functions of two variables.
- Ability to apply double integrals to find area of the given region, triple integrals to find volume of the three dimensional objects.
- Get the knowledge of finding gradient of scalar point functions, curl, divergence of vector point functions.
- Get the knowledge of solving improper integrals using beta, gamma functions, able to find the curve of best fit for the given data by method of least squares.

**SYLLABUS:****UNIT-I**

Exact equations, orthogonal trajectories, applications to Newton's Law of cooling, Law of Natural growth and decay. Non-Homogeneous linear Differential equations of second and higher order with constant coefficients with RHS term of the type  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ , polynomials in  $X$ ,  $e^{ax} V(x)$ ,  $x V(X)$ .

**UNIT-II**

Differential calculus: Rolle's theorem, Lagrange's mean value theorem and Taylor's theorem (without proofs), Taylor's and Maclaurin's series for functions of one variable. Maxima and Minima of functions of two variables, Lagrange's method of multipliers.

**UNIT- III**

Multiple integrals -double and triple integrals-change of variables-Change of order of Integration.

**UNIT- IV**

Vector Differentiation: Gradient-Divergence-Curl and their related properties of sums -products- Laplacian and second order operators(proofs of identities not included) Vector Integration -Line integral-work done-Potential function-area-surface and volume integrals

Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems

**UNIT- V**

Curve Fitting- Fitting a straight line-Second degree curve- Exponential curve- power curve by method of least squares.

Gamma and Beta functions- properties- Evaluation of improper integrals (applications not included).

**Text Book:**

1. Higher Engineering mathematics by B.S. Grewal , khanna publishers

**References Books:**

1. Higher Engineering Mathematics, N.P. Bali. Laxmi Publications (P) Ltd.
2. Engineering Mathematics, B. V. Ramana, Tata Mc Graw Hill

## 1/4 B.Tech - FIRST SEMESTER

**ENGLISH FOR COMMUNICATION**

(Common to all branches during I B.Tech., I Semester)

Course Code(s): ME1T2, CE1T2, CS1T2, IT1T2, AE1T2, EE1T2, EC1T2

**Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks**  
**Semester end examination: 70 marks****Objectives:**

- To expose the students to various socio-cultural contexts
- To impart human values.
- To strengthen the writing skills.
- To enhance their communicative competence.
- To improve their vocabulary
- To make them well versed in grammar.
- To enhance their comprehensive ability.

**Outcomes:**

- Improved comprehensive ability
- Writing skills
- Acquiring human values.
- Knowledge of grammar.
- Cultural adaptability.

**Syllabus:****Unit -I**

1. Unity of minds-Abdul Kalam.
2. Communication  
Process of communication  
Types of communication-Verbal and nonverbal communication. Listening skills.
3. Synonyms, antonyms from the prescribed syllabus.

**Unit-II**

1. 'Next Sunday'-----R.K.Narayan
2. Tenses
3. Active/passive voice

**Unit -III**

1. 'The cop and the anthem'-----O.Henry
2. Direct/Indirect speech
3. Letter writing.

**Unit -IV**

1. 'Three Questions'----Leo Tolstoy
2. Degrees of comparison
3. Reading comprehension.

**Unit -V**

1. Kalpana Chawla-----Biographical sketch
2. Correction of sentences.

**Reference Books:**

1. Communication skills, Sanjay Kumar & Pushpa Latha oxford.
2. Communication skills, Leenasen.(PHI)
3. English for engineering students, G.V.L.N.Sharma.

4. An approach to communication skills, Bhanu Ranjan, Dhanpat Rai & co.
5. The craft of Business letter writing, Mathew ,Tata Mac Graw Hill.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>

## 1/4 B.Tech - FIRST SEMESTER

**ENGINEERING CHEMISTRY**

(Common to CSE, IT, CE, ECE during I B.Tech, I Semester)

(Common to EEE, AE, ME during I B.Tech, II Semester)

Course Code(s): CE1T3, CS1T3, IT1T3, EC1T4, AE2T3, EE2T3, ME2T3

**Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- To acquire knowledge about desalination of brackish water and treatment of municipal water.
- To gain the knowledge of conducting polymers, bio-degradable polymers and fiber reinforced plastics.
- To learn significance of green chemistry and green synthesis and the synthesis of nano materials.
- To understand mechanism of corrosion and preventive methods.
- To understand concept of semi conductivity, superconductivity and liquid crystal and solar energy.

**Outcomes:**

Students will be able to

- Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
- Replace metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.
- Produce economical green synthesis and new methods of synthesis of nano materials.
- Find appropriate metals or combination of metals and develop economical methods for minimizing corrosion.
- Bring the new ideas in converting solar energy into most needy electrical energy efficiently and economically to reduce the environmental pollution.

**Syllabus:****UNIT - I**

A)WATER TECHNOLOGY:- Introduction, Hardness of water, types of hardness(permanent and temporary)- Degree of hardness-Numericals-determination of hardness by EDTA Method-softening methods (lime-soda, ion exchange and zeolite process)

B)WATER TREATMENT:- Desalination-reverse osmosis-electrodialysis. Municipal water treatment-removal of micro organisms- by irradiation of UV radiation- bleaching powder process-chlorination-break point of chlorination-By using chloramine-By using ozone.

**UNIT-II**

A)POLYMERS:-Introduction - Types of polymers (addition and condensation)- mechanism of addition polymerization (free radical, ionic) – Classification - Methods of polymerisation – Stereospecific polymers - Ziegler Natta catalysis - Properties of polymers – Conducting Polymers-Engineering applications – Biodegradable polymers - Individual polymers(Preparation, Properties, Uses of Poly Styrene, PVC, PTFE, Bakelite's, Cellulose derivatives, PolyCarbonates).

B)PLASTICS :Types –Compounding of plastics- Moulding (Injection, compression, blow film extrusion and extrusion moulding)- Fiber reinforced plastics (Glass and carbon) – Bullet Proof Plastics– Properties of plastics – Engineering applications.

**UNIT - III**

A) GREEN CHEMISTRY: -Introduction – Principle of green chemistry, methods of green synthesis (aqueous phase, super critical fluid extraction method, phase transfer catalyst, micro wave induced method, ultra sound method).

B) NANO MATERIALS: -Introduction to Nanomaterials -preparation of few Nano materials (Carbon Nano Tubes, Fullerenes etc)-Properties of Nano materials- Engineering applications.

**UNIT - IV**

A) CORROSION :-Definition, causes and consequences of corrosion-mechanism of dry and wet corrosion-galvanic series, Factors influencing rate of corrosion passivity of metal, types of corrosion (galvanic, differential Aeration, pitting, crevice and stress corrosion).

B) CORROSION CONTROL:- Cathodic protection(sacrificial anodic protection and Impressed current cathodic protection) and Application of protective coating-metallic coatings (galvanization and tinning) organic coatings (paints (mechanism not required), varnishes, lacquers and enamels).

**UNIT - V**

A) SEMICONDUCTORS & SUPERCONDUCTIVITY SEMICONDUCTORS-Definition –Types of semiconductors (Stoichiometric, Non Stoichiometric ,Organic, Controlled Valency Semiconductors, Doping)-applications SUPERCONDUCTIVITY– Definition-Preparation – Properties –Engineering Applications.

B) LIQUID CRYSTALS & SOLAR ENERGY:- LIQUID CRYSTALS-Definition –Types - applications in LCD and Engineering Applications.

SOLAR ENERGY: Introduction – harnessing solar energy – solar heaters – photo voltaic cells – solar reflection –green house concepts.

**Text Books:**

1. A text book of Engineering chemistry, N.KrishnaMurthy N.Y.S.Murthy Dr.V.Anuradha.
2. A text book of Engineering chemistry II, D.Srinivasulu, Srivastava, Roliverma.
3. A text book of Engineering chemistry, JAIN & JAIN.
4. A text book of Engineering chemistry, C.P.Murthy, C.V.Agarwal. Andra Naidu.

**Reference Books:**

1. A text book of Engineering chemistry, S.S.DARA.
2. A text book of Engineering chemistry, Dr.C.Daniel Yesudian

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>



## 1/4 B.Tech - FIRST SEMESTER

**DISCRETE MATHEMATICS**

(Only for IT during I B.Tech, I Semester)

**Course Code: IT1T4****Credits:3****Lecture : 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period /week****Semester end examination: 70 marks****Objectives:**

- To know the notations used in the discrete mathematics associated with computer science and engineering.
- To learn the rudiments of elementary mathematical reasoning (elementary proofs; proofs by induction, Normal forms).
- To understand basic set-theoretical notions: relations, functions, graphs, equivalence relations, and orderings.
- To understand the fundamentals of counting and discrete probability.
- To understand the concept of Recurrence Relations

**Outcomes:**

Students will be able to

- Understand truth tables, the concept of logical equivalence and its relationship to equivalent logic circuits and Normal Forms.
- Apply rules in inference theory, and extend this to predicate calculus using quantifiers. Able to do simple proofs by mathematical induction. Know the properties of equivalence relations and partial orderings. Understand lattices and
- Hass'e Diagrams.
- Use graphs as representing relations, Identify isomorphism invariants of graphs, and algorithms for relations based on graphs or matrices (e.g. transitive closure).
- Know the fundamentals of counting and discrete probability.
- Solve the homogeneous, non-homogeneous relations using different methods.

**Syllabus:****UNIT- I**

Statements and Notation, Connectives- Negation, Conjunction, Disjunction, Conditional and Bi-conditional, Statement formulas and Truth Tables. Well formed formulas, Tautologies, equivalence of formulas, Duality Law, Tautological

Implications, Functionally Complete Sets of Connectives, Other connectives.

Normal Forms: Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms (PDNF), Principal Conjunctive Normal Forms (PCNF).

**UNIT-II**

Logical inferences, Methods of proof of an implication, First Order Logic and other methods of proof, Rules of Inference for Quantified Propositions, Mathematical induction.

Relations and Directed Graphs, Special properties of binary relations, Equivalence relation, Ordering relations, Lattices, and Enumerations.

**UNIT-III**

Operations on relations, Paths and Closures, Directed graphs and Adjacency matrices. Warshall's algorithm- Transitive closure. Basic concepts, Representation of Graphs, Isomorphism and sub graphs, Planar graphs, Multi graphs, Euler circuits, Euler Graphs and Hamiltonian graphs, Chromatic number

**UNIT-IV**

Basics of counting, Combinations and Permutations, Enumeration of combinations and permutations, Enumerating Combinations and Permutations with repetitions, Enumerating permutations with constrained repetitions, The Principle of Inclusion-Exclusion.

**UNIT -V**

Generating functions of Sequences, Recurrence relations, solving recurrence relations by Substitution and Generating functions, the method of Characteristic roots, Solutions of Inhomogeneous Recurrence Relations.

**Text Books:**

1. Joe L. Mott. Abraham Kandel and Theodore P.Baker, Discrete Mathematics for Computer Scientists & Mathematicians. PHI, 2<sup>nd</sup> Edition (For Units II to V).
2. J P Trembly and R Manohar , Discrete Mathematical Structures with Applications to Computer Science. TMH (For Unit I).

**Reference Books:**

1. Swapan kumar Chakraborty, Bikash Kanti Sarkar, Discrete Mathematics. Oxford.
2. Dr.J Rajendra Prasad, T.Rama Rao, A.Madana Mohana Rao, Mathematical Foundations of Computer Science.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>

## 1/4 B.Tech - FIRST SEMESTER

**BASIC ELECTRICAL ENGINEERING**

(Common to CSE, IT during I B.Tech, I Semester)

**Course Code(s): CS1T5, IT1T5****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- To impart the basic knowledge about the Electric circuit and magnetic circuits.
- To understand the working of various DC and AC motors.
- To know the operation of transformer.
- To know the various electrical measuring instruments.

**Outcomes:**

Students will be able to

- Basic knowledge about the Electric and Magnetic circuits.
- Understands the working of various DC and AC Motors.
- Understands the operation of transformer.
- Analyze the working of electrical measuring instruments.

**Syllabus:****UNIT-I**

Introduction to Electrical Engineering: Basic Definitions, ohm's law, Voltage and current source. Kirchhoff's laws, basic circuit components, series parallel resistance circuits, mesh analysis and nodal analysis (only on independent sources). Star-Delta/Delta-Star conversion, simple problems.

**UNIT-II**

Magnetic Circuits: Basic definitions ,Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction, analogy between electric and magnetic circuits, self inductance and mutual inductance, coefficient of coupling, coils connected in series and parallel, Types of induced EMF's, Simple problems.

**UNIT-III**

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

**UNIT-IV**

DC Machines: Principle of operation of dc motor, Torque production in a dc motor, Types of DC motors, three point starters.

A.C Machines: Construction and Principle of operation of three phase induction motor, slip, rotor frequency and torque (simple problems).

**UNIT-V**

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

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

**Text Books:**

1. Principles of Electrical Engineering, V.K Mehta, S.Chand Publications.
2. Basic Electrical Engineering, M.S.Naidu and S. Kamakshiah – TMH.

**Reference Books:**

1. Theory and Problems of Basic Electrical Engineering, D.P.Kothari & I.J. Nagrath PHI.
2. Basic Electrical Engineering, T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

## 1/4 B.Tech - FIRST SEMESTER

**INTRODUCTION TO INFORMATION TECHNOLOGY**

(Only for IT during I B.Tech., I Semester)

**Course Code: IT1T6****Credits:3****Lecture : 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide an overview of computer system
- To introduce the fundamentals of computer programming languages, operating system, database terminology.
- To introduce the basics of information technology, its role and present scenario and basics of multimedia.
- To introduce network concepts, internet tools and search engines.
- To elaborate on future trends of information technology.

**Outcomes:**

Students will be able to

- Identify system components and utilize computer hardware.
- Describe basics of programming, components of a database and operating system.
- Understand the strategic importance of information technology.
- Understand the fundamental terminology of data communication and internet tools.
- Recognize the applications of IT in various sectors and future trends.

**Syllabus:****UNIT-I**

Computer Basics- Introduction, Evolution of Computers, Generations of Computers, Classification of Computers, The Computer system, Applications of Computers.

Computer organization and Architecture- Introduction, Central Processing Unit, Types of Number Systems.

Computer Memory and Storage- Introduction, Memory Hierarchy.

Input Output Media- Introduction.

**UNIT-II**

Computer Programming and Languages- Introduction, Algorithm, Programming Paradigms, characteristics of a Good Program, Programming Languages, Generations of Programming Languages, Features of a Good Programming Language.

Operating System- Introduction, Operating System Definition, Evolution of Operating System, Types of Operating Systems.

Database Fundamentals- Introduction, Database Definition.

**UNIT-III**

Information Technology Basics- Introduction, Information, Technology, Information Technology, Present scenario, Role of Information Technology, Information Technology and the Internet

Multimedia:- Introduction, Multimedia- definition, Multimedia Applications.

**UNIT-IV**

Computer Networks- Computer Network, Network Topologies, Network Devices

Internet- Introduction, Evolution of Internet, Basic Internet Terms, and Getting connected to the Internet, Internet Applications

Internet Tools- Introduction, Web Browser, Browsing Internet using Internet Explorer,

E-mail Address Structure, Search engines

**UNIT-V**

Current and Future Trends in IT- Introduction, Electronic commerce, Electronic Data Interchange, Smart card, Internet Protocol Television, Blogging, Radio Frequency Identification, Imminent Technologies.

**Text Book:**

1. Introduction to Information Technology-ITL Education solutions limited, PEARSON.

**Reference Book:**

1. Fundamentals of Information Technology, 2<sup>nd</sup> Edition, Alexis Leon, Mathews Leon, (Leon VIKAS)

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>



## 1/4 B.Tech - FIRST SEMESTER

**ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

(Common to CSE, IT, EEE, CE, ECE during I B.Tech, I Semester)

(Common to ME, AE during I B.Tech., II Semester)

Course Code(s): CE1L3, CS1L1, IT1L1, EE1L1, EC1L1, ME2L2, AE2L2

**Credits: 2****Lab: 3 Periods/week****Internal assessment: 25 marks****Semester end examination: 50 marks****Objectives:**

- To improve the communicative ability.
- To enhance the general conversational skills in different socio-cultural contexts.
- To strengthen their professional skills.
- To instill confidence and make them competent enough to express themselves fluently.
- To expose the students to various spoken skills.

**Outcomes:**

- Better pronunciation and accent
- Ability to use functional English
- Improved comprehensive ability
- Enhanced analytical skills
- Good negotiation skills.

**Syllabus:****Task 1: Phonetics**

Introduction to the sounds of English.  
Phonetic transcription of simple words.  
Word stress or accent.  
Intonation.

**Task II: Spoken skills**

JAM  
Public speaking  
Debate

**Task III: Conversation skills**

Introducing  
Extending Invitations  
Apologizing  
Lodging complaints.

**Task IV: - Describing**

Describing an object  
Describing a process  
Describing situations

**Task V: Group Discussion**

Dynamics of Group Discussion  
Various strategies  
Discussion on various topics

**Reference books:**

1. Everyday dialogues in English-----Robert J.Dixon.
2. Speak well-----orient black swan.

## 1/4 B.Tech - FIRST SEMESTER

**IT WORKSHOP**

(Common to CE, ME, CSE, IT during I B.Tech., I Sem)

(Common to AE, ECE during I B.Tech., II Sem)

Course Code(s): CE1L2, ME1L2, CS1L2, IT1L2, AE2L3, EC2L1

**Credits: 2****Internal assessment: 25 marks****Semester end examination: 50marks****Lab: 3 Periods /week****Objectives:**

To provide students with hands-on experience in basic hardware, productivity tools and basic operating system installations.

**Outcomes:**

Students will be able to

- Identify the basic computer peripherals.
- Gain sufficient knowledge on assembling and disassembling a PC.
- Learn the installation procedure of Windows and Linux OS.
- Acquire knowledge on basic networking infrastructure.
- Learn productivity tools like Word, Excel and Power point.
- Acquire knowledge on basics of internet and worldwide web.

**Task 1:**

Identification of the peripherals of a computer: To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions. Description of various I/O Devices

**Task 2:**

A practice on disassembling the components of a PC and assembling them.

**Task 3:**

Basic DOS commands, Installation of MS windows.

**Task 4:**

Introduction to Linux- Installation Procedure, Basic Linux Commands.

**Task 5:**

Hardware Troubleshooting (Demonstration): Identification of a problem and fixing the solution (improper assembly or defective peripherals).

Software Troubleshooting (Demonstration): Identification of a problem and fixing the PC for any software issues.

**Task 6:**

Demonstrating Importance of Networking, Transmission Media, Networking Devices Gateway, Routers, Hub, Bridge, NIC, Bluetooth Technology, Wireless Technology, Modem, DSL, Dialup Connection.

**Task 7:**

MS Word Orientation: Accessing, overview of toolbars, saving files, Using help and resources, rulers, formatting ,Drop Cap , Applying Text effects, Using Character Spacing, OLE in Word, using templates, Borders and Colors, Inserting Header and Footer, Using Date and Time option, security features in word, converting documents while saving

**Task 8:**

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, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

**Task 9:**

Using spread sheet features of EXCEL including the macros, formulae, pivot tables, graphical representations Creating a Scheduler - Features to be covered:-Gridlines, Format Cells, Summation, auto fill, Formatting Text LOOKUP/VLOOKUP

**Task 10:**

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

**Task 11:**

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, Hyperlinks, Inserting –Images, Clip Art, Tables and Charts in PowerPoint.

Focusing on the power and potential of Microsoft power point. 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, OLE in PPT.

**Task 12:**

Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email, Customizing web browsers using bookmarks, search toolbars and pop up blockers, Search engines and their usage.

**Reference Books:**

1. Computer Fundamentals, Anita Goel, Pearson
2. Information Technology Workshop, 3<sup>rd</sup> Edition, G Praveen Babu, M V Narayana BS Publications.
3. Introduction to Information Technology-ITL Education Solution Limited- Pearson.
4. Fundamentals of Information Technology, 2<sup>nd</sup> Edition, Alexis Leon, Mathews Leon, (Leon Vikas).

1/4 B.Tech - FIRST SEMESTER

**ENGINEERING GRAPHICS LAB**

(Common to CSE, IT, EEE during I B. Tech, I Semester)

Course Code(s): CS1L3, IT1L3, EE1L3

**Credits: 2****Internal assessment: 25 marks****Semester end examination: 50 marks****Lab: 3 Periods/week****Objectives:**

- To improve imagination skills.
- Increase ability to communicate with people.
- Learn to sketch and take field dimensions.
- Learn to take data and transform it into graphic drawings.
- Learn basic engineering drawing formats.
- Prepare the student for future Engineering positions.

**Outcomes:**

Students will be able to

- Get acquainted with the knowledge of various lines, geometrical constructions and construction of various kinds of scales, and Ellipse.
- Improve their imagination skills by gaining knowledge about points, lines and planes.
- Become proficient in drawing the projections of various solids.
- Gain knowledge about orthographic and isometric projections.

**Syllabus:****UNIT - I**

Polygons-Construction of Regular Polygons using given length of a side; Ellipse-General method and Oblong Methods for Construction of ellipse; Scales-Plain, Vernier and Diagonal Scales. Introduction to Orthographic Projections; Projections of Points; Projections of Straight Lines parallel to both planes; Projections of Straight Lines-Parallel to one and inclined to other plane.

**UNIT - II**

Projections of Straight Lines inclined to both planes, determination of true lengths, angle of inclinations and traces.

**UNIT - III**

Projections of Planes; Regular Planes Perpendicular / Parallel to one Reference Plane and inclined to other Reference Plane; inclined to both the Reference Planes.

**UNIT - IV**

Projections of Solids-Prisms, Pyramids, Cylinders and Cones with the axis inclined to one Plane.

**UNIT - V**

Conversion of Isometric Views to Orthographic Views.

Conversion of Orthographic Views to Isometric Projections and Views.

**Text Book:**

1. Engineering Drawing by N.D. Bhat, Chariot publications

**Reference Books:**

- a) Engineering Drawing by M.B. Shah and B.C. Rana, Pearson publishers
- b) Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill Publishers
- c) Engineering Graphics for Degree by K.C. John, PHI Publishers

1/4 B.Tech - SECOND SEMESTER

**ENGINEERING MATHEMATICS -II**

(Common to all branches during I B.Tech, II Semester)

Course Code(s): CE2T1, ME2T1, CS2T1, IT2T1, AE2T1, EE2T1, EC2T1

**Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- After completion of this course engineers will be able to apply the concepts of matrices, Laplace transforms, Fourier series, Fourier transforms in solving engineering problems.
- Linear algebra in the course cover material which is essential to anyone who does mathematical computation in Engineering and sciences.

**Outcomes:**

- students able to solve system of Linear equations, be familiar with properties of matrices, find the inverse, Eigen values and Eigen vectors and use them in diagonalization,
- Acquire knowledge in Laplace transforms, inverse Laplace transforms and how to get a solution of differential equations by using Laplace transforms.
- Get knowledge of expanding a function in terms of sine and cosine functions' in Fourier series and also to get knowledge in Fourier transforms.
- Get knowledge in Z-transforms, inverse Z-transforms, solving difference equations

**Syllabus:****UNIT - I**

Matrices and Linear systems of equations: Rank-Echelon form, Normal form-definition of a vector, linear independence – Solution of Linear System of equations – Direct Methods- Gauss Elimination - Gauss Jordan and Gauss Seidal Methods.

**UNIT - II**

Eigen values - Eigen vectors: Eigen values - Eigen vectors - Properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem- some applications of eigen value problems- Diagonalization of a matrix.

**UNIT - III**

Laplace transforms & Inverse Laplace transforms: Laplace transforms: Laplace transforms of standard functions –Shifting Theorems, Transforms of derivatives and integrals – Unit step function –Dirac's delta function.

Inverse Laplace transforms: Convolution theorem - Application of Laplace transforms to ordinary differential equations with given initial conditions.

**UNIT - IV**

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

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

**UNIT - V****Z-transforms:**

Introduction, properties of Z-transforms-initial value theorem-final value theorem-inverse Z-transforms-applications to difference equations.

**Text Books:**

1. Higher Engineering Mathematics – Khanna Publishers – B.S. Grewal – 42<sup>nd</sup> Edition.
2. Advanced Engineering Mathematics – Wiley – Erwin Kreyszig- 8<sup>th</sup> Edition.

**Reference Book:**

1. Engineering Mathematics Vol-II, Iyengar, T.K.V, Krishna Gandhi, et.al S.Chand Co. New Delhi.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>



## 1/4 B.Tech - SECOND SEMESTER

**PROFESSIONAL ETHICS**

(Common to all branches during I B.Tech, II Semester) Course Code(s): CE2T2, ME2T2, CS2T2, IT2T2, AE2T2, EE2T2, EC2T2

**Credits: 3****Lecture: 3 Periods/week**

**Internal assessment: 30 marks**  
**Semester end examination: 70 marks**

**Objectives:**

- To inculcate the sense of social responsibility.
- To develop a firm ethical base
- To make the students realize the significance of ethics in professional environment.

**Outcomes:**

Students will be able to

- Become Ethical, social and environmental awareness
- Got Engineering's rights and responsibilities act in morally definable ways towards moral commitment and responsible conduct
- Integrating academic learning with experiment learning in a profession

**Syllabus:****Unit -I**

Profession----Definition  
 Three types of ethics.  
 Engineering ethics  
 Rights and responsibilities of an engineer.

**Unit -II**

Evolution of engineering ethics  
 Code of ethics  
 Kohlberg's theory  
 Gilligan's theory

**Unit -III**

Engineering as social experimentation  
 Engineer's social responsibility

**Unit -IV**

Computer ethics  
 Ethical hacking  
 Privacy

**Unit -V**

Environmental ethics. Livable environment  
 Technology assessment.

**Reference books:**

1. Ethics in Engineering: Mike W. Martin Roland, Mac Grow Hill. Schinzinger
2. Engineering Ethics, M. Govindarajan, S. Natarajan & V.S.Senthil Kumar. Eastern economy Edn.PHI
3. Engineering Ethics, Harris pitch and Rabbins, cengage.
4. Ethics in Engineering Practice and Research, Cambridge Caroline whit back.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>

**ENGINEERING PHYSICS**

(Common to EEE, AE, ME, ECE during I B.Tech, I Semester)

(Common to CSE, IT, CE during I B.Tech, II Semester)

**Course Code (s): EE1T3, AE1T3, ME1T3, EC1T3, CS2T3, IT2T3, CE2T3****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- The concepts of Quantum Physics.
- The theoretical picture about a crystal structure.
- How to determine the different crystal structures by using X-diffraction techniques.
- The properties of different types of solids and to have the knowledge about the energy-band diagram in the materials.
- The advanced topics such as lasers, fibre optics and nano- materials.

**Outcomes:**

Students will be able to

- Acquire the knowledge of Quantum physics and basics about the atomic scale of the systems.
- Learn crystal structure and the X-ray diffraction Techniques and could differentiate the different types of crystals.
- Get the knowledge about the different types of solids and will know the use of appropriate solids as per requirement.
- Get the knowledge about advanced topics and will be ready to the upcoming developments in the Engineering Physics.

**Syllabus:****UNIT-I**

QUANTUM PHYSICS: Planck's black body theory of radiation - Debroglie hypothesis – Properties of matter waves –G.P. Thomson experiment– Davison and Germer experiment – Heisenberg uncertainty principle –Time independent & Time dependent Schrödinger wave equation – physical significance of wave function – Particle in one dimensional potential box.

**UNIT-II**

Crystal Structure & X-ray Diffraction: Introduction – Space lattice – Basis - unit cell - Lattice parameters – Bravais lattices – Crystal systems – Structure and packing fraction of simple , bcc , fcc crystals. Directions and planes in crystals – miller indices –Distance between successive parallel planes- Diffraction of X rays – Bragg's law –Laue method-Powder method.

**UNIT-III**

PHYSICS OF SOLIDS-I: Classical free electron theory-Quantum free electron theory- Fermi Dirac distribution function-Bloch theorem- Kronig penny model(qualitative treatment)- Classification of materials. Dielectric constant – electronic, ionic and orientation polarizations–internal fields in solids – Clausius Mossotti relation –causes of dielectric breakdown.

**UNIT-IV**

PHYSICS OF SOLIDS-II: Introduction – intrinsic semiconductor and carrier concentration- Fermi level in intrinsic semiconductor conductivity in intrinsic semiconductor– extrinsic semiconductor – carrier concentration- Fermi level in extrinsic semiconductor – Drift and diffusion current – Einstein's relations – Direct and Indirect band gap semiconductors. Origin of magnetic moment – classification of magnetic materials – Hysteresis curve

– soft and hard magnetic materials- applications.

### **UNIT-V**

**ADVANCED PHYSICS:** Lasers Characteristics of lasers – spontaneous and stimulated emission of radiation – population inversion – pumping – Ruby, Helium-Neon & Semiconductor lasers- Applications of lasers. Fiber optics Principle of optical fiber – Acceptance angle and numerical aperture – Attenuation in optical fibers – applications of optical fibers.

Introduction – Surface to volume ratio- Quantum confinement effect- properties and preparation of nanomaterial – nanotubes – SWNT- MWNT- Applications of nanomaterials.

#### **Text Books:**

1. Solid state Physics by S.O.Pillai. (New Age International Publications)
2. Engineering physics by M.R.Srinivasan (New Age International Publications).

#### **Reference Books:**

1. Engineering physics by D.K.Bhattacharya and A.Bhaskaran. (Oxford Publications).
2. Engineering physics by R.K Gaur and S.L. Gupta, Dhanpat Rai Publications

#### **e-Learning Resources:**

1. <http://nptel.ac.in/courses.php> <http://jntuk-coeerd.in/>

## 1/4 B.Tech - SECOND SEMESTER

**ENVIRONMENTAL STUDIES**

(Common to EEE, CE, ME, CSE during I B.Tech., I Semester)

(Common to IT, AE, ECE during I B.Tech., II Semester)

**Course Code(s): CEIT4, MEIT4, CSIT4, EE1T4, IT2T4, AE2T6, EC2T4****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Semester end examination: 70 marks****Objectives:**

- To develop an awareness, knowledge, and appreciation for the natural environment.
- To understand different types of ecosystems exist in nature.
- To know our biodiversity.
- To understand different types of pollutants present in Environment.
- To know the global environmental problems.

**Outcomes:**

Students will be able to

- Develop an appreciation for the local and natural history of the area.
- Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of peoples movements focusing on environment.
- Create awareness among the youth on environmental concerns important in the long term interest of the society
- Develops skills required for research and analyze environmental issues scientifically and learn how to use those skills in filed situations for sustainable environment.

**Syllabus:****UNIT – I**

Natural Resources: A)Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people.

Water resources - Use and over utilization of surface and ground water –Floods, drought, conflicts over water, dams - benefits and problems.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

B)Energy resources: Renewable and non-renewable resources-Natural resources and associated problems Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies.

Mineral resources: Use and exploitation problems, environmental effects of extracting and using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Organic Farming, Bio fertilizers and Bio-pesticides

**UNIT – II**

A) Ecosystems: Definition, Scope and importance, Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem -Ecological succession. - Food chains, food webs and ecological pyramids, Flow of energy, Bio-geochemical cycles, Bio-magnification, Ecosystem values, Services and carrying capacity.

B) Biodiversity and its conservation:

Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India, India as a mega-diversity nation, Hot-spots of biodiversity, Value of biodiversity:

consumptive use, productive use, social, ethical, aesthetic, option values and ecosystem service values. Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

### UNIT - III

A) Environmental Pollution: Definition, Cause, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards

B) Solid waste Management: - classification and characters of solid waste, factors affecting waste generation, collection and disposal of solid waste. E- waste and management. Role of an individual in prevention of pollution. – Pollution case studies.

### UNIT – IV

A) Global Environmental problems and Global efforts:

Green house effect, Green house gasses, Global warming, Climate change and their impacts on human environment, ozone layer depletion. International conventions / protocols: Earth summit, Kyoto protocol & Montreal protocol.

B) Towards Sustainable Future: From Unsustainable to Sustainable development, Population and its explosion, Urban problems related to energy, Consumerism and waste products, Role of IT in Environment and human health. Value Education. HIV/AIDS, Environmental ethics, Concept of green buildings and Clean Development Mechanism.

### UNIT - V

A) Environmental Impact Assessment & Management plans, Environmental Law: Definition of impact, Classification of impacts, Impacts of different components such as: human health, resources, air, water, flora & fauna. Environment management plans (EMP): Technological solutions for pollution control, Green-belt-development, Rain water harvesting, Remote sensing and GIS methods.

Environmental law (Air, Water, Wild life, Forest Acts): Objectives of Acts, Institutional arrangements for Implementation and Regulation.

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

### Text Books:

1. Text of Environmental studies by Anubha Kaushik, New age publishers, 4<sup>th</sup> Edition.
2. Erach Bharucha, 2010 “Text Book of Environmental Studies”, University Grants Commission, Universities Press (India) Pvt.Ltd., Hyderabad

### Reference Books:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Text Book of Environmental Science and Engineering by G.Tyler Miller Jr, 2006 Cengage learning
3. Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

### e-Learning Resources:

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>

## 1/4 B.Tech - SECOND SEMESTER

**BASIC ELECTRONICS ENGINEERING**

(Common to CSE, IT during I B.Tech., II Semester)

**Course Code(s): CS2T5, IT2T5****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1 Period /week****Semester end examination: 70 marks****Objectives:**

- To study in detail about construction of several electronic devices.
- To analyse the characteristics of various electronic devices and circuits.
- To understand the internal structure and characteristics of Op-amp.
- To learn about the linear and non-linear applications of Op-amp.

**Outcomes:**

Students will be able to

- Understand the semiconductor physics of the intrinsic, p and n materials.
- Understand the function and operation of diodes, transistors and amplifiers.
- Students will be aware of the architecture, functions & their applications of IC 741 OP-Amp

**Syllabus:****UNIT – I**

Semi Conductors and Diodes: Conductors, Semiconductors, Intrinsic Semiconductors, Extrinsic Semi Conductors. Diode Theory: Basic Ideas, The ideal Diode, Forward and Reverse Bias, Diode Equation, Volt-Ampere Characteristic. Special diodes: symbol of zener diode, operation, V-I characteristics, symbol of photo diode, working principle, LED symbol and principle.

**UNIT – II**

Rectifiers: Half-wave Rectifier, Full-wave and Bridge Rectifier, derivation of Ripple factor, efficiency of Half-wave, full-wave and Bridge rectifiers. Merits and demerits of Half-wave, full-wave and Bridge rectifiers, Comparisons of rectifiers.

**UNIT- III**

Bipolar Junction Transistors: Symbols of pnp and npn transistors and their working principles, Transistor currents, input and output characteristics of Common base configuration, Common Emitter configuration Transistor Switch, Amplifiers: working principles of Common base amplifier, Common Emitter amplifier, Common collector amplifier and their applications

**UNIT- IV**

Characteristics of Op-Amps: Introduction to OP-amp, Op-amp Block Diagram, ideal and practical Op-amp specifications, 741 op-amp & its features, Op-Amp parameters & Measurement, Input & Out put off set voltages & currents, slew rates, CMRR, PSRR.

**UNIT-V**

Applications of Op-Amps: Inverting and Non-inverting amplifier, Integrator and differentiator, Comparators.

**Text Books:**

1. Electronic Principles, Albert Malvino and David J Bates, 7th Edition, Tata McGraw –Hill.
2. Electronic Devices and Circuits Theory, Boylestad, Pearson Education, 8th Edition, September 2011.
3. Op-Amps and Linear Integrated Circuits , - Ramakanth A. Gayakwad, PHI, 4th Edition, 2009
4. Linear Integrated Circuits – D. Roy Chowdhury, New Age International Pvt.Ltd., 2nd Edition, 2003.

**Reference Books:**

1. Electronic Devices and Circuit Theory, Robert L.Boylestad and Louis Nashelsky, 10th Edition(2010), Pearson/PHI
2. Electronic Devices and Circuits, David A.Bell, Oxford, 5th edition, 2009.
3. Electronic Devices and Circuits, S.Salivahanan, Kumar, Vallavaraj, TATA McGraw Hill, 2nd Edition, 2003.
4. Operational Amplifiers & Linear ICs, David A Bell, Oxford Uni. Press, 3rd Edition, 2005.

**e-Learning Resource:**

1. <http://nptel.ac.in/courses.php> <http://jntuk-coeerd.in/>

## 1/4 B.Tech - SECOND SEMESTER

**C PROGRAMMING**

(Common to ECE, AE during I B.Tech., I Semester) (Common to CSE, EEE, CE, ME, IT during I B.Tech., II Semester)

Course Code(s): AE1T4, EC1T5, EE2T6, CE2T6, ME2T6, CS2T6, IT2T6

**Credits : 3**

**Lecture : 3 Periods/week**

**Internal Assessment : 30 marks**

**Practice/Interaction: 1Period/Week**

**Semester end examination:70marks**

**Objectives:**

- Learn the structure, syntax and semantics of C programming.
- Learn different control structures like decision control, loop control and arrays.
- Learn the modular programming concepts and storage classes.
- Learn the limitations of basic data types and learn the concepts of derived data types and user defined data types.
- Learn how to perform various FILEI/O.

**Outcomes:**

Students will be able to

- Understand the fundamentals of C programming.
- Choose the decision making statements, loops and arrays to solve the problem.
- Use functions to solve the given problem.
- Allocate dynamic memory using pointers.
- Apply the structures, unions and files Operations in a specific need.

**Syllabus:****UNIT –I**

**BASICS AND INTRODUCTION TO C:** Basics of Computer, Introduction to C, About ANSI C Standard, Machine, Assembly and High-level Language, Assembler, Compiler and Interpreter, Structure of a C program, Programming Rules, Executing the C Program, Standard Directories, Advantages of C, Header Files, Flow Chart, Algorithm, Analyzing Algorithm, Classification of Algorithms.

**THE C DECLARATIONS:** The C-Character set, Delimiters, Types of Tokens, The C keywords, Identifiers, Constants, Variables, C Data types, dynamic initialization, type modifiers, type conversions, constant and volatile variables. Properties of Operators, Operator Priority, comma and conditional operators, arithmetic, relational, assignment operators and expressions, logical, bitwise operators. Input and output in c: Formatted and Unformatted functions.

**UNIT-II**

**DECISION STATEMENTS:** The if statement, if-else, nested if else, if-else-if ladder, break, continue, goto, Switch statement, nested switch case, Switch case and nested ifs. **LOOP CONTROL:** for loop, nested for loop, while, do-while, do-while statement with while loop. **ARRAYS:** Array initialization, array terminology, characteristics of an array, 1-D array and its operations, predefined streams, 2-D arrays and operations, Multi -dimensional arrays. **STRINGS:** Declaration and initialization of string, string standard functions, string conversion functions, memory functions, application of strings.

**UNIT-III**

**FUNCTIONS:** Basics, function definition, return statement, types of functions, call by value ,call by reference, function as an argument, Functions with operators, Function and Decision Statements, Functions and loop Statements, Functions with arrays and Pointers,



Recursion-Types of Recursion, Rules for Recursive Function, Recursion versus Iterations, Advantages and Disadvantages of Recursion, Efficiency of Recursion, Library Functions.

STORAGE CLASS: Variable Lifetime, Automatic Variables, External Variables, Static Variables, Register Variables.

#### **UNIT-IV**

POINTERS: Features of pointers, pointers and address, pointer declaration, void pointers, arithmetic operations with pointers, pointers and arrays, array of pointers, pointers to pointers, pointers and strings. Dynamic memory allocation, memory models, memory allocation functions.

PREPROCESSOR DIRECTIVES:

The #define Directive, Undefining a Macro, Token Pasting and Stringizing Operators, The #include Directive, Conditional Compilation, The Predefined Macros in ANSI and Turbo-C, Standard I/O Predefined Streams in stdio.h, The Predefined Macros in ctype.h.

#### **UNIT -V**

STRUCTURE AND UNION: Features of Structures, Declaration and initialization of Structures, Structure within Structure, Arrays of Structure, Pointer to Structure, Structure and functions, typedef, Bit fields, Enumerated Data Type, Union, Union of Structures.

FILES: Streams and File Types, Steps for File Operations, FILE I/O, Structures Read and Write, Other file function, Command line Arguments, Application of command line arguments, Environment variables.

#### **Text book:**

1. Programming in C, by Ashok N.Kamthane, 2<sup>nd</sup> Edition, Pearson publications, 2011.

#### **Reference books:**

1. Programming in ANSI C, 5<sup>th</sup> Edition by E. Balaguruswamy, McGraw-Hill publications.
2. "A first book of ANSI C", 3<sup>rd</sup> Edition, by Gray J .Brosin, cengagedelmar Learning India P.ltd publications.
3. Problem Solving with C by M.T Somashekara PHI publications.
4. C Programming Language", 2<sup>nd</sup> Edition by Brain W.Kernighan & Dennis Ritchie, PHI publication

#### **e-Learning Resources:**

1. <http://nptel.ac.in/courses.php>
2. <http://jntuk-coeerd.in/>

1/4 B.Tech - SECOND SEMESTER

**ENGINEERING PHYSICS & CHEMISTRY LAB**

(Only for ECE during I B.Tech., I Semester)  
 (Common to CSE, IT, EEE during I B.Tech., II Semester)

**Course Code(s): EC1L2, CS2L1, IT2L1, EE2L1****Credits: 2****Lab: 3 Periods/week****Internal assessment: 25 marks****Semester end examination: 50 marks****Objectives:**

- Knowledgeable in different concepts of physics such as Properties of Matter, Sound, Electricity, Optics and Electronics by explaining through experiments.
- Familiar with quality and parameters of water samples, useful for drinking effluent treatment and agriculture purposes.
- Aware of preparation of some plastic material and corrosion kinetics useful in industries.
- Know about the measuring the properties of the lubricants which are industrially useful.

**Outcomes:**

Students will be able to

- Determine the physics parameters such as rigidity modulus, refractive index, velocity of sound, time constant, magnetic induction, radius of curvature of a lens, energy gap, breakdown voltage of zener, wavelength of a monochromatic source, Numerical aperture and Attenuation in optical fiber.
- Learn hardness, alkalinity, turbidity, D.O of water sample students can understand different methods of water treatment.
- Know nature of the soil from PH values the types of fertilizers and pesticides to be used can be decided
- Know the purity of water which is useful for drinking and industrial purposes.
- Know the preparation of Bakelite and understand to applications in industries.

**Syllabus:****ENGINEERING PHYSICS**

ANY SIX OF THE FOLLOWING:

**MECHANICS:**

1) Determine the rigidity modulus of the material of the wire using torsional Pendulum

**SOUND:**

2) Determine the velocity of sound by volume resonator method.

**OPTICS:**

3) Determine the wavelength of a source by normal incidence method using diffraction grating

4) Determine the radius of curvature of a plano convex lens by forming Newton's Rings

5) Determine the refractive index of the material of the prism (minimum deviation method) using spectrometer.

**ELECTRICITY AND MAGNETISM:**

6) Study the variation of magnetic field along the axis of a solenoid coil using Stewart – Gee's apparatus.

7) Determine the time constant for a C-R circuit.

**ELECTRONICS:**

- 8) Study of characteristic curves of a zener diode to determine its break down Voltage
- 9) Determine band gap of semiconductor using a p-n junction diode.
- 10) Draw the characteristic curves and determine thermoelectric coefficient of a Thermistor.
- 11) Determine the Numerical Aperture of an optical fibre.
- 12) Determine the attenuation in the optical fibre.

**ENGINEERING CHEMISTRY**

1. Determination of Total Hardness of water sample using EDTA.
2. Determination of Total alkalinity of water sample.
3. Determination of D.O in water.
4. Measurement of Turbidity of water sample.
5. pH of Soil and fruits.
6. Preparation of Phenol-Formaldehyde resin.

## 1/4 B.Tech - SECOND SEMESTER

**BASIC ELECTRONICS ENGINEERING LAB**

(Common to CSE, IT during I B.Tech., II Semester)

**Course Code: CS2L2, IT2L2****Credits: 2****Lab: 3 Periods /week****Internal assessment: 25 marks**  
**Semester end examination: 50 marks****Objectives:**

- To study basic electronic components.
- To observe characteristics of electronic devices.
- To get the practical exposer of the Op-amp applications.
- To study the practical limitations of the Op-amp.
- To study Linear & Non linear wave shaping.

**Outcomes:**

Students will be able

- To apply the concepts and analytical principles to analyze electronic (diodes, transistors) circuits.
- To Understanding of the operation diodes and transistors in order to build circuits.
- To learn to the characteristics of Transistor.
- To learn the basics of Amplifiers.
- The students are able to design Op-amp circuits.

**Part I**

1. The identification & Testing of Electronic component like R,L,C, Diodes, Transistors etc.
2. Study of CRO, function generator, regulated power supply etc.,

**Part II**

Any TEN Experiments

1. Diode Characteristics (Si) a) Forward Bias b) Reverse Bias
2. Zener Diode Characteristics
3. Half Wave rectifier with & without filter
4. Full Wave rectifier with & without filter
5. Transistor CB Characteristics (I/P & O/P)
6. Transistor CE Characteristics (I/P & O/P)
7. CE Amplifier
8. CC Amplifier
9. CB Amplifier
10. Op-amp inverting amplifiers (OP -AMP Applications) – Adder, Subtractor, Comparator Circuits.
11. Op-amp non-inverting amplifiers (OP -AMP Applications) – Adder, Subtractor, Comparator Circuits
12. Op-amp inverting amplifier for desired gain and bandwidth.

**Reference Books:**

1. Electronic devices & circuits by B.L.Theraja,R.S.Sedha,S.Chand publications
2. Electronic devices & circuits by Robert L.Boylested
3. Linear Integrated Circuits by D. Roy Chowdhury, New Age International Pvt.Ltd., 2<sup>nd</sup> Edition, 2003.

## 1/4 B.Tech - SECOND SEMESTER

**C PROGRAMMING LAB**

(Common to ECE, AE during I B.Tech., I Semester)

(Common to EEE, CE, ME, CSE, IT during I B.Tech., II Semester)

Course Code(s) : AE1L2, EC1L3, CE2L3, ME2L3, CS2L3, IT2L3, EE2L3

**Credits : 2****Internal Assessment : 25 marks****Lab : 3 Periods/week****Semester end examination:50marks****Objectives:**

- To make the student learn a programming language.
- To learn problem solving techniques.
- To teach the student to write programs in C and to solve the problems.

**Outcomes:**

Students will be able to

- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types.

**Syllabus:****Exercise 1:**

Basics

1. Write a program to print sample strings like "hello world", "Welcome to C Programming" with different formats using escape sequences.
2. Write a Program to print different data types in 'C' and their ranges.
3. Write a Program to initialize, assignment & printing variables of different data types.

**Exercise 2:**

Operators

1. Write a Program to demonstrate arithmetic operators. (+, -, \*, /, %)
2. Write a Program to demonstrate logical operators. (logical AND, logical OR)
3. Write a Program to read radius value from the keyboard and calculate the area of circle and print the result in both floating and exponential notation.
4. Write a Program to calculate simple interest.
5. Write a Program to convert temperature. (Fahrenheit –Centigrade and vice-versa)

**Exercise 3:**

Operators

1. Write a Program to demonstrate relational operators. (<, >, <=, >=, ==, !=)
2. Write a program to check equivalence of two numbers using conditional operator.
3. Write a Program to demonstrate pre increment and post increment. (++a, a++ where a is a value to be initialized)
4. Write a Program to demonstrate pre decrement and post decrement. (--a, a-- where a is a value to be initialized)
5. Write a program for computing the volume of sphere, cone and cylinder assume that dimensions are integer's use type casting where ever necessary.

**Exercise 4:**

Decision Statements

1. Write a Program to read marks of a student in six subjects and print whether pass or fail (using

- if-else).
- Write a Program to calculate roots of quadratic equation (using if-else).
  - Write a Program to calculate electricity bill. Read starting and ending meter reading.

The charges are as follows.

No. of Units Consumed	Rate in(Rs)
1-100	1.50 per unit
101-300	2.00 per unit for excess of 100 units
301-500	2.50 per unit for excess of 300 units
501-above	3.25 per unit for excess of 500 units

### Exercise 5:

Switch operations

- Write a Program to perform arithmetic operations using switch case.
- Write a Program to display colors using switch case (VIBGYOR).
- Write a Program to display vowels and consonants using switch case.
- Write a Program to display names of days in a Week using switch case.

### Exercise 6:

Basic Loop operations

Do the Following Programs Using for, while, do-while loops.

- Write a program to calculate sum of individual digits of a given number.
- Write a program to check whether given number is palindrome or not.
- Write a program to print prime numbers in the given range.
- Write a program to display multiplication tables from 1 to 10 except 3 and 5.

### Exercise 7:

Advanced loops

- Write a program to print the Fibonacci series for given 'N' value.
- Write a program to check whether a given number is a Fibonacci number or not.
- Write a program to read 2 numbers x and n then compute the sum of the Geometric Progression.  $1+x+x^2+x^3+-----+x^n$
- Write a program to print the following formats.

```

1          *
1 2        *  *
1 2 3      *  *  *
1 2 3 4    *  *  *  *
```

### Exercise 8:

1-D arrays

- Write a program to store 10 elements in the 1-D array and print sum of the array.
- Write a program to print minimum and maximum elements in the 1-D array.
- Write a program to count no. of positive numbers, negative numbers and zeros in the array.
- Write a program to search the given element by using linear search.
- Write a program to sort the given elements using bubble sort technique.

### Exercise 9:

2-D arrays

- Write a program to perform matrix addition and matrix subtraction.
- Write a program to perform matrix multiplication by checking the compatibility.
- Write a program to print the transpose of a matrix.

### Exercise 10:

Strings

- Write a program to perform various string manipulations using built-in functions.
- Write a program to print the given strings in ascending order.

3. Write a program to verify the given string is palindrome or not (without built-in functions, with using built-in functions).
4. Write a program to concatenate two strings using arrays.

**Exercise 11:**

## Math Functions and I/O Functions

1. Write a program to read values from keyboard and find the values using `abs()`, `sqrt()`, `floor()`, `ceil()` and `pow()`.
2. Write a program to read and display a value using `getch()` and `putch()`.
3. Write a program to read and display a value using `getchar()`, `putchar()`, `gets()` and `puts()`.

**Exercise 12:**

## Functions

1. Write a program to find sum of two numbers using functions.
2. Write a program to find product of two numbers using functions without arguments, without return type.
3. Write a program to find difference of two numbers using functions without arguments, with return type.
4. Write a program to find sum of two numbers using functions with arguments & without return type.
5. Write a program to find product of two numbers using functions with arguments, with return type.

**Exercise 13:**

## Functions and Recursion

1. Write a program to swap two numbers using Call By Value B) Call By Reference.
2. Write a program to calculate factorial, gcd using recursion and non-recursion functions.
3. Write program to perform arithmetic operations using pointer.
4. Write a program matrix addition using pointers.

**Exercise 14:**

## Structures

1. Write a program to create structure for an account holder in a bank with following Fields: name, account number, address, balance and display the details of five account holders.
2. Write a program to find total marks of individual student and average marks for 10 students using structures.
3. Write a program to create structure called traveler and members of structure are train no, coach no, seat no, source, destination, gender, age, name and departure date.
4. Write a program to illustrate passing an entire structure to a function.

**Exercise 15:**

## File operations using command line arguments

1. Write a program which copies the contents of one file to another file using command line arguments.
2. Write a program to reverse the first n characters in a file use command line arguments.

**Reference Books :**

1. Problem Solving and Program Design in C, 4<sup>th</sup> Edition, by jeri R. Hanly and Elli B.Koffman.
2. Programming in C by Pradip Dey, Manas Ghosh 2<sup>nd</sup> Edition Oxford University Press.
3. E. Balaguruswamy, Programming in ANSI C 5<sup>th</sup> Edition McGraw-Hill
4. A first book of ANSI C by Gray J.Brosin 3<sup>rd</sup> Edition Cengagedelmer Learning India P.Ltd
5. AL Kelly, Iraphol, Programming in C, 4<sup>th</sup> Edition Addison-Wesley – Professional
6. Brain W.Kernighan & Dennis Ritchie, C Programming Language, 2<sup>nd</sup> Edition, PHI

## 2/4 B.Tech - FIRST SEMESTER

**IT3T1****DIGITAL SYSTEM DESIGN****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To study the basics of various number systems, negative number representation, binary codes.
- To study representation of switching functions using Boolean algebra.
- To study the combinational logic design of various logic and switching devices and their realization.
- To study the sequential logic circuits design both in synchronous and asynchronous modes.
- To study some of the programmable logic devices and their use in realization of switching functions.

**Outcomes:**

Students will be able to

- Understand different number systems, binary addition and subtraction, 2's complement representation.
- Apply Boolean algebra Concepts for logic functions
- Implement the combinational circuits.
- Understand the concepts of Memory and Programmable Logic.
- Understand the flip-flops, sequential circuits like counters and shift registers.

**Syllabus:****UNIT- I**

Digital Systems and Binary Numbers: Digital Systems ,Binary Numbers, Number-Base conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Logic.

**UNIT-II**

Boolean Algebra and Logic Gates : Introduction, Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

Gate Level Minimization: Introduction, The Map Method, Four Variable K-map's, Product-of-Sums Simplification, Don't Care Conditions – NAND and NOR Implementation.

**UNIT- III**

Combinational Logic: Introduction, Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder-Subtractor, Magnitude Comparator, Decoders, Encoders, Multiplexers, and Demultiplexers.

**UNIT- IV**

Memory and Programmable Logic: Introduction Random-Access Memory, Read-Only Memory, Programmable Logic Array, Programmable Array Logic.

**UNIT- V**

Synchronous Sequential Logic: Introduction, Sequential Circuits, Storage Elements: Latches, Storage Elements: Flip Flops, Design Procedure.

Registers and Counters: Registers, Shift registers, Ripple Counters, Synchronous Counters.



**Text Book:**

1. Digital Design by M. Morris Mano, Michael D.Ciletti Pearson 4<sup>th</sup> Edition.

**References Books:**

1. Fundamentals of Digital circuits by A. Anand Kumar, PHI, 2<sup>nd</sup> Edition.
2. Digital Principles and Applications by Leach, Paul Malvino. Mc.GrawHill 5<sup>th</sup> Edition
3. Digital Electronics by G.K. Kharate. Oxford University Press.

**e-Learning Resources:**

1. <http://nptel.ac.in/video.php?subjectId=117105080>
2. <http://www.jntuk-coeerd.in/>

## 2/4 B.Tech - FIRST SEMESTER

IT3T2

CLASSIC DATA STRUCTURES

Credits: 3

Lecture: 3 Periods/week

Internal assessment: 30 marks

Practice/Interaction: 1Period/week

Semester end examination: 70 marks

**Objectives:**

- To assess the choice of data structures and algorithm design methods on the performance of programs.
- To focus on various linear data structures and algorithms.
- To learn the systematic way of solving problems through non linear data structures.
- To efficiently exercise different data structures for specific problems.

**Outcomes:**

Students will be able to

- Analyze algorithm efficiency in terms of time and space complexity.
- Implement different sorting and searching techniques.
- Write programs using liner data structures such as stack, queues and list.
- Write programs using nonlinear data structures such as trees, and graphs.

**Prerequisites:**

C programming language, Discrete Mathematics

**Syllabus:****UNIT- I**

INTRODUCTION: Algorithm specification Introduction, Recursive algorithms, Data Abstraction, Performance Analysis Space complexity, time complexity, asymptotic notation.

Sorting and Searching: Searching; Linear and Binary, Sorting; Bubble, Insertion, Selection, Merge, Quick, Radix

**UNIT- II**

Linked list: Single linked lists, Representing chains, operations for chains, operations for circularly linked lists, doubly linked lists, Polynomials Representation, adding polynomials, sparse matrix representation.

**UNIT -III**

STACKS AND QUEUES: Stacks, stacks using dynamic arrays, queues, circular queues using dynamic arrays, evaluation of Expressions, evaluating postfix expression, infix to postfix, linked stacks and queues.

**UNIT -IV**

Trees: Introduction Terminology, representation of trees, binary trees abstract data type, Properties of binary trees, binary tree representation, binary tree traversals In order, preorder, post order, Binary search trees Definition, searching BST, insert into BST, delete from a BST, Height of a BST.

**UNIT- V**

Graphs: The Graph ADT Introduction, definition, graph representation, elementary graph operations BFS, DFS

**Text Book:**

1. Fundamental of Data Structures in C – 2<sup>nd</sup> Edition, Horowitz, Sahani, Anderson-Freed, University Press.

**Reference Books:**

1. Data Structures – Revised First Edition, Seymour Lipschutz, Schaum's Outlines Series, Tata Mc. Graw Hill Edition.
2. Data Structures and Algorithm Analysis in C – 2<sup>nd</sup> Edition, Mark Allen Weiss, Pearson
3. Classic Data Structures – 2<sup>nd</sup> Edition, Debasis Samantha, PHI.

**e-Learning Resources:**

1. <http://cse.iitkgp.ac.in/pds/>
2. <http://cmpe.emu.edu.tr/bayram/courses/231/LectureNotesSlides/IQBAL/Lecture%20Notes%20Data%20Structures%20CSC-214.pdf>

## 2/4 B.Tech - FIRST SEMESTER

IT3T3

PROBABILITY AND STATISTICS

Credits: 3

Lecture: 3 Periods/week

Internal assessment: 30 marks

Practice/Interaction: 1Period/week

Semester end examination: 70 marks

**Objectives:**

- To introduce random Phenomena and develop skills in understand and applying basic statistical methods.

**Outcomes:**

Students will be able to

- Understand the basic principles of probability, conditional probability, Baye's rule.
- Solve problems of probability using Binomial, Poison, normal distributions.
- Understand the significance of statistical parameters like mean, variance, mode, standard deviation.
- Perform test of hypothesis in the context of single mean, two means, single proportion, several proportions.
- Understand the concept of test of significance and analysis of variance

**SYLLABUS:****UNIT- I**

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

**UNIT- II**

Probability Distributions Distribution - Binomial, Poisson and normal distribution – related properties.

**UNIT -III**

Sampling distributions Sampling distribution - Populations and samples - Sampling distributions of mean (known and unknown) Proportions, sums and differences. Estimation - Point estimation – interval estimation

**UNIT-IV**

Test of Hypothesis Statistical Hypothesis – Errors of Type I and Type II errors and calculation. One tail, two tail tests. Testing hypothesis concerning means, proportions and their differences using Z -test, t-test.

**UNIT-V**

Test of significance Test of significance – F-test,  $\chi^2$ -test,  $\chi^2$ -test for goodness of fit. Analysis of variance (ANOVA) – ANOVA for one –way, two-way.

**Text Books:**

1. Probability and statistics by Dr.T.K.V.Iyengar, Dr.B.Krishna Gandhi, S.Ranganatham  
Dr. M.V.S.S.N.Prasad, S.Chand.

**Reference books:**

1. Probability, Statistics and Queuing theory applications for Computer Sciences 2<sup>nd</sup> edition,  
Trivedi, John Wiley & sons.
2. Probability & Statistics, D. K. Murugeson & P. Guru Swamy, Anuradha Publishers. A text book  
of Probability and statistics Unitech series by Dr. Shahnaz Bathul
3. Fundamentals of Mathematical Statistics – S.C. Gupta & V.K.Kapoor S.Chand

**e-Learning Resources:**

1. [www.nptel.ac.in](http://www.nptel.ac.in)
2. [www.jntuk coeerd.in](http://www.jntuk coeerd.in)

## 2/4 B.Tech - FIRST SEMESTER

**IT3T4****OOPS THROUGH C++****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide knowledge on different programming paradigms.
- To get familiar with principles of object oriented programming.
- To Demonstrate and Develop programs in C++.
- To provide overview of predefined libraries in C++.

**Outcomes:**

Students will be able to

- Understand general principles and basics of C++.
- Understand the features of Object Oriented Programming.
- Understand the use of Pointers, Runtime Polymorphism.
- Identify the use of Files and Generic programming in C++.
- Understand the use of Libraries and Implement the Exception Handling concepts.

**Pre-requisite:**

C Programming.

**Syllabus:****UNIT-I**

Introduction to C++, Input and output in C++, declarations, Decision statements, control loop structures, function in C++.

**UNIT-II**

Classes and objects, constructors and destructors, operator overloading, Inheritance.

**UNIT- III**

Arrays, Pointers, Memory Models, Binding and Polymorphism.

**UNIT-IV**

Files, Templates: Introduction, need for templates, definition of class templates, working of function templates, class templates with more parameters, function templates with more arguments, overloading of template function, member function templates, recursion with function templates.

**UNIT-V**

Strings, Exception Handling, STL.

**Text Book:**

Programming in C++, 2/e, by Ashok N Kamthane, Pearson Education.

**Reference Books:**

1. C++ How To Program, Dietel and Dietel, Prentice Hal .
2. C++ The Complete Reference, 5<sup>th</sup> Edition, by Herbert Schildt, TMH.

**E-Learning Resources:**

1. <http://www.nptelvideos.com/video.php?id=2177&c=28>

## 2/4 B.Tech - FIRST SEMESTER

**IT3T5****OPERATING SYSTEMS CONCEPTS****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To give an overview on Operating Systems.
- To demonstrate process management and system structure.
- To discuss about the process scheduling and synchronization.
- To explain in detail about memory management and virtual memory.
- To discuss about various concepts in File system.

**Outcomes:**

Students will be able to:

- Understand different structures and services of the operating system.
- Understand the use of scheduling and operations on process.
- Understand the process scheduling algorithms and synchronization concepts.
- Understand the concepts of deadlock and memory management techniques.
- Understand the concepts of virtual memory management techniques and File System.

**Prerequisites:**

C Programming

**Syllabus:****UNIT-I**

Computer System and Operating System Overview: Introduction, Computer System Organization & Architecture, Operating System services, O.S structure, Evaluation of O.S, Special purpose Systems.

**UNIT-II**

System Structure: System Calls

Process Management: Process Concept, Process scheduling, Operations on processes, Interprocess Communication, overview of threads, multi threaded models.

**UNIT-III**

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms

Process Synchronization: Critical Section Problem, Semaphores, Monitors.

**UNIT-IV**

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection & Recovery.

Memory Management: Logical vs. physical address space, Swapping, Contiguous Memory Allocation, Paging, Segmentation.

**UNIT-V**

Virtual Memory Management: Introduction, Demand Paging, Page Replacement & its Algorithms (FIFO, LRU Optimal), Thrashing.

Storage Management

File System: File Concept, Access Methods, Directory & Disk Structure, Allocation methods.

**Text Book:**

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8<sup>th</sup> Edition, John Wiley.

**Reference Books:**

1. Operating Systems – Internal and Design Principles Stallings, 6<sup>th</sup> Edition–2005, Pearson education.
2. Tanenbaum A.S., “Operating System Design & Implementation”, Practice Hall NJ.
3. Silbersehatz A. and Peterson J. L., “Operating System Concepts”, Wiley.
4. Dhamdhere: Operating System TMH
5. Stalling, William, “Operating Systems”, Maxwell McMillan International Editions.
6. Dietel H. N., “An Introduction to Operating Systems”, Addison Wesley.

**e-Learning Resources:**

1. <http://nptel.ac.in/downloads/106108101/>
2. [http://www.youtube.com/watch?v=MaA0vFKt-ew&list=PL88oxl15Wi4Kw1aEY2bC5l\\_4pouojtd4](http://www.youtube.com/watch?v=MaA0vFKt-ew&list=PL88oxl15Wi4Kw1aEY2bC5l_4pouojtd4)
3. <http://www.jntuk-coeerd.in/>
4. [http://iit.qau.edu.pk/books/OS\\_8th\\_Edition.pdf](http://iit.qau.edu.pk/books/OS_8th_Edition.pdf)



## 2/4 B.Tech - FIRST SEMESTER

IT3L1

CLASSIC DATA STRUCTURES LAB

Credits: 2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To implement recursive and non recursive functions.
- To implement stack, queue, linked list, tree and graph data structures.
- To arrange data using different sorting techniques.

**Outcomes:**

Students will be able to

- Learn elementary data structures such as stacks, queues, linked lists.
- Write programs to implement non linear data structures like trees and graphs.
- Identify the appropriate data structure for given problem
- Get practical knowledge on the application of data structures

**Exercise 1**

Write the programs for the following searching techniques:

Linear and Binary.

**Exercise 2**

Write the programs for the following sorting techniques:

Bubble, Insertion, Quick, and Merge

**Exercise 3**

- a) Implementation of stack operations using arrays.
- b) Implementation of queue operations using arrays.

**Exercise 4**

a) Railroad cars numbered are as 0,1,2,---,n-1. Each car is brought into the stack and removed at any time. For instance, if n=3, we could move 0, move 1, move 2 and then take the cars out, producing 2,1,0. Implement application for the given problem.

b) Consider a payment counter at which the customer pays for the items purchased. Every time a customer finished paying for their items, he/she leaves the queue from the front. Every time another customer enters the line to wait, they join the end of the line. Implement the application for this problem.

**Exercise 5**

Implementation of singly linked list

**Exercise 6**

Implementation of doubly linked list

**Exercise 7**

- a) Implement Exercise 4(a) using linked lists.
- b) Implement Exercise 4(b) using linked lists.

**Exercise 8**

a) A polynomial has the main fields as coefficient, exponent in linked list it will have one more field called link to point to next term in the polynomial. If there are n terms in the polynomial then n such nodes has to be created.

**Exercise 9**

Implementation of Binary Search Tree operations

**Exercise 10**

Implementation of Graph traversals

- I) BFS
- II) DFS

**Reference Books:**

1. Seymour Lipschutz, Data Structures, Schaum's Outlines Series, Tata McGraw-Hill.
2. Ellis Horowitz, Satraj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, W. H. Freeman and Company

## 2/4 B.Tech - FIRST SEMESTER

IT3L2

OOPS THROUGH C++ LAB

Credits: 2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To practice object-oriented concepts through C++.
- To provide practical knowledge on C++
- To demonstrate the use of inheritance, virtual functions, polymorphism and templates.
- To practice on exception handling and streams.

**Outcomes:**

Students will be able to

- Distinguish Object Oriented programming with declarative and procedural programming.
- Implement the concepts of inheritance, virtual functions and polymorphism.
- Implement the concepts of exception handling.
- Develop applications using template programming.
- Develop programs with streams.

**Exercise 1**

- a) Write a C++ program to print your personal details name, surname(single character), total marks, gender(M/F), result(P/F) by taking input from the user.
- b) Write a C++ program to convert centigrade into Fahrenheit. Formula: $C=(F-32)/1.8$ .
- c) Write a C++ program that declares two integers, determines whether the first is a multiple of the second and print the result. (Hint: Use the remainder operator).

**Exercise 2**

- a) Write a C++ program to convert decimal to binary.
- b) Write a C++ program to print the accepted number and its reverse number.
- c) Develop a simple calculator using if-else if and switch-case.
- d) Write a C++ program to find the sum of individual digits of a positive integer.

**Exercise 3**

- a) Create a class called 'Employee' that has 'Empnumber' and 'Empname' as data members and member functions getdata( ) to input data display() to output data. Write a main function to create an array of 'Employee' objects. Accept and print and accept the details of at least 6 employees.
- b) Write a C++ program to create a simple banking system in which the initial balance and the rate of interest are read from the keyboard and these values are initialized using the constructor. The destructor member function is defined in this program to destroy the class object created using constructor member function. This program consists of following member functions:
  - i. Constructor to initialize the balance and rate of interest
  - ii. Deposit - To make deposit
  - iii. Withdraw – To with draw an amount
  - iv. Compound – To find compound interest
  - v. getBalance – To know the balance amount
  - vi. Menu – To display menu options
  - vii. Destructor

**Exercise 4**

- a) Write a C++ program to add two complex numbers by passing objects as parameters.
- b) Write a C++ program to illustrate the usage of static data members.

**Exercise 5**

- a) Write a C++ program to add two complex numbers using binary operator overloading.
- b) Write a C++ program to add two complex numbers using unary operator overloading.
- c) Write a C++ program to print a complex number using assignment operator overloading

**Exercise 6**

Write a C++ Program to implement

- i. Multilevel inheritance
- ii. Multiple inheritances
- iii. Hierarchical Inheritance
- iv. Hybrid inheritance through virtual base class

**Exercise 7**

- a) Write a C++ program to display elements of an array using pointer. Display addresses of elements.
- b) Write a C++ program to pass elements of an array to a function by using call by value.
- c) Write a C++ program to pass elements of an array to a function by using call by reference.
- d) Write a C++ program to initialize an array using functions.
- e) Write a C++ program to display array elements and their addresses using pointers.

**Exercise 8**

Write a C++ programs to implement

- a) Run-time polymorphism
- b) Abstract class

**Exercise 9**

- a) Write a C++ program to display the contents of text file
- b) Write a C++ program by accepting two file names and produces a new file that contains that contains the contents of accepted files
- c) Write a C++ program that produces the sum of all the numbers in a file of white space separated integers.

**Exercise 10**

Write a C++ program to illustrate

- a) Class templates
- b) Class templates with multiple parameters
- c) Function templates

**Exercise 11**

- a) Write a C++ program to declare string objects. Perform assignment and concatenation operations with the string objects.
- b) Write a C++ program to compare two strings using standard function compare().
- c) Write a C++ program to remove specified characters from the string.
- d) Write a program to display the capacity of the string object. Use member function capacity().

**Exercise 12**

- a. Write a C++ program to illustrate
  - i. Division by zero
  - ii. Array index out of bounds exception
- b. Write a C++ Program to illustrate the concept of multiple catch block
- c. Write a C++ Program to illustrate rethrowing an exception.

**Reference Books:**

1. Programming in C++, 2<sup>nd</sup> Edition Ashok N Kamthane, Pearson Education
2. C++ How to program, Dietel and Dietel, Prentice hal
3. C++ Complete Reference, 5<sup>th</sup> Edition, by Herbert schildt TMH

## 2/4 B.Tech - FIRST SEMESTER

IT3L3

DIGITAL SYSTEM DESIGN LAB

Credits: 2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To verify basic logic gates.
- To verify half-adder and full-adder and its truth tables.
- To implement and verify Encoder\Decoder and Multiplexer\De-Multiplexer using logic gates.
- To verify state tables of RS, JK, T and D flip-flops using NAND & NOR gates.
- To verify Basic Shift Registers.

**Outcomes:**

Students will be able to

- Get practical knowledge on number systems.
- Get familiar with half-adder and full-adder logic circuits.
- Get familiar with Decoder, Encoder, Multiplexer and De-multiplexer circuits.
- Get familiar with Flip-Flops and its circuitry.
- Get familiar with basic shift registers and its circuitry.

**Exercise 1**

Boolean algebra: Theorems and logical guides, verification of truth tables

**Exercise 2**

Realization of Boolean expressions; Using (i) AND – OR-NOT Gates (ii) NAND Gates (iii) NOR Gates

**Exercise 3**

Code Converters: Binary – to- Gray, Gray- to -Binary

**Exercise 4**

Simplification of Boolean Functions

**Exercise 5**

Adders / Sub tractors: Half Adder, Full Adder,

**Exercise 6**

Multiplexers/ Data Selector: 2- input and 8- input, De-multiplexers, Logic Function Generator

**Exercise 7**

Decoders and Encoders.

**Exercise 8**

Comparators

**Exercise 9**

Latches Flip – Flops: RS, JK, T, D Flip – Flops.

**Exercise 10**

Counters: Binary Counter, Ripple Counter, Up/Down Counter

**Exercise 11**

Registers: Basic Shift Register (SR), SI/SO SR, SI/PO SR, PI/SO SR, PI/PO SR.

**Exercise 12**

Parity Generators/Checkers.

**Reference Book:**1. Digital Design by M. Morris Mano, Michael D.Ciletti Pearson 4<sup>th</sup> Edition.

## 2/4 B. Tech - FIRST SEMESTER

IT3L4

TECHNICAL ENGLISH

Credits: 1

Lab: 2 Periods/week

Internal assessment: 50 marks

**Objectives:**

- To improve creativity in the students.
- To enable extemporaneous speaking, clarity of speech etc.
- To enhance the argumentative capacities.
- To create a broad exposure to diverse thinking.
- To develop Interpersonal and group skills.

**Outcomes:**

Students will be able to

- Apply Expressionistic ability.
- Develop Assertiveness.
- Acquire Leadership qualities.
- Develop Communicative competence.
- Refine Interview Skills.

**Syllabus:****UNIT- I**

- a. Just a minute on emerging technologies.
- b. Public speaking

**UNIT- II**

- a. Debates on topics related to technology.
- b. Group discussion.
- c. Model group discussion.
- d. Dynamics

**UNIT -III**

- a. Presentations skills.
- b. Power point presentations.

**UNIT -IV**

- a. Reporting
- b. Meeting skills

**UNIT- V**

- a. Interview skills.
- b. Resume preparation.
- c. Mock interviews.

**Reference books:**

1. Technical Communication-Ashraf Rizwi, McGraw Hill Publication
2. Business Communication and Personality Development-lesson for paradigm change in personality –Biswajit Das & Ipseeta Satpathy.

## 2/4 B.Tech - SECOND SEMESTER

**IT4T1****ADVANCED DATA STRUCTURES****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To choose the appropriate data structure algorithm for a specified application.
- To learn the systematic way of solving problems on Dictionaries, Skip lists, Hashing, Balanced Trees, Priority Queues, graphs, and Pattern matching, Tries and File Structures and writing programs for these solutions.
- To efficiently implement the different data structures and solutions for specific problems.

**Outcomes:**

Students will be able to

- Understand the usage of various data structures and Implement programs using Dictionaries and Skip Lists.
- Implement different operations on trees, heaps and Priority Queues.
- Apply Knowledge on Different graph algorithms.
- Implement different Pattern Matching algorithms & Tries.
- Understand the basic concepts of file structures.

**Prerequisites:**

C Programming, Classic Data Structures.

**Syllabus:****Unit -I**

Dictionaries: Sets, Dictionaries, Hash Tables, Open Hashing, Closed Hashing (Rehashing Methods), Hashing Functions (Division Method, Multiplication Method, Universal Hashing), Analysis of Closed Hashing Result (Unsuccessful Search, Insertion, Successful Search, Deletion), Hash Table Restructuring, Skip Lists, Analysis of Skip Lists.

**Unit -II**

Balanced Trees: AVL Trees: Maximum Height of an AVL Tree, Insertions and Deletions. Red-Black Trees: Introduction, operations on Red-Black Trees. 2-3 Trees: Insertion, Deletion. Priority Queues: Binary Heaps: Implementation of Insert and Delete min, Creating Heap.

**Unit -III**

Graphs: Operations on Graphs: Vertex insertion, vertex deletion, find vertex, edge addition, edge deletion, Graph Traversals- Depth First Search and Breadth First Search(Non recursive), Graph storage Representation- Adjacency matrix, adjacency lists.

Graph algorithms: Minimum-Cost Spanning Trees-Prim's Algorithm, Kruskal's Algorithm, Shortest Path Algorithms: Dijkstra's Algorithm, All Pairs Shortest Paths Problem: Warshall's Algorithm.

**Unit -IV**

Pattern matching and Tries: Pattern matching algorithms- the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm, Robin – Karp algorithm.

Tries: Definitions and concepts of digital search tree, Binary trie, Patricia , Multi-way trie.

### **Unit- V**

File Structures: Fundamental File Processing Operations-opening files, closing files, Reading and Writing file contents, Special characters in files.

Fundamental File Structure Concepts- Field and record organization, Managing fixed-length, fixed-field buffers.

#### **Text Books:**

1. Fundamentals of DATA STRUCTURES in C: 2<sup>nd</sup> Edition, , Horowitz , Sahani, Anderson-freed, Universities Press
2. Data structures and Algorithm Analysis in C, 2<sup>nd</sup> Edition, Mark Allen Weiss, Pearson

#### **Reference Books:**

1. File Structures :An Object oriented approach with C++, 3<sup>rd</sup> Edition, Michel J Folk, Greg Riccardi, Bill Zoellick
2. C and Data Structures: A Snap Shot oriented Treatise with Live examples from Science and Engineering, NB Venkateswarlu& EV Prasad, S Chand, 2010.
3. Data Structures and Algorithms, A. A. Puntambekar, Tech Publications.

#### **e- Learning Resources:**

1. <http://www.nptel.ac.in/video.php?subjectId=106105085>.
2. <http://lcm.csa.iisc.ernet.in/dsa/dsa.html>.
3. <http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures>.
4. <http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms>.



## 2/4 B.Tech - SECOND SEMESTER

**IT4T2****DATABASE SYSTEMS****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide knowledge on fundamental concepts of DBMS, architecture and components.
- To apply SQL to create, update and query database.
- To give an introduction to systematic database design approaches covering conceptual design (ER Modeling), relational database design and normalization.
- To provide knowledge on the role of transaction processing and concurrency control in a modern DBMS which includes query processing, scheduling, security, concurrency and integrity.

**Outcomes:**

Students will be able to

- Understand the database approaches, data models, types of languages and Interfaces that DBMSs support.
- Understand the formal relational languages and able to write relational algebra expressions.
- Apply SQL commands to create, update and fetch data from database.
- Understand and analyze the different issues involved in the design and schema refinement.
- Understand the transaction management system, concurrency techniques and database recovery techniques.

**Syllabus:****UNIT -I**

Introduction: Database System Application, Purpose of Database Systems, View of Data, Database Languages, Data Storage and Querying, Transaction Management, Database Architecture, Specialty Databases, Database Users and Administrators.

Introduction to the Relational Model: Structure of Relational Database, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.

**UNIT-II**

Formal Relational Query Languages: The Relational Algebra, The Tuple Relational Calculus, The Domain Relational Calculus.

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Data Types, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Aggregate Functions, Modification of the Database.

**UNIT-III**

Advanced SQL: Dynamic SQL, embedded SQL, Integrity constraints, Nested Sub queries, joins views, Functions and Procedures, Triggers in SQL.

Database Design and ER Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams, E -R Design Issues, Extended E-R Features, Alternative Notations for Modeling Data.

**UNIT-IV**

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies , Functional-Dependency Theory , Decomposition Using Multi valued Dependencies , Database-Design Process.

**UNIT-V**

Transactions: Transaction concept, A Simple transaction model, Storage structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transactions as SQL statements. Concurrency Control, Recovery Systems: Introduction to Lock-Based Protocols, Failure classification, Introduction to Recovery and Atomicity

**Text Book:**

1. Abraham Silbersehatz, Henry F Korth, Sudharshan, "Database Systems Concepts", 6<sup>th</sup> Edition, McGraw-hill international edition, 2010.

**Reference Books:**

1. Date CI, Kannan A, Swamynathan S, "An introduction to Database Systems", 8<sup>th</sup> Edition, Pearson education, 2006.
2. Raghu Rama Krishnan, Johannes Gehrke, "Database Management Systems", 3<sup>rd</sup> Edition, McGraw-hill international edition , 2003.
3. RamezElmasri, Durvasul VLN Somayazulu, Shamkant B Navathe, Shyam K Gupta, "Fundamental of Database Systems", 4<sup>th</sup> Edition, Pearson education , 2006.
4. Peter Rob, Carlos Coromci, "Database Systems", Thomson, 2007.

**e- Learning Resources:**

1. <http://nptel.ac.in/video.php?subjectId=106106093>.
2. <http://freevideolectures.com/Course/2668/Database-Management-System#>
3. <http://csvls.blogspot.in/2010/04/database-management-system-video.html>
4. <http://cosmolearning.org/courses/database-design-417/video-lectures/>

## 2/4 B.Tech - SECOND SEMESTER

**IT4T3****JAVA****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce basic concepts of java programming.
- To discuss the concepts of objects, classes, interfaces exceptions and Multi threading.
- To demonstrate OOPS concepts through problem analysis.
- To discuss the concepts of java API through Programming

**Outcomes:**

Students will be able to

- Identify classes, objects, members of a class and the relationships among them.
- Design programs using the concepts of inheritance, packages and interfaces.
- Understand the concept of exception handling, thread synchronization and java applets.
- Understand the event-based GUI handling principles using AWT concepts.
- Analyze the concept of client/server programming using GUI Interface.

**Prerequisites:**

- C Programming
- OOPS through C++.

**Syllabus:****UNIT -I**

GENESIS OF JAVA: History of Java, Importance of java to Internet, Byte code, Java Features, Data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program.

CLASSES AND OBJECTS: classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, Exploring the String class, String Buffer Class, String Tokenizer, Exploring NIO

**UNIT -II**

INHERITANCE: Inheritance basics, Using super keyword, method overriding, Dynamic method dispatch using final with inheritance, abstract classes.

PACKAGES AND INTERFACES: Defining, Creating and Accessing a Package, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

**UNIT -III**

EXCEPTION HANDLING AND MULTITHREADING: Exception handling Fundamentals, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exceptions. Differences between multi threading and multitasking, thread life cycle, creating threads, Concurrency utilities.

APPLETS: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets.

**UNIT -IV**

EVENT HANDLING: Delegation event model, Events, Event sources, Event classes, Event Listeners, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy: labels, button, scrollbars, text components, check box, check box groups, choices, list boxes. Layout manager types: border, grid, flow, card and grid bag.

**UNIT-V**

SWINGS: Introduction, limitations of AWT, components, containers EXPLORING SWINGS- JApplet, JFrame and JComponent, text components, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes. JTabbedPane.

NETWORKING: Basics of network programming, simple client server program, java.net package

**Text Book:**

1. Java: The complete reference, 8<sup>th</sup> edition, Herbert Schildt, TMH.

**Reference Books:**

1. Programming in Java2 –Dr.K.Somasundaram.
2. Programming with Java, A Primer-E.Balaguruswamy.
3. Java Programming Fundamentals – JimKeoghDreamTech Publications.
4. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, 7<sup>th</sup> Edition, Pearson Education.

**e-Learning Resources:**

1. <http://www.nptelvideos.com/java/>
2. <http://ocw.mit.edu/courses/>

## 2/4 B.Tech - SECOND SEMESTER

**IT4T4****AUTOMATA AND COMPILER DESIGN****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To get familiar with regular expressions to describe a language using automata.
- Usage of context free grammars to describe the syntax of a language.
- To learn different parsing techniques.
- To provide techniques for syntactic, semantic language analysis, intermediate code Generation and optimization.

**Outcomes:**

Students will be able to

- Read and write finite automata and grammars for programming language constructs.
- Understand the functionality of parsing mechanisms.
- Construct syntax trees and generate intermediate code.
- Understand the concepts of storage administration for different programming environments.
- Understand the concepts of optimization and generate the machine code.

**SYLLABUS****UNIT - I**

Formal Language And Regular Expressions : Languages, Operations On Languages, Regular Expressions, Identity Rules For Regular Expressions, Finite Automata – DFA, NFA, Conversion Of Regular Expression to NFA, NFA To DFA. Introduction to Compilers: Phases of the Compiler.

**UNIT- II**

Syntax Analysis: Context Free Grammars, Top-Down Parsing, Recursive Descent Parsers: LL (K) Parsers. Bottom-Up Parsing: Shift Reduces Parser, LR Parsers: SLR, CLR, LALR.

**UNIT- III**

Syntax Directed Translation: Syntax Directed Definition, Construction of Syntax Trees, L-Attributed Definitions. Intermediate Code Generation: Intermediate Languages, Translation of Assignment Statements and Boolean Expressions.

**UNIT- IV**

Type Checking: Specification of Simple Type Checker, Equivalence of Type Expressions, Type Conversions Runtime Environments: Storage Organization, Storage Allocation Strategies, Access to Non Local Names, Parameter Passing, Symbol Table, Dynamics Storage Allocation Techniques.

**UNIT- V**

Code Optimization: Principal Sources Of Optimization, Optimization Of Basic Blocks, Loops In Flow Graphs, Global Data Flow Analysis, Peephole Optimization.

Code Generation: Issues in Design of Code Generator, Simple Code Generator, Register Allocation and Assignment, DAG Representation of Basic Block, Generating Code from DAGs.

**Text Books:**

1. Compilers Principles, Techniques and Tools, Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, PEA.
2. Introduction to Automata Theory Languages & Computation, 3<sup>rd</sup> Edition, Hopcroft, Ullman, PEA

**Reference Books:**

1. Theory of Computer Science, Automata Languages and Computation, 2<sup>nd</sup> Edition, Mishra, Chandra Shekaran, PHI.
2. Elements of Compiler Design, A.Meduna, Auerbach Publications, Taylor and Francis Group.

**e-Learning Resources:**

1. [http://www.Practice/Interactionspoint.com/compiler\\_design/compiler\\_design\\_finite\\_automata.htm](http://www.Practice/Interactionspoint.com/compiler_design/compiler_design_finite_automata.htm)
2. [nptel.ac.in/courses/106108113/](http://nptel.ac.in/courses/106108113/)
3. [nptel.ac.in/courses/106108113/11](http://nptel.ac.in/courses/106108113/11)

## 2/4 B.Tech - SECOND SEMESTER

**IT4T5****COMPUTER SYSTEM ARCHITECTURE****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To get knowledge on the central processing unit and various instructions formats together with a variety of addressing modes.
- To discuss in detail about the operation of the arithmetic unit including the algorithms & Implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the hierarchical memory system including cache memories and virtual memory
- To study the different ways of communicating with I/O devices, concept of pipelining and the way it can speed up the processing, Instruction pipelining and RISC pipelining.

**Outcomes:**

Students will be able to

- Understand the implementation of micro operations.
- Understand the organization of basic computer and its design.
- Understand central processing unit and various instructions formats together with a variety of addressing modes.
- Understand the organization of the Control unit, Arithmetic and Logical unit, Memory unit.
- Analyze the concepts of I/O communication, pipeline and vector processing.

**Prerequisites:**

Digital System Design.

**Syllabus:****UNIT-I**

REGISTER TRANSFER AND MICRO-OPERATIONS: Register Transfer Language, Register Transfer, Bus and memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

**UNIT-II**

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-Output and Interrupt

**UNIT-III**

MICRO PROGRAMMED CONTROL: Control Memory, Address Sequencing, Micro-Program example. CENTRAL PROCESSING UNIT: General register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control

**UNIT-IV**

COMPUTER ARITHMETIC: Addition and Subtraction, Multiplication Algorithms, Division Algorithms ,Floating-point Arithmetic operations.

MEMORY ORGANIZATION: Memory Hierarchy, Main Memory, Auxiliary memory, Associative Memory, Cache Memory, Virtual Memory.

#### **UNIT-V**

INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor.

PIPELINE AND VECTOR PROCESSING: Parallel processing, Pipelining, Arithmetic pipeline, Instruction pipeline, Risc pipeline. Organization of Intel 8085 Micro-Processor.

#### **Text Book:**

1. Computer System Architecture, Morris M. Mano, 3<sup>rd</sup> Edition, Prentice Hall India.

#### **Reference Books:**

1. Computer Organization and Architecture, William Stallings, 8<sup>th</sup> Edition, PHI
2. Computer Organization, Carl Hamachar, Vranesic, McGraw Hill.

#### **e-Learning Resources:**

1. <http://jntuk-coeerd.in/>
2. <http://nptel.ac.in/courses.php>
3. <http://freevideolectures.com/Course/2277/Computer-Organization#>



## 2/4 B.Tech - SECOND SEMESTER

IT4L1

DATABASE SYSTEMS LAB

Credits:2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To provide hands on experience on Relational Database Management System ORACLE.
- To provide knowledge on creating databases and retrieving data using SQL queries.
- Develop PL/SQL programs using stored procedures, functions, packages, cursors and triggers.

**Outcomes:**

Students will be able to

- Construct database schema using DDL commands and to enforce constraints on schema.
- Query and update data from tables.
- Write complex queries to select a subset of the data from the collection of tables.
- Write programming blocks with conditionals, assignments, loops and pl/sql constructs such as exception handling, stored procedures, functions, packages, cursors and triggers in PL/SQL.

**Exercises:**

- 1) Create, alter and drop tables (DDL statements) and insert data into a table (use constraints while creating tables).
- 2) Queries using aggregate functions (COUNT, SUM, AVG, MAX and MIN), ORDER BY and GROUP BY- HAVING clauses.
- 3) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS and set operators.
- 4) Queries using JOINS (INNER JOIN, NATURAL JOIN, CROSS JOIN, and LEFT AND RIGHT OUTER JOINS).
- 5) A) Queries using Conversion functions, string functions and date functions.  
B) Creation and dropping of views.
- 6) A) Write simple PL/SQL programs using LOOPS and conditional statements.  
B) Write simple PL/SQL programs using different Exceptions.
- 7) Write programs using features parameters in a CURSOR.
- 8) Write a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
- 9) Write PL/SQL programs using procedures.
- 10) Write PL/SQL programs using procedures using functions.
- 11) Develop Programs using triggers.
- 12) Write a program using packages.

**Reference Books:**

1. Learning Oracle SQL and PL/SQL - A Simplified Guide ,Rajeeb C. Chatterjee
2. Simplified Guide to SQL and PL/SQL by Shah Nilesh.
3. Oracle PL/SQL by Example Benjamin Rosenzweig, Elena Silvestrova, Third edition, Pearson Education.
4. SQL&PL/SQLforOracle10g,BlackBook,Dr.P.S.Deshpande.

## 2/4 B.Tech - SECOND SEMESTER

IT4L2

JAVA LAB

Credits:2

Lab: 3 Periods/week

Internal assessment: 25 marks

Semester end examination: 50 marks

**Objectives:**

- To develop programs using object oriented concepts.
- To develop GUI applications and Client/Server communication using Java.

**Outcomes:**

Students will be able to

- Use basic I/O to communicate with the user to populate variables and control program flow.
- Implement classes, constructors and method overloading.
- Implement appropriate program design using good programming style.
- Write programs to solve more complicated problems using the concepts of Object Oriented and java technology.

**Exercise 1**

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.

**Exercise 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 and find its transpose (Exercise Find identity Matrix of a given size)

**Exercise3**

- a) Write a Java program that checks whether a given string is a palindrome or not. Ex MALAYALAM is a palindrome.
- b) Write a Java program for sorting a given list of names in ascending order.
- 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)

**Exercise 4**

- d) Write a Java program that reads a file name from the user, and 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.
- e) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- f) Write a Java program that displays the number of characters, lines and words in a text file.

**Exercise 5**

Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviors, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.

**Exercise 6**

(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) Write a Java program that demonstrates Packages

**Exercise 7**

a) Write a Java program demonstrating the life cycle of a thread.

b) Develop an applet that displays a simple message.

**Exercise 8**

a) 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.

b) Write a Java program that allows user to draw lines, rectangles and ovals.

**Exercise 9**

a) 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.

b) Write a Java program for handling mouse events.

**Exercise 10**

a) 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.

b) Write a Java program that lets users create Pie charts. Design your own user interface (with Swings & AWT).

**Reference Books:**

1. Java How to Program, 6<sup>th</sup> Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education
3. Big Java, 2<sup>nd</sup> edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.

## 2/4 B.Tech - SECOND SEMESTER

IT4L3

ADVANCED DATA STRUCTURES LAB

Credits: 2

Lab: 3 Periods/week

Internal assessment: 25 marks

Semester end examination: 50 marks

**Objectives:**

- To implement Linear and Non linear data structures.
- To arrange and manipulate data using different graph techniques.
- To use different hashing & String matching techniques.

**Outcomes:**

Students will be able to

- Understand and Implement functions of dictionary using hashing.
- Implement data structures programs on trees and graphs.
- Develop Pattern matching algorithms.
- Apply Knowledge on files.

**Prerequisites:**

C programming, Classic Data Structures.

**Exercise 1.**

To implement functions of Dictionary using Hashing (division method, Multiplication method, Universal hashing)

**Exercise 2.**

To perform various operations like insertions and deletions on AVL trees

**Exercise 3.**

To perform various operations like insertions and deletions on Red-Black trees

**Exercise 4.**

To perform various operations i.e., insertions and deletions on 2-3 trees.

**Exercise 5.**

To implement operations on Binary Heap.

**Exercise 6.**

To implement Prim's algorithm to generate a min-cost spanning tree.

**Exercise 7.**

To implement Krushkal's algorithm to generate a min-cost spanning tree.

**Exercise 8.**

To implement Dijkstra's algorithm to find shortest path in the graph.

**Exercise 9.**

To implement Warshall's algorithm to find shortest path for the given graph.

**Exercise 10.**

To implement pattern matching using Boyer-Moore algorithm.

**Exercise 11.**

To implement Knuth-Morris-Pratt algorithm for pattern matching.

**Exercise 12.**

To implement a file program, Copy the contents of a file to another file, count and print how many bytes were copied.

**Reference Books:**

1. File Structures : An Object oriented approach with C++, 3<sup>rd</sup> Edition, Michel J Folk, Greg Riccardi, Bill Zoellick
2. C and Data Structures: A Snap Shot oriented Treatise with Live examples from Science and Engineering, NB Venkateswarlu & EV Prasad, S Chand, 2010.
3. Data Structures A Pseudo code approach with C, Richard F. Gilberg and BehrouzA. Forouzan, Thomson, 2005.
4. Data Structures & Program Design in C, Robert Kruse & Bruce Leung, Pearson Education, 2007.

## 2/4 B.Tech - SECOND SEMESTER

IT4L4

SOFT SKILLS COURSE

Credits:2

Lab: 2 Periods/week

Internal assessment: 50 marks

**Objectives:**

- To introduce them to various aspects of soft skills and personality development.
- To provide adequate exposure to the process of recruitment.
- To enhance their communicative competence.
- To make them ready to face the campus recruitment drives.

**Outcomes:**

Students will be able to

- Improve communication skills.
- Build personality.
- Acquire leadership qualities.
- Improve self confidence.

**Syllabus:****1. Soft skills for career.**

- a. Conflict resolution
- b. Assertive nature

**2. Soft skills demanded by employer.**

- a. Team work
- b. Self confidence
- c. Responsibility
- d. Time management
- e. Attitude
- f. Empathy

**3. Communication and Networking.**

- a. Verbal communication
- b. Non verbal communication

**4. Resume preparation.****5. Group discussion.****6. Interview skills.****Reference Book:**

1. Personality Development and Soft Skills-Baren.K.Mithra Oxford

## 3/4 B.Tech - FIRST SEMESTER

**IT5T1****UNIX****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To Use the UNIX environment efficiently and to analyze the basic Unix Shell utilities.
- To acquire knowledge on UNIX file system along with File and directory operations.
- To get familiar with UNIX Process management and signal management.

**Outcomes:**

Students will be able to

- Understand the structure of UNIX environment and its accessing using basic commands.
- Learn Shell programming and employ Shell Scripts.
- Understand the File structure, Directories and their associated system calls with examples.
- Gain knowledge on Unix Process.
- Understand the concept of signals and Inter process communication.

**Prerequisites**

C Programming.

**Syllabus:****Unit-I**

Introduction To Unix File System, Vi Editor, Basic Utilities, File Handling Utilities, Security And File Permissions, Process Utilities, Disk Utilities, Text Processing Utilities and Backup Utilities (Detailed Commands to be Covered are who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, unlink, chmod, ps, du, df, mount, umount, find, umask, unmask, ulimit, , w, finger, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, tar, gzip, cpio)

**Unit- II**

Working With The Bourne Shell: What Is Shell, Shell Responsibilities, Pipes and Input Redirection, Output Redirection, here Documents, The Shell as A Programming Language, Shell Meta Characters, Shell Variables, Shell Environment, Control Structures, Shell Script Examples.

**Unit-III**

Unix File structure, Directories, Files and Devices, System calls, Library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, octl, dup, dup2, system calls. File Handling System Calls using Standard I/O (fopen, fclose, fflush, fseek, fgetc, getchar, fputc, putc, putchar, fgets, gets), Directory handling system calls (opendir, readdir, closedir, rewinddir, seekdir, telldir)

**Unit-IV**

Unix process: What is process, process structure, starting new process, waiting for a process, zombie process, process control, process identifiers, System call interface for process management, (fork, exit, wait, waitpid, exec, system)

**Unit-V**

Signals: Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions. Introduction to Inter process communication: pipes, FIFOs

**Text Books:**

1. Unix and shell Programming- Behrouz A. Forouzan, Richard F. Gilberg.Thomson
2. Advanced Programming in Unix Environment- Richards Stevens

**Reference Books:**

1. Unix and Shell Programming - Yaswant Kanetkar
2. Advanced Unix Programming -NB Venkateswarlu,BS Publications, 2<sup>nd</sup> Edition

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/106108101/>
2. <http://sites.harvard.edu/~lib215/lectures/>
3. <http://elearning.vtu.ac.in/CS36.html>
4. <http://www.doc.ic.ac.uk/~wjk/UnixIntro/>
5. <http://ptgmedia.pearsoncmg.com/images/9780321637734/samplepages/0321637739.pdf>



## 3/4 B.Tech - FIRST SEMESTER

<b>IT5T2</b>	<b>DESIGN METHODS AND ANALYSIS OF ALGORITHMS</b>	<b>Credits: 3</b>
<b>Lecture: 3 Periods/week</b>		<b>Internal assessment: 30 marks</b>
<b>Practice/Interaction: 1Period/week</b>		<b>Semester end examination: 70 marks</b>

**Objectives:**

- To explain the paradigms and approaches used to analyze and design algorithms.
- To discuss efficient algorithms for simple computational tasks.
- To give an idea of time and space complexities of an algorithm.
- To get familiar with the behavior of algorithms for analyzing tractable and intractable problems.

**Outcomes:**

Students will be able to

- Design an algorithm and analyze its efficiency.
- Apply Brute Force techniques and perform various searching and sorting methods.
- Understand different techniques like Divide & Conquer, Decrease & Conquer and Transform & Conquer.
- Know a variety of greedy algorithms, dynamic programming approaches used to test for optimality.
- Understand Backtracking, Branch and Bound techniques and the basics of P and NP problems.

**Prerequisites:**

Discrete Mathematics, Probability & Statistics and Data Structures.

**Syllabus:****UNIT-I**

INTRODUCTION: Notion of Algorithm, Fundamentals of Algorithmic Problem Solving- Understanding the problem, deciding on appropriate data structures, Algorithm Design techniques, Methods of specifying an algorithm, proving an algorithm's correctness, Analyzing and coding an Algorithm. Fundamentals of the Analysis of Algorithm Efficiency Analysis framework and Asymptotic Notations and Basic Efficiency Classes

**UNIT-II**

BRUTE FORCE AND EXHAUSTIVE SEARCH: Selection sort, Bubble sort, Sequential search, Brute-Force String Matching. Exhaustive search- Travelling salesman problem, knapsack problem and Assignment problem.

**UNIT-III**

DIVIDE-AND-CONQUER: Mergesort, Quicksort, Binary Search, Binary Tree Traversals and Related Properties, Multiplication of large integers, Strassen's Matrix Multiplication.

DECREASE-AND-CONQUER & TRANSFORM-AND-CONQUER: DECREASE-AND-CONQUER Insertion Sort, Topological Sorting, Decrease-by-ConstantFactor Algorithms fake-coin problem, Josephus problem. TRANSFORM-AND-CONQUER Presorting, Heaps and heap sort, Horner's rule.

**UNIT-IV**

GREEDY TECHNIQUE: Prim's Algorithm, Kruskal's Algorithm Disjoint Subsets and Union-Find Algorithms, Dijkstra's Algorithm, Huffman trees.

DYNAMIC PROGRAMMING: Elements of DP, Matrix- chain multiplication, The Knapsack Problem and Memory Functions, Optimal Binary Search Trees, Warshall's and Floyd's Algorithms.

**UNIT-V**

LIMITATIONS OF ALGORITHM POWER: Decision Trees Decision Trees for Sorting Algorithms and Decision Trees for Searching Sorted Array. P, NP, and NP-complete Problems.

COPING WITH THE LIMITATIONS OF ALGORITHM POWER : Backtracking n-queens problem, Hamiltonian Circuit problem, Subset-sum problem. Branch-and-Bound Assignment Problem, Knapsack Problem and Travelling Salesman problem.

**Text Book:**

Introduction to The Design & Analysis of Algorithms, Anany Levitin, 2<sup>nd</sup> Edition, Pearson Education, 2007.

**Reference Books:**

1. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein, 2ndEdition, PHI, 2006.
2. The design and Analysis of Computer Algorithms, 2<sup>nd</sup> Edition, Ellis Horowitz, SartajSahni and Rajasekharam, Galgotia publications.
3. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.

**e- Learning Resources:**

1. <http://nptel.ac.in/courses/106101060/> .
2. <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-introduction-to-algorithms-sma-5503-fall-2005/video-lectures/> .

## 3/4 B.Tech - FIRST SEMESTER

<b>IT5T3</b>	<b>DATA COMMUNICATIONS AND COMPUTER NETWORKS</b>	<b>Credits: 3</b>
<b>Lecture: 3 Periods/week</b>		<b>Internal assessment: 30 marks</b>
<b>Practice/Interaction: 1Period/week</b>		<b>Semester end examination: 70 marks</b>

**Objectives:**

- To understand the fundamental concepts of data communication.
- Familiarize with the basic taxonomy and terminology of computer networking.
- To discuss advanced networking concepts like client server paradigm.

**Outcomes:**

Students will be able to

- Understand the various standard network models, types of networks and network topologies.
- Implement techniques include framing, error correction, error detection and flow control protocols.
- Understand various Internet Protocol Versions and classification of addressing.
- Implement various Routing algorithms.
- Understand Transport layer Services and Transfer protocols TCP, UDP and their use in Real Time Scenarios.

**Syllabus:****UNIT – I**

Introduction: Data Communication, components, data representation, data flow; Networks: physical structures, network models, categories of network, inter connection of networks, Network Models: Layered Tasks, sender, receiver, carrier, and hierarchy. The OSI models: layered architecture, peer to peer process, encapsulation, Layers in OSI model, TCP/IP protocol suite, Addressing: physical address, logical address, port address, specific address.

**UNIT –II**

Framing: fixed size framing, variable size framing, Flow control, Error control Error detections Error correction: block coding, linear block codes, cyclic codes: cyclic redundancy check, polynomials, cyclic code analysis, advantages, Checksum: idea, one's complement internet check sum, Elementary Data link Layer protocols: Noiseless Channels, Simplest protocol, Stop-and Wait protocol,

**UNIT-III**

Noisy Channels, Stop and Wait Automatic repeat request, Go Back N Automatic Repeat Request, Selective Repeat Automatic Repeat Request, and Piggybacking, Network Layer,IPV4 Addresses, Address space, Notations, Classful addressing, Classless Addressing, Internetworking,IPV4, Datagram, fragmentation,checksum,options,IPV6,advantages,packet format, Extension Headers.

**UNIT –IV**

Network Layer: Delivery, Forwarding: Forwarding Techniques, and, Forwarding Process, Routing Table routing, Unicast Routing Protocols: Optimization, Intra and Inter domain Routing distance vector routing algorithm, Link State Routing Algorithm, Multicast Routing Algorithms: Unicast ,Multicast, Broadcast, Multicast Routing, Routing Protocols

**UNIT-V**

Transport Layer: Process to process Delivery: Client/Server Paradigm, Multiplexing and Demultiplexing, Connectionless Versus Connection-Oriented Service, Reliable Versus Unreliable, User datagram Protocol: Well known ports for UDP, User Datagram, Checksum,

UDP Operations, and Transmission Control Protocol (TCP): TCP Services, TCP Features, Segment, A TCP Connection, Flow Control, Congestion Control.

**Text Books:**

- 1) Data communications and networking 4<sup>th</sup> Edition Behrouz A Fourzan, TMH
- 2) Computer networks 4<sup>th</sup> Edition Andrew S Tanenbaum, Pearson

**Reference Books:**

- 1) Computer networks, A system Approach, 5<sup>th</sup> Edition, Larry L Peterson and Bruce S Davie, Elsevier

**e-Learning Resources:**

- 1) [http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New\\_index1.html](http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html)

## 3/4 B.Tech - FIRST SEMESTER

**IT5T4****WEB TECHNOLOGIES****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To study the basic concepts of Hypertext Markup Language, Cascading Style Sheets and java script for creating dynamic websites
- To perform operations on data among web applications using XML.
- To create software components using Java Beans.
- To Develop Server-Side Programming using JDBC, Servlets, Java Server Pages and AJAX.

**Outcomes:**

Students will be able to

- Develop advanced HTML pages with the help of tags, CSS and scripting language.
- Develop user defined tags to exchange the data and object communication using Java beans.
- Understand the concepts of 3 Tier architecture using JDBC and servlets.
- Get acquaintance on client server communication using cookies and session Management.
- Understand the dynamic content by using JSP architecture and its application model.

**Prerequisite:**

Java.

**Syllabus:****UNIT – I**

**INTRODUCTION TO WEB TECHNOLOGIES:** History of the web, Overview of HTTP, HTML Introducing HTML document structure, Creating Headings, links, paragraph, images, tables, frames, forms and html controls on a web page.

**INTRODUCING CASCADING STYLE SHEETS:** Inline, External, Internal, Style class, Multiple styles, Introducing JavaScript , Using Variables, Using Operators, Working with Control Flow statements, Working with functions, Handling Events, Using Arrays, Creating objects in Java Script.

**UNIT – II**

**WORKING WITH XML:** Introduction to XML, XML Basics, XML Technologies, Extensible HTML (XHTML), Java API for XML Processing, Document Object Model (DOM), Extensible Style Sheet Language Transformation (XSLT).

**WORKING WITH JAVA BEANS:** Introducing Java Beans, Introspection Design Patterns for properties, methods, events, creating of a Simple Bean using BDk (optional), bean API.

**UNIT –III**

**WORKING WITH DATABASE:** Getting started with JDBC, Defining ODBC, Introduction to JDBC, Components of JDBC, JDBC Architecture, Types of Drivers, Working with JDBC APIs, Creating a Simple Application, Working with Prepared Statement, Using Callable Statement.

**WORKING WITH SERVLETS:** Introducing the MVC architecture, Describing Servlets, Understanding Servlets, What are servlets, Introducing the Servlet API, Servlet Life Cycle, Developing First Servlet Application, Generic Servlet Class.

#### **UNIT –IV**

**WORKING WITH REQUESTS & RESPONSES:** Understanding Request Processing and HTTP Describing the Servlet Request Interface, Working with Initialization Parameters, Describing Request Attributes, request dispatcher interface, Describing HTTP basics, Problem with Servlets.

#### **UNIT –V**

**WORKING WITH JSP:** Introduction to JSP, Understanding JSP, Describing the JSP Life Cycle, Creating a Simple JSP pages, working with JSP basic tags and implicit objects, working with Java Beans and Action tags in JSP, Working with JSP standard Tag Library (JSTL), Introduction to AJAX.

#### **Text Books:**

1. Web Technologies, Black Book, Kogent Learning Solutions Inc, Dreamtech Press.
2. JDBC, Servlets, and JSP, New Edition, Santhosh Kumar K, Kogent Learning Solutions Inc, Dreamtech Press

#### **Reference Books:**

1. Web Technologies ,Uttam K. Roy, Volume 2 , Oxford University
2. Core Servlets and Java Server Pages Volume 1 CORE TECHNOLOGIES , Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program ,Dietel and Nieto
4. An Introduction to Web Design and Programming –Wang-Thomson
5. Professional Java Server Programming S.AllamRaju and othersApres(dreamtech)
6. Java Server Programming ,IvanBayross and others,The X Team,SPD
7. Beginning Web Programming-Jon Duckett WROX.
8. Java Server Pages, Pekowsky, Pearson.
9. Java Script,D.Flanagan,O'Reilly,SPD.

#### **e-Learning Resources:**

1. <http://nptel.ac.in/courses/106105084/13>
2. <http://www.w3schools.com/>

## 3/4 B.Tech - FIRST SEMESTER

**IT5T5****MICROPROCESSORS AND MICROCONTROLLERS****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To develop an in-depth understanding of the operation of microprocessors and microcontrollers, and write assembly language programs.
- To understand various interfacing techniques for microprocessor.
- To understand design and implementation of microprocessor-based systems in both hardware and software.

**Outcomes:**

Students will be able to

- Interface 8086 microprocessor with the external memory chips
- Develop programs using different class of instructions for 8086 microprocessor and 8051 microcontroller.
- Design and develop real time application modules using ARM microcontroller.

**Prerequisites:**

C programming, Computer Architecture and Organization

**UNIT-I**

Introduction to Microprocessors: Introduction and evolution of microprocessors, Architecture of 8085 processor, pin configuration of 8085, bus organization, and basic instruction sets.

**UNIT-II**

Instruction sets and programming of 8086: Architecture and features of 8086, pin configuration of 8086, minimum mode and maximum mode, timing diagrams, Addressing modes. Data transfer instructions, arithmetic instructions, logical instructions, flag manipulation instructions, control transfer instructions, shift / rotate, string instructions &amp; related programs

**UNIT-III**

Microcontroller: Introduction to 8051 microcontroller, architecture, memory organization, special function registers, on chip resources, Addressing modes of 8051 and basic instruction set of 8051.

**UNIT- IV**

ARM Architecture: introduction to 16/32 bit processors, ARM Architecture, ARM Instruction sets, thumb instruction set, thumb instruction format.

**UNIT-V**Development tools for ARM: Introduction to micro controller development tools, Serial peripheral interface I<sup>2</sup> C Bus, ADC , UART – Stepper Motor Control - DC Motor Control.

**Text Books:**

1. Microprocessors & Interfacing, Douglas.V. Hall, 3<sup>rd</sup> Edition, Pearson/ PHI. 2007
2. Microcontrollers, Architecture, programming, Interfacing and system design, Rajkamal, Pearson, 4<sup>th</sup> Edition.2010

**Reference Books:**

1. Microprocessors & Controllers, N.Senthil Kumar, Oxford University press 2010.
2. Micro Computer System 8086/8088 Family Architecture, Programming and Design - Liu and GA Gibson, 2<sup>nd</sup> Edition., PHI.
3. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, Tata Mc Hill, 2000.
4. Micro Controllers – Deshmukh, Tata McGraw Hill Edition.6<sup>th</sup> reprint, 2007.



## 3/4 B.Tech - FIRST SEMESTER

IT5L1

UNIX LAB

Credits: 2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To familiarize students with the UNIX environment
- To learn a variety of common Unix utilities
- To learn the fundamentals of shell scripting/programming
- To write C Programs that use Unix system call interface.

**Outcomes:**

Students will be able to

- Implement the basic commands and file system utilities in unix environment.
- Develop programs using shell scripting.
- Implement various commands using system calls.
- Develop programs using Inter process communication mechanisms

**Prerequisite:**

C Programming.

**Exercise1**

- a) Practice session on basic Unix Utilities
- b) Practice Session on File related Utilities

**Exercise2**

- a)Practice session on Security and File permission Utilities
- b)Practice Session on Disk utilities
- c) Practice Session on Process Utilities

**Exercise3**

Practice Session on Text Processing Utilities.

**Exercise4**

Session-1 (Introduction to Vi editor)

- a)Log into the system
- b)Use vi editor to create a file called myfile.txt which contains some text.
- c)correct typing errors during creation.
- d)Save the file z
- e)logout of the system

Session-2

- a)Log into the system
- b)open the file created in session 1
- c)Add some text
- d)Change some text
- e)Delete some text

- f) Save the Changes
- g) Logout of the system

### Exercise 5

- a) Log into the system
- b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

- c) Use the cat command to display the file, mytable.
- d) Use the vi command to correct any errors in the file, mytable.
- e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
- f) Print the file mytable
- g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
- h) Print the new file, mytable
- i) Logout of the system.

### Exercise 6

- a) Login to the system
- b) Use the appropriate command to determine your login shell
- c) Use the /etc/passwd file to verify the result of step b.
- d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
- e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

### Exercise 7

- a) Write a shell script to generate a multiplication table.
- b) Write a shell script that copies multiple files to a directory.
- c) Write a shell script which counts the number of lines and words present in a given file.

### Exercise 8

- a) Write a shell script which displays list of all files in the given directory.
- b) Write a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns remainder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add (-a), subtract (-s), multiply (-m), quotient (-c) and remainder (-r).

### Exercise 9

Implement in C the following unix commands using system calls.

- (a) cat
- (b) ls
- (c) mv

**Exercise10**

Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

- (a) File type
- (b) Number of links
- (c) Read, write and execute permissions
- (d) Time of last access

(Note : Use stat/fstat system calls)

**Exercise11**

Write a C program to create a child process and to print odd numbers in child process where as the parent process prints even numbers

**Exercise12**

Write a C Program to illustrate the concept of Signal handling. For Example when user press Cntl+C the system has to display "Don't Type Cntl+C".

**Exercise13**

Write a C program to illustrate the concept of pipe and FIFO.

**Reference Books:**

- 1) Introduction to UNIX & SHELL programming, M.G. Venkatesh Murthy, Pearson Education.
- 2) Unix concepts and applications, 4<sup>th</sup> Edition, Sumitabha Das, TMH.
- 3) Unix for programmers and users, 3<sup>rd</sup> Edition, Gaham Glass & K. Ables, Pearson education.
- 4) Unix and shell Programming –A text book, B.A. Forouzan & R.F. Giberg, Thomson.

## 3/4 B.Tech - FIRST SEMESTER

IT5L2

MICROPROCESSORS AND MICROCONTROLLERS LAB

Credits:2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- Familiarize the architecture of 8086 processor, assembling language programming and Interfacing with various modules.
- The student can also understand 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers.

**Outcomes:**

Students will be able to

- Apply knowledge of the microprocessor's internal registers and operations by use of a PC based microprocessor simulator.
- Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.
- Develop assembly language programs and download the machine code that will provide solutions such as fluid level control, temperature control, and batch processes.

**Prerequisites:**

C Programming, Computer System Architecture.

**Experiments:**

1. Introduction to Debugger / XT86 / TASM: 8-bit Arithmetic Operations.
2. 16-bit Signed and unsigned Arithmetic operations, ASCII – arithmetic operations.
3. Arithmetic operations – Multi byte Addition and Subtraction, Sum of Squares, Sum of Cubes.
4. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
5. 8255 – PPI: Write ALP to generate sinusoidal wave using PPI.
6. Using string operation and Instruction prefix: Move Block, Reverse string, String comparison
7. Write ALP to find smallest, largest number, arrange numbers in Ascending order, Descending order in a given series.
8. Traffic Lights Interface.
9. Stepper Motor Interface
10. 8279 – Keyboard Display: Write a small program to display a string of characters.
11. ADC Interface / DAC Interface.
12. Arithmetic Operations using 8051.
13. Reading and Writing on a parallel port.
14. Timer in Different Modes
15. Serial Communication using 8051.

3/4 B.Tech - FIRST SEMESTER

IT5L3

WEB TECHNOLOGIES LAB

Credits: 2

Lab: 3 Periods/week

Internal assessment: 25 marks  
Semester end examination: 50 marks**Objectives:**

- To create static and dynamic Web pages.
- To create DTD and XML schema for defining XML Documents.
- To develop Pure Dynamic Web Application using JDBC.
- To develop Server Programming dynamically using Servlets and Java Server Pages.

**Outcomes:**

Students will be able to

- Develop static / dynamic web pages using HTML, CSS and java script.
- Populate XML data using XML schema.
- Perform SQL operations on data using JDBC and Servlets.
- Generate the dynamic content using JSP.

**Exercise-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 "IT" the catalogue for IT 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.

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

## 2) LOGIN PAGE:

This page looks like below:





Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE	<div style="text-align: center;"> <p>Login <input type="text"/></p> <p>Password <input type="text"/></p> <p><input type="button" value="Submit"/>   <input type="button" value="Reset"/></p> </div>			
ECE				
EEE				
CIVIL				

## 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.

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

Note contains the remaining pages and their description.

**Exercise-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

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Book name  Java 2 XML bible	Price  \$35.5 \$40.5	Quantity  2 1  Total amount -	Amount  \$70 \$40.5  \$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)
- 8) Address (text area)

### Exercise-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.

### Exercise—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.
- 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
- 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 file HTML
- 4) Define styles for links as A:link
  - A:visited
  - A:active
  - A:hover
- 5) Work with layers
- 6) Add a customized cursor Selector
  - {cursor:value}



**Exercise—5:**

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

- |                      |                |           |
|----------------------|----------------|-----------|
| 1) Title of the book | 2) Author Name | 3) 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

**Exercise—6:**

- 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 Exercise--1 and Exercise--2 in the document root.

Access the pages by using the urls <http://localhost4040/rama/books.html>

(for tomcat) <http://localhost8080/books.html> (for Apache).

**Exercise—7:**

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 (Exercise-1) 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.

**Exercise —8:**

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 (Exercise- 2).

**Exercise—9:**

Write a JSP which does the following job

Insert the details of the 3 or 4 users who register with the web site (Exercise- 9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to Exercise- 8 instead of cookies).

**Exercise—10:**

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 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.

**Reference Books:**

1. Web Technologies, Black Book, Kogent Learning Solutions Inc, Dreamtech Press.
2. JDBC, Servlets, and JSP, New Edition, Santhosh Kumar K Kogent Learning Solutions Inc, Dreamtech Press
3. Internet and World Wide Web – How to program , Dietel and Nieto

**e-Learning Resources:**

1. <http://www.w3schools.com/html/default.asp>

## 3/4 B.Tech - FIRST SEMESTER

**IT5L4          ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS LAB          Credits: 2**  
**Internal assessment: 25 marks**  
**Lab: 3 Periods/week          Semester end examination: 50 marks**

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**Objectives:**

- To focus on using computer-aided multimedia lab for developing linguistic ability and communicative competence
- To make the students aware of the requirements of the industry and make them ready for future needs.
- To improve the student's fluency and enable them to respond appropriately in different socio-cultural and professional contents.
- To improve their writing skills.

**Outcomes:**

Students will be able to

- Improve their Communicative competence.
- Acquire Leadership qualities.
- Develop Presentation Skills.
- Acquire Interview Skills.
- Develop Vocabulary and writing skills.

**Syllabus:****Activity 1.**

Public Speaking and Emceeing

**Activity 2.**

Group Discussions

**Activity 3.**

Seminars and Presentations

**Activity 4.**

Preparing Resume and Covering Letter, Interview Skills

**Activity 5.**

Vocabulary Development, Report Writing

**Reference Books:**

1. An Approach to Communication Skills – Bhanu Ranjan Dhanpati Rai & co.
2. A Practical Guide To Writing And Speaking – John Seely Oxford
3. Better English Pronunciation – J.D.O.Connor

## 3/4 B.Tech - SECOND SEMESTER

**IT6T1****SOFTWARE ENGINEERING****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To understand Basic Software Engineering principles, practices, and its applications.
- To introduce software process models, identifying software requirements and steps in preparing Software Requirement Specification.
- To understand the project management techniques.
- To create awareness on different software testing approaches and assessing the quality of software.

**Outcomes:**

Students will be able to

- Acquire knowledge of basic Software engineering principles and its applications.
- Understand the different software process models.
- Prepare effective Software Requirement Specification document.
- Understand the importance of project management.
- Understand different testing approaches and to ensure quality of software.

**Syllabus:****Unit - I**

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

The software problem: Cost, schedule and quality, Scale and change .

**Unit - II**

Software Process: Process and project, component software process, Software development process models: Waterfall model, prototyping, iterative development, relational unified process, time boxing model, Extreme programming and agile process, using process models in a project. Project management process.

**Unit - III**

Software requirement analysis and specification: Value of good SRS, requirement process, requirement specification, functional specifications with use-cases, other approaches for analysis, validation.

Software Architecture: Role of software architecture, architecture views, components and connector view, architecture styles for C & C view, documenting architecture design, evaluating architectures.

**Unit - IV**

Planning a software project: Effort estimation, project schedule and staffing, quality planning, risk management planning, project monitoring plan, detailed scheduling.

Design: Design concepts, function-oriented design, object oriented design, detailed design, verification, metrics

**Unit - V**

Coding and Unit Testing: Programming principles and guidelines, incrementally developing code, managing evolving code, unit testing, code inspection, metrics.

Testing: Testing concepts, testing process, black-box testing, white-box testing, and metrics.

**Text Books:**

1. Software Engineering, A Precise approach, Pankaj Jalote, Wiley.
2. Software Engineering, 6<sup>th</sup> Edition, Roger S.Pressman , TMH.

**Reference Books:**

1. Software Engineering, 8/e, Somerville, Pearson.
2. Software Engineering principles and practice, W S Jawadekar, TMH.
3. Software Engineering concepts, R Fairley, TMH.

**e-Learning Resources:**

1. <http://www.cse.iitd.ac.in/ConciseIntroToSE>
2. <http://nptel.ac.in/downloads/106105087/>

## 3/4 B.Tech - SECOND SEMESTER

**IT6T2****COMPUTER GRAPHICS AND ALGORITHMS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce the basics of graphics through OpenGL.
- To discuss the basic input devices and interaction of computer graphics.
- To provide the basics of transformations and projections.
- To discuss different types of clipping algorithms, rasterization techniques.

**Outcomes:**

Students will be able to

- Develop and build an interactive graphics program using the OpenGL application programming interface.
- Design menus and display lists by using various input devices.
- Develop and differentiate 2D and 3D transformations.
- Understand different types of projections.
- Understand different types of the clipping algorithms and rasterization techniques.

**Prerequisites:**

Classic Data Structures, Engineering Mathematics-I and Engineering Mathematics-II

**Syllabus:****UNIT-I**

INTRODUCTION: Applications of computer graphics, A graphics system, The programmer's interface, Graphics architectures, Programmable pipelines, Performance characteristics.

The OpenGL: The OpenGL API, Primitives and attributes, Color, Viewing, Control functions, Polygons and recursion.

**UNIT-II**

INPUT AND INTERACTION: Interaction, Input devices, Clients and servers, Display lists, Display lists and modeling, Programming event-driven input, Menus, Picking, Building interactive models, Animating interactive programs, Design of interactive programs, Logic operations.

**UNIT-III**

GEOMETRIC OBJECTS AND TRANSFORMATIONS-1: Scalars, points, and vectors, Three-dimensional primitives, Coordinate systems and frames, Affine transformations, Rotation, translation and scaling.

GEOMETRIC OBJECTS AND TRANSFORMATIONS-2: Transformations in homogeneous coordinates, Concatenation of transformations, OpenGL transformation matrices, Interfaces to three-dimensional applications.

**UNIT-IV**

VIEWING: Classical and computer viewing, Viewing with a computer, Positioning of the camera, Simple projections, Projections in OpenGL, Hidden-surface removal, Interactive mesh displays, Parallel-projection matrices, Perspective-projection matrices, Projections and shadows.

**UNIT-V**

IMPLEMENTATION : Basic implementation strategies, The major tasks, Clipping, Line-segment clipping, Polygon clipping, Clipping of other primitives, Clipping in three dimensions, Rasterization, Bresenham's algorithm, Polygon rasterization, Hidden-surface removal.

**Text Books:**

1. Edward Angel, "Interactive Computer Graphics A Top-Down Approach using OpenGL", Pearson Addison-Wesley, 5<sup>th</sup> Edition, 2008.

**Reference Books:**

1. F.S. Hill,Jr, and M. Kelley, Jr. "Computer Graphics Using OpenGL", Pearson/PHI, 3<sup>rd</sup> Edition, 2009.
2. James D Foley, Andries Van Dam, Steven K Feiner, John F Hughes, "Computer Graphics", Addison-wesley 1997.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/106102065/>
2. <http://nptel.ac.in/courses/106102063/>
3. <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-837-computer-graphics-fall-2012/lecture-notes/>
4. <http://textofvideo.nptel.iitm.ac.in/video.php?courseId=106106090>

## 3/4 B.Tech - SECOND SEMESTER

**IT6T3****OBJECT ORIENTED ANALYSIS AND DESIGN****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide knowledge of the underlying foundations on object-oriented design and analysis.
- To apply various models for a software application using UML.
- To depict various views used in analysis and design phases of a software project.
- To discuss case studies and creation of respective models.

**Outcomes:**

Students will be able to

- Understand the importance and basic concepts of modeling.
- Analyze problems and develop structural diagrams.
- Construct various UML diagrams to model the behavior of the system.
- Construct various UML diagrams to model reactive systems.
- Become familiar with architectural modeling and practice various models for a given application.

**Syllabus:****UNIT - I**

Introduction to UML

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

Basic Structural Modeling Classes, Relationships, Common Mechanisms and diagrams.

**UNIT - II**

Advanced Structural Modeling

Advanced classes, Advanced Relationships, Interfaces, Types and Roles, Packages.

Class &amp; Object Diagrams Terms and concepts, Common modeling techniques for Class &amp; Object Diagrams.

**UNIT -III**

Basic Behavioral Modeling

Interactions: Terms and Concepts, Common Modeling Techniques, Interaction diagrams: Terms and concepts, Common modeling techniques.

Basic Behavioral Modeling-II Use cases, Use case Diagrams, Activity Diagrams: Terms and Concepts, Common Modeling Techniques

**UNIT - IV**

Advanced Behavioral Modeling

Events and signals, state machines, processes and Threads, time and space, State Chart diagrams: Terms and Concepts, Common Modeling Techniques.



**UNIT – V**

Architectural Modeling

Component, Deployment, Component diagrams and Deployment diagrams: Terms and Concepts, Common Modeling Techniques.

Case Study: Implementing a Web Based Auction System using UML and Component-Based Programming

**Text Books:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education. Rob Pandey, Pauline Wilcox:
2. Applying UML Advanced Application, Elsevier.

**Reference Books:**

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY Dreamtech India Pvt. Ltd.
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. Craig Larman Applying UML and Patterns: An introduction to Object - Oriented Analysis and Design and Unified Process, Pearson Education .

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/122105022/27A>
2. [http://www.csm.ornl.gov/~sheldon/public/sheldonf\\_auction.pdf](http://www.csm.ornl.gov/~sheldon/public/sheldonf_auction.pdf)

## 3/4 B.Tech - SECOND SEMESTER

**IT6T4****DATA MINING AND DATA WAREHOUSING****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide an overview of the techniques and developments in the data warehousing and mining.
- To explain the role of data warehousing techniques and applicability in commercial data.
- To characterize the kinds of patterns using association rule mining and classification.
- To introduce basic concepts of clustering and outliers present in data.

**Outcomes:**

Students will be able to

- Understand the basic principles of Data Mining and data preprocessing.
- Differentiate the concepts of data warehousing and OLTP.
- Relate the learned algorithms in association and pattern mining to the practical issues.
- Describe and utilize a range of techniques for classifying the data and accuracy improvements.
- Analyze the data and develop some clustering and outlier methods.

**Prerequisite:**

Database Systems

**Syllabus:****UNIT – I**

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining. Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Discretization.

**UNIT – II**

Data Warehousing and Online Analytical Processing: Basic Concepts, Data Warehouse Modeling: Data Cube and OLAP. Data Objects and Attribute Types, Basic Statistical Description of Data, Measuring Data Similarity and Dissimilarity.

**UNIT – III**

Mining Frequent Patterns, Associations, and Correlations: Basic Concepts, Frequent Item set Mining Methods, Pattern Evaluation Methods, and Pattern Mining in Multilevel, Multidimensional Space.

**UNIT-IV**

Classification: Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy.

**UNIT – V**

Cluster Analysis: Basic Concepts and Methods, Cluster Analysis, Partitioning Methods, Hierarchical Methods. Cluster Analysis: Density-Based Methods, Grid-Based Methods, Evaluation of Clustering. Outlier Detection: Outliers and Outlier Analysis, outlier Detection Methods. Introduction to text mining.

**Text Book:**

1. Data Mining – Concepts and Techniques – 3<sup>rd</sup> Edition, Jiawei Han, Micheline Kamber & Jian Pei-Elsevier.

**Reference Books:**

1. Introduction to Data Mining: Pang-Ning Tan, Michael Steinbach, VipinKumar, Pearson
2. Data Mining Techniques – Arun K Pujari, University Press.
3. Data Warehousing in the Real World – Sam Anahory& Dennis Murray. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PaulrajPonnaiah Wiley Student Edition.
5. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition.

**e-Learning Resources:**

1. <https://weka.waikato.ac.nz/explorer>
2. <http://rapidminerresources.com>
3. <https://www.coursera.org>

## 3/4 B.Tech - SECOND SEMESTER

**IT6T5FE1****CLIENT SERVER COMPUTING****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide knowledge on construction of a complete end-to-end information system.
- Exposure to middleware technologies on client server environment.
- To demonstrate the concepts of core CORBA and Extensional CORBA.
- To provide basic knowledge on java beans and EJBs.

**Outcomes:**

Students will be able to

- Understand the basic concepts of client server computing.
- Differentiate various client server invocations in CORBA /JAVA.
- Understand the basic concepts of IDL Mappings.
- Know the creation of bean components using CORBA and JAVA.
- Understand the concept of Ejb in client server environment.

**Syllabus:****UNIT-I**

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

CORBA with Java: Review of Java concept like RMI, RMI API and JDBC, Client/Server CORBA-style, the object web CORBA with Java.

**UNIT- II**

Core CORBA /Java: Two types of Client/ Server invocations-static, dynamic, the static CORBA, first CORBA program, ORBlets with Applets.

**UNIT-III**

Extensional CORBA: CORBAIDL mapping CORBA java- to- IDL mapping.

**UNIT-IV**

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

**UNIT-V**

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 2<sup>nd</sup> Edition.
2. Java programming with CORBA 3rd Edition, G.Brose, A Vogel and K.Duddy, Wiley-dreamtech, India John wiley and sons.

**Reference Books:**

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.

**e-Learning Resources:**

1. <http://www.slideshare.net/jayasreep3/client-servercomputing>
2. <http://nptel.ac.in/courses/106105084/30> (NPTEL)
3. <https://www.youtube.com/watch?v=OEPaNB-X99Y> (NPTEL)

## 3/4 B.Tech - SECOND SEMESTER

**IT6T5FE2****EMBEDDED SYSTEM DESIGN****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide the basic concepts of Embedded System.
- To introduce 8051 microcontroller programming concepts and System design for Hardware and software point of view.
- To introduce Real Time Operating System concepts for coding the embedded system software routines.
- To demonstrate tools and methodologies needed for embedded system design.

**Outcomes:**

Students will be able to

- Understand the basics of Embedded system.
- Understand the basic architecture of 8051 micro controller.
- Develop 8051 microcontroller programming.
- Understand the concepts of Real Time Operating Systems.
- Gain knowledge on various Embedded software development tools.

**Prerequisite:**

Microprocessors and Micro Controllers.

**Syllabus:****UNIT -I**

Embedded Systems Basics: Introduction to Embedded systems, Examples of embedded systems, Typical Hardware, Gates, Timing Diagrams, Memory, Microprocessors, Buses, Direct Memory Access, Microprocessor Architecture, Interrupt Basics.

**UNIT -II**

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/output Pin Ports and Circuits, External Memory, Serial data Input/output, Interrupts.

**UNIT- III**

Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming with 8051.

Moving Data: Introduction, Addressing Modes, External Data Moves, Code Memory Read-Only Data Moves, Push and Pop Opcodes, Data Exchanges.

**UNIT- IV**

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.

**UNIT- V**

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.

**Text Books:**

1. An Embedded Software Primer- David E. Simon, Pearson Education.
2. The 8051 Microcontroller- Third Edition, Kenneth J.Ayala, Thomson.

**Reference Books:**

1. 8051 Microcontrollers, Satish Shah, Oxford Higher Education.
2. Embedded Microcomputer Systems Real Time Interfacing, Jonathan W.Valvano, Cengage Learning.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.

**e- Learning Resources:**

1. <http://www.jntuk-coeerd.in/>
2. <http://elearning.vtu.ac.in/06ITBM52.html>
3. <http://nptel.ac.in/video.php?subjectId=108102045>
4. <https://docs.google.com/file/d/0B0DfyDcYZ0AbU3VkOVZoV21nNzg/edit>

## 3/4 B.Tech - SECOND SEMESTER

**IT6T5FE3****DISTRIBUTED OPERATING SYSTEMS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide an overview of the concepts of distributed operating systems.
- To discuss about different types of communication procedures in a distributed operating systems environment.
- To explain the synchronization mechanism.
- To know about processor allocation and threads.
- To demonstrate the distributed file system.

**Outcomes:**

Students will be able to

- Understand the concepts of distributed operating systems.
- Gain knowledge on different communication protocols.
- Understand the concepts of synchronization and deadlocks.
- Gain knowledge on threads, processor allocation and scheduling algorithms.
- Understand the distributed file system.

**Prerequisite:**

Operating System Concepts

**Syllabus:****Unit -I**

Introduction to distributed systems:

Goals, Hardware concept, Software concept, Design issues.

**Unit -II**

Communication in Distributed systems:

Layered protocols, The client-server model, Remote procedure call, Group communication

**Unit- III**

Synchronization in Distributed systems:

Clock Synchronization, Mutual Exclusion, Election Algorithms, Deadlocks in distributed systems

**Unit -IV**

Processes and Processors in distributed systems:

Threads, System models, Processor Allocation, scheduling in distributed systems

**Unit- V**

Distributed File Systems:

Distributed file system design, trends in distributed file systems, What is shared memory, case study- MACH



**Text book:**

1. Distributed Operating Systems, Andrew S.Tanenbaum, Pearson education.

**Reference Books:**

1. Abraham Silberschatz, Peter B. Galvin, G. Gagne, “ Operating System Concepts”, 8<sup>th</sup> Edition, Addison Wesley publishing Co.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, 2001.
3. Mukesh Singhal and N.G. Shivaratri, “Advanced Concepts in Operating Systems”, McGraw – Hill, 2000.

**e-Learning Resources:**

1. <http://nptel.ac.in/downloads/106106107/>
2. <http://www.youtube.com/watch?v=hNOEL3SM9No&list=PL765D8EEE5113BA3E>
3. <http://www.jntuk-coeerd.in/>

## 3/4 B.Tech - SECOND SEMESTER

<b>IT6T5FE4</b>	<b>ADVANCED COMPUTER SYSTEM ARCHITECTURE</b>	<b>Credits:3</b>
<b>Lecture: 3 Periods/week</b>		<b>Internal assessment: 30 marks</b>
<b>Practice/Interaction: 1Period/week</b>		<b>Semester end examination: 70 marks</b>

**Objectives:**

- To focus on design aspects of the processor and pipe lining
- To Introduce the concepts of super scalar and memory hierarchies
- To Demonstrate simulation techniques

**Outcomes:**

Students will be able to

- Understand the classes of computers, and new trends and developments in computer architecture
- Understand the concepts of pipelining, instruction set architectures, memory addressing.
- Understand the performance metrics of microprocessors, memory, Networks, and disks
- Understand the various techniques to enhance a processors ability to exploit Instruction-level parallelism (ILP), and its challenges.

**Pre requisite:**

Computer System Architecture

**Syllabus:****UNIT-I**

Introduction to Parallel Processing: Parallel Computer Structures, Architectural Classification Parallel Processing Applications.

**UNIT-II**

Memory and I/O sub-systems: Hierarchical Memory Structures, Cache Memories and Management, I/O sub-systems

**UNIT-III**

Principles of Pipelining and Vector Processing: Pipelining, Instruction and Arithmetic Pipelines, Principles of designing pipelined processors,

**UNIT-IV**

Structures and Algorithms of Array Processors (SIMD Computers): SIMD Array Processors, SIMD Interconnection networks, Parallel Algorithms for Array Processors Algorithm examples – matrix multiplication.

**UNIT-V**

Multiprocessor Architecture and Programming: Functional Structures, Interconnection Networks, Multi Processor Operating Systems.

**Text Book:**

1. Kai Hwang and F. A. Briggs, Computer Architecture and Parallel Processing, Tata McGraw Hills

**Reference Books:**

1. Hennessy Patterson, Computer Architecture, A quantitative Approach , 5<sup>th</sup> Edition, Elsevier.
2. Dongarra, Foster, Fox & others, Source Book of parallel Computing, Elsevier.
3. M.J Quinn, Designing Efficient Algorithms for Parallel Computers, McGrawHil

**e-Learning Resources:**

1. [http://onlinevideolecture.com/?course\\_id=1309](http://onlinevideolecture.com/?course_id=1309)
2. <http://nptel.ac.in/video.php?subjectId=106102062>

## 3/4 B.Tech - SECOND SEMESTER

**IT6T5FE5****OBJECT ORIENTED PROGRAMMING THROUGH JAVA****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To Describe the principles of object oriented programming paradigm and terminology
- To introduce basic concepts of java programming.
- To discuss objects, classes , interfaces, exceptions, and Multi threading in java
- To demonstrate oops principles through problem analysis.
- To discuss the concepts of java API through programming.

**Outcomes:**

Students will be able to

- Understand the concepts of Object Oriented Programming and basics of java programming language.
- Identify classes, objects, members of a class and the concept of inheritance
- Design and develop programs using packages and interfaces.
- Understand the mechanism of exceptional handling and thread synchronization
- Understand the concept of event handling and GUI interface using Java swings.

**Pre-requisite:**

C Programming.

**Syllabus:****UNIT- I**

OOPS BASICS: OO Programming principles & Paradigms, Classes and Objects, Design Strategies in OOP (Coupling and Cohesion), defining state and behavior of a class.

JAVA BASICS: History, Features of java , Data types, variables, scope and life time of variables, operators, arrays, expressions, control statements, type conversions rules (type casting), methods and recursion, sample program.

**UNIT -II**

JAVA ANATOMY: Java Objects and References, Constructors, this keyword, garbage collection, String Buffer , String Tokenizer.

INHERITANCE: Introduction, Derived Classes, Advantages of Inheritance, Types of Inheritance, Member Accessibility. keyword Super, Abstract classes and Methods, the Final Classes and Final Methods, Dynamic Binding.

**UNIT- III**

PACKAGES: Defining, Creating and Accessing a Package, Understanding CLASSPATH, Importing Packages, Access Controls (Public, Protected, Default, and Private).

INTERFACES: Differences between Classes and Interfaces, Defining An Interface, Implementing Interface, Applying Interfaces, Variables In Interface and Extending Interfaces.

**UNIT- IV**

EXCEPTION HANDLING AND MULTITHREADING: Concepts of Exception Handling, Benefits Of Exception Handling, Exception Hierarchy, Usage Of Try, Catch, Throw, Throws And Finally, Built In Exceptions, Creating Own Exception Sub Classes. Differences between Multi Threading and Multitasking, Thread Life Cycle, Creating Threads

**UNIT -V**

EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, Adapter classes, Inner classes, handling mouse and keyboard events.

SWINGS: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing components Layout manager– border, grid, flow, card and grid bag.

**Text Book:**

1. Java: The complete reference, 7<sup>th</sup> Edition, Herbert Scheldt, TMH.

**Reference Books:**

1. Thinking in Java 4E : Bruce Eckel , Pearson.
2. Core Java(TM) Volume 1: Fundamentals,8<sup>th</sup> Edition Horstmann.
3. The JavaTM Programming Language Ken Arnold, James Gosling, Pearson.
4. Programming with Java, A Primer, 4<sup>th</sup> Edition, E. Balaguruswamy.

**e-Learning Resources:**

1. <http://www.nptelvideos.com/java/>
2. <http://ocw.mit.edu/courses/>

## 3/4 B.Tech - SECOND SEMESTER

IT6L1

OOAD LAB

Credits: 2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To provide knowledge on designing software application using object oriented paradigm.
- To discuss various UML diagrams for a given application.
- To design a system using UML diagrams with respect to various architectural views.

**Outcomes:**

Students will be able to

- Analyze and design structural diagrams.
- Construct UML diagrams to model the behavioral aspects (Use case, Activity, Sequence and Collaboration Diagrams) for a given problem.
- Construct UML diagrams to model the dynamic behavior of system.
- Design the architectural aspects of a system.

**Exercises:**

Case Study 1: Banking Application.

Case Study 2: Business Application.

Case Study 3: Implementing a Web Based Auction System using UML and Component-Based Programming

1. Identification of analysis classes, Identification of responsibilities of each class,
2. Identification of attributes of each class, Identification of relationships of classes.
3. Construction of UML static class diagram.
4. Construction of sequence diagram.
5. Construction of collaboration diagram.
6. Identification of actors, identification of use cases, flow of events, construction of use case diagram.
7. Building a business process model using UML activity diagram.
8. Analyzing the object behavior by constructing the UML state chart diagram.
9. Model the component diagrams.
10. Model the deployment diagrams.

**Reference Book:**

1. Rob Pandey, Pauline Wilcox Applying UML Advanced Application, Elsevier.

**e- Learning Resources**

1. <http://nptel.ac.in/courses/122105022/27A>
2. [http://www.csm.ornl.gov/~sheldon/public/sheldonf\\_auction.pdf](http://www.csm.ornl.gov/~sheldon/public/sheldonf_auction.pdf)

## 3/4 B.Tech - SECOND SEMESTER

IT6L2

DM LAB

Credits: 2

Lab: 3 Periods/week

Internal assessment: 25 marks

Semester end examination: 50 marks

**Objectives:**

- To perform data preprocessing operations.
- To implement various Data Mining techniques to understand Data Mining processes.
- To gain familiarity with various stages of KDD for an application.
- To provide Hands on experience on data mining tools.

**Outcomes:**

Students will be able to

- Perform various operations on data preprocessing.
- Implement association rule mining algorithms.
- Apply different classification techniques.
- Analyze data using clustering techniques.

**Exercises:**

1. Perform data preprocessing using data mining tool.
2. Perform discretization of data using data mining tool.
3. Apply association rule process on a sample data set using Apriori algorithm.
4. Apply association rule process on a sample data set using FP Growth algorithm.
5. Apply the classification tool process on data set using any decision tree algorithm.
  - a) Naive Bayes
  - b) Linear Regression
  - c) JRip
  - d) ZeroR
  - e) id3
  - f) J48
6. Apply Clustering process to a sample data set using k-means.
7. Apply Clustering process to a sample data set using k-medoids.
8. A small case study involving all stages of KDD. (Datasets are available online like UCI Repository etc.)

**Reference Book:**

1. Data Mining for the Masses by Dr.Mathewworth.

**E-Learning Resources:**

1. [www.cs.waikato-ac.wz/ml/weka](http://www.cs.waikato-ac.wz/ml/weka)
2. <http://rapid-i.com>

## 3/4 B.Tech - SECOND SEMESTER

IT6L3

COMPUTER GRAPHICS AND ALGORITHMS LAB

Credits:2

Internal assessment: 25 marks

Lab: 3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To introduce the basics of output primitives through OpenGL.
- To design different types of transformations in graphics.
- To gain familiarity with different types of clipping and polygon algorithms.

**Outcomes:**

Students will be able to

- Implement different types of interactive graphics programs using OpenGL.
- Develop various transformations in graphics.
- Build an interactive graphics program to perform various clipping algorithms.
- Implement an interactive graphics program to perform polygon filling.

**Prerequisites:**

Classic Data Structures, Engineering Mathematics-I and Engineering Mathematics-II

**Exercises:**

1. Write a program to draw points on plane in OpenGL.
2. Write a program to draw a line on plane in OpenGL.
3. Write a program to draw circle on plane in OpenGL.
4. Write a program draw a white rectangle on a black background in OpenGL.
5. Write a program to draw a color cube and spin it using OpenGL transformation matrices.
6. Write a program to create a house like figure and rotate it about a given fixed point using OpenGL functions.
7. Write a program to implement the Cohen-Sutherland line clipping algorithm. Make provision to specify the input line, window for clipping and viewport for displaying the clipped image in OpenGL.
8. Write a program to fill any given polygon using scanline area filling algorithm in OpenGL.
9. Program to display a set of values  $\{f_{ij}\}$  as a rectangular mesh. Rectangular Mesh using set of points  $f(i,j)=f(x_i,y_j)$  where  $x_i=x_0+i*dx$ ,  $y_j=y_0+j*dy$ .

**Reference Books:**

1. "Computer Graphics through OpenGL", SumanthaGuha, Chapman and Hall/CRC 2011.
2. "OpenGL graphics through applications", Robert Whitrow, Springer 2008.

**e-Learning Resources:**

1. <http://web.cs.wpi.edu/~emmanuel/courses/cs4731/GettingStartedOpenGL.html>
2. <http://www.sumantaguha.com/downloads>
3. <https://www.opengl.org/documentation/books/>



## 3/4 B.Tech - SECOND SEMESTER

IT6L4

## PERSONALITY DEVELOPMENT COURSE

Credits:1

Lab: 2 Periods/week

Internal assessment: 50 marks

**Objectives:**

- To introduce fundamentals of various aspects of personality traits.
- To give them adequate exposure to the basic aspects which mould the personality
- To enable them to develop humble nature.
- To create in them the love for human values.

**Outcomes:**

Students will be able to

- Improve Leadership skills.
- Acquire Non verbal skills.
- Develop Team culture.
- Improve Managerial qualities and communication skills.
- Refine the Body Language.

**Syllabus:****UNIT-I**

## PERSONALITY:

1. Grooming one's personality
2. Influence of heredity and environment on personality
3. Different personality types.

**UNIT-II**

## PERSONALITY DEVELOPMENT

1. Freudian Analysis
2. Vivekananda concept

**UNIT-III**

## LEADERSHIP QUALITIES

1. Communication skills
2. Attitude
3. Empathy
4. Adaptability
5. Conflict Resolution

**UNIT-IV**

## SOFT SKILLS IN WORKPLACE

1. Time management
2. Planning & organization
3. Parkinson's law
- 5 Team work
6. Assertiveness

**UNIT-V****BODY LANGUAGE**

1. Aggressiveness
2. Submissiveness
3. Attentiveness
4. Nervousness
5. Defensiveness
6. Handshake

**Text Book:**

1. Personality development & soft skills Barun K. Mith Oxford

**Reference Books:**

1. Personal & emotional competence, V. Bhaskara Rao, B.S.P
2. Step by step – Niruparani.K, Jayasree Mohanra, Pearson

## 3/4 B.Tech - SECOND SEMESTER

**IT6L5****SEMINAR****Credits: 1****Lab: 2 Periods/week****Internal assessment: 50 marks**

Student should prepare and submit a report on a new topic and give seminar relevant to the programme.

**Objectives:**

- To get acquainted with the recent technologies.
- To learn about presentation and communication skills.

**Outcomes:**

Students will be able to

- Adopt good oral and presentation skills.
- Compile effective power point presentations and report writing.
- Develop better body language.
- Improve knowledge on recent advancements and technologies in IT and ITES.

## 4/4 B.Tech - FIRST SEMESTER

**IT7T1          MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY          Credits:3**  
**Lecture: 3 Periods/week          Internal assessment: 30 marks**  
**Practice/Interaction: 1Period/week          Semester end examination: 70 marks**

**Objectives:**

- To master the basic tools of microeconomics: supply and demand analysis; firms' production and pricing decisions, market equilibrium and market structure analysis.
- To enable the students to know different forms of businesses and their characteristics, limitations and advantages.
- To enable the students to analyze a company's financial statements preparation and come to a reasoned conclusion about the financial situation of the company.
- To introduce prospective managers of new ventures to prepare and analyse financial statements.
- To enable the students understand how organizations make important investment and financing decisions

**Outcomes:**

Students will be able to

- Aware of various aspects of managerial economics, production & cost analysis, markets & pricing strategies.
- Develop an ability to identify, formulate, and solve engineering problems by applying the subject knowledge of Managerial economics.
- Apply capital budgeting, financial analysis techniques in evaluating various investment opportunities
- Enhance their capabilities in the interpretation of balance sheets are followed in industries, organizations & institutes.

**Syllabus:****Unit -I**

Introduction to Managerial Economics & Demand Analysis: Definition of Managerial Economics, Characteristics and Scope – Demand Analysis: Meaning- Demand distinctions- Demand determinants- Law of Demand and its exceptions. Elasticity of Demand & Demand Forecasting: Definition -Types of Elasticity of demand - Measurement of price elasticity of demand. Demand Forecasting: Meaning - Factors governing demand forecasting - Methods of demand forecasting - Criteria of a good forecasting method.

**Unit-II**

Theory of Production and Cost Analysis: Production Function- Isoquants and Isocosts, MRTS, Law of variable proportions- Law of returns to scale- Least Cost Combination of Inputs, Cobb-Douglas Production function - Economies of Scale. Introduction to Markets, Managerial Theories of the Firm & Pricing Policies: Market structures: Types of competition, Features of Perfect Competition, Monopoly and Monopolistic Competition.

**Unit -III**

Types of Industrial Organization, Introduction to business cycles: BEP Analysis, Characteristic features of Industrial organization, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, State/Public Enterprises and their types. Introduction to Break-Even Point (simple problems) - Managerial Significance and limitations of BEP.

**Unit -IV**

Introduction to Financial Accounting: Introduction to Double-entry system, Journal, Ledger, Trial Balance- Final Accounts (with simple adjustments) - Limitations of Financial Statements. Interpretation and analysis of Financial Statement: Ratio Analysis – Liquidity ratios, Profitability ratios and solvency ratios.

**Unit -V**

Capital and Capital Budgeting: Meaning of capital budgeting, Need for capital budgeting – Capital budgeting decisions (Examples of capital budgeting) - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), IRR and Net Present Value Method (simple problems)

**Text Books:**

1. A R Aryasri - Managerial Economics and Financial Analysis, TMH 2011
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, 2011.

**Reference Books:**

1. N. Appa Rao. & P. Vijaya Kumar - Managerial Economics and Financial Analysis, Cengage Publications, New Delhi, 2011
2. J.V.Prabhakar Rao - Managerial Economics and Financial Analysis, Maruthi Publications, 2011
3. Suma damodaran- Managerial Economics, Oxford 2011

## 4/4 B.Tech - FIRST SEMESTER

**IT7T2****SOFTWARE TESTING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

To provide a thorough understanding of

- The need for testing, types of bugs and their consequences.
- Path testing, system testing and Domain testing and its applications.
- Paths of various flow graphs, their interpretations and applications.
- Logic based testing and its implementation.
- State graphs and transition testing, matrix of a graph and node reduction algorithms.

**Outcomes:**

Students will be able to

- Understand the importance of testing and debugging.
- Interpret a model for testing and understand the process of testing and its limitations.
- Understand the path testing, transaction flow and data flow in a software system and selection criteria and their limitations.
- Understand the domain testing strategy for different dimension domains and concept of Logic based testing.
- Apply KV Charts, State Graphs, Transition testing and Graph Matrices.

**Prerequisite:**

Software Engineering

**Syllabus:****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, predicates, path predicates, achievable paths, path sensitizing, path instrumentation, application of path testing.

Transaction Flow Testing: Transaction flows, transaction flow testing techniques.

Dataflow testing: basics, strategies in dataflow testing, application of dataflow testing.

**UNIT-III**

Domain Testing: domains and paths, Nice &amp; ugly domains, domain testing, domain and interface testing, domains and testability.

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

**UNIT-IV**

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

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

**UNIT-V**

Graph Matrices and Application : Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

**Text Book:**

1. Software Testing Techniques - Boris Beizer, Dreamtech, 2<sup>nd</sup> Edition.

**Reference Books:**

1. Software Testing Techniques–SPD (Oreille).
2. Software Testing in the Real World–Edward Kit, Pearson.
3. Effective methods of Software Testing, Perry, John Wiley.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/106101061/18>
2. <http://nptel.ac.in/courses/106101061/19>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T3****MOBILE COMPUTING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To demonstrate the various architecture and applications of Mobile Communication.
- To provide basic knowledge on GSM architecture and CDMA.
- To gain the knowledge on network and transport layers in mobile computing architecture.
- To provide Basic knowledge on MANET's and WLAN.

**Outcomes:**

Students will be able to

- Understand the architecture of mobile computing and GSM system.
- Understand the services provided by various layers in mobile computing architecture.
- Analyze the concepts of synchronization in mobile computing systems.
- Describe the MANET architecture, applications and properties.
- Know the concepts of Mobile internet using WLAN.

**Prerequisite:**

Data Communication and Computer Networks.

**Syllabus:****UNIT-I**

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

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

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

**UNIT - II**

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

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

**UNIT - III**

Synchronization: Synchronization in mobile computing systems, Usage models for Synchronization in mobile application, Domain-dependent specific rules for data synchronization, Mobile Agent.



**UNIT - IV**

Mobile Ad hoc Networks (MANETs): Fixed infrastructure architecture and MANET Infrastructure architecture, Properties of a MANET, Spectrum, Applications, Security in Ad-hoc networks, Wireless Sensor Networks.

**UNIT - V**

Mobile Wireless Short Range Networks and Mobile Internet: Wireless networking and wireless LAN, Wireless LAN Architecture, IEEE 802.11 Protocol Layer, Wireless Application Protocol WAP 1.1 Architecture, Wireless Datagram Protocol (WDP), Wireless Transport Layer Security (WTLS), Wireless Transaction and Session Layers, Wireless Application Environment. Case Study on Mobile Operating Systems.

**Text Books:**

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, second edition,
2. RAJ KAMAL "Mobile Computing", Second edition Oxford publication.

**Reference Books:**

1. RezaBehravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
2. ASOKE K TALUKDE, HASAN AHMED, OOPA YAVAGAI."Mobile computing, Technology Application and service Creation", 2<sup>nd</sup> Edition, McGraw Hill.

**e-Learning Resources**

1. <https://www.youtube.com/watch?v=LZuzO0FKd0A> (IIT Madras)
2. <https://www.youtube.com/watch?v=5eS78dE2z6Y> (NPTEL)
3. <https://www.youtube.com/watch?v=EDDEsX7vall> (NPTEL)
4. <https://www.youtube.com/watch?v=QHDxbbc1GWs> (NPTEL)

## 4/4 B.Tech - FIRST SEMESTER

**IT7T4****DISTRIBUTED OBJECT TECHNOLOGIES****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To understand explain the creation of response generated by the server.
- To explain the server side scripting concepts in the creation of web applications.
- To explain the basic operations on databases which improves the dynamic nature of the web pages.
- To enhance the creation of server objects for accepting requests and response.

**Outcomes:**

Students will be able to

- Understand the basic operations on data.
- Implement conditional, control statements and functions.
- Perform operations on arrays and files.
- Understand and perform database operations.
- Understand the concepts of AJAX with XML and database.

**Prerequisite:**

Java, Web Technologies.

**Syllabus:****UNIT -I**

PHP Programming: Introducing PHP: Creating PHP script, Running PHP script.

Working with Variables and constants: Using variables, Using constants, Data types, Operators: Arithmetic, Assignment, Comparison, Increment &amp;Decrement Operators, Logical, String, Array.

**UNIT -II**

Controlling program flow: PHP Strings: length, count, search, replace, reverse, Conditional statements: if, if-else, switch, Control statements: for, while, Arrays: Indexed, Associative, Multidimensional, Sorting, Functions: user defined functions, function arguments, default argument.

**UNIT- III**

PHP Arrays: PHP two dimensional Array, PHP date and time, include,

File Operations: file Handling, file Open/Read, file Create/Write, file Upload, Php Error Handling, Exceptions.

**UNIT- IV**

Mysql Database: connect, create database, table, insert, select, delete, update Forms and Database using MySql, Cookies, Sessions, Form Validation, Php super global variables.

**UNIT -V**

AJAX: Introduction, AJAX with XML and PHP, AJAX Database.

**Text Books:**

1. "PHP for the web", 4<sup>th</sup> Edition, Larry Ullman.
2. "PHP for absolute Beginners", Jason Lengstorf, published by Apress publications

**Reference Books:**

1. "Head First PHP and MYSQL", 2<sup>nd</sup> Edition, Lynn Beighley.
2. "PHP Object Oriented Solutions", David Powers.

**e- Learning Resources:**

1. <http://thephpbasics.com/>
2. <http://www.w3schools.com/php/>
3. <http://freevidelectures.com/Course/3165/PHP-Programming#>
4. <http://www.developphp.com/video/PHP>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T5A****NETWORK PROGRAMMING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To describe the TCP/IP protocol suite in UNIX environment.
- To introduce Berkley sockets and system calls in network programming.
- To demonstrate the socket API and IPC mechanisms.

**Outcomes:**

Students will be able to

- Understand the basics of network protocols and socket structures.
- Develop robust client-server applications using elementary TCP system calls.
- Understand the need of Multiplexing.
- Develop client server applications using elementary UDP socket system calls and understand the address translation in network environment.
- Understand the use of different IPC mechanisms.

**Prerequisites:**

Data Communication and Computer Networks, C programming and UNIX.

**Syllabus:****UNIT-I**

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitations

Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions.

**UNIT-II**

Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers, close function

TCP client server: Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and rebooting of server host shutdown of server host.

**UNIT -III**

I/O Multiplexing: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions.

**UNIT-IV**

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

Elementary name and Address conversions: DNS, get host by name function, resolver options and IPV6 support, uname function.

**UNIT-V**

IPC : Introduction, IPC between processes on single computer system, IPC between process on different systems, File and record locking, Pipes, FIFO, Name spaces, Message queues, Semaphores and Shared Memory, Remote Procedure Call.

**Text Books:**

1. UNIX Network Programming, Vol. I, Sockets API, 2<sup>nd</sup> Edition. - W.Richard Stevens, Pearson Edn. Asia.
2. UNIX Network Programming, Interprocess Communication, 2<sup>nd</sup> Edition, W.Richard Stevens. PHI.

**Reference Books:**

1. UNIX for programmers and Users, 3<sup>rd</sup> Edition, Graham Glass, King Ables, Pearson Education.
2. Advanced UNIX programming, 2<sup>nd</sup> Edition, M J Rochkind, Pearson Education
3. Advanced UNIX Programming, NB Venkateswarlu, BS Publications, 2<sup>nd</sup> Edition

## 4/4 B.Tech - FIRST SEMESTER

**IT7T5B****CLOUD COMPUTING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide knowledge on Cloud Computing concepts, technologies and architecture.
- To introduce the concepts of Cloud Computing fundamentals, applications and implementations.
- To identify various areas of information systems in managing the cloud environment.

**Outcomes:**

Students will be able to

- Understand the architecture and infrastructure of cloud computing.
- Identify services of cloud computing like SaaS ,PaaS ,IaaS.
- Explain the core issues in virtual machine provisioning for cloud infrastructure.
- Identify, Explain and analyze the concepts of Map reducing in cloud environment.
- Understand the concepts of managing the cloud.

**Syllabus:****UNIT -I**

Introduction to cloud computing- Cloud computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks.

**UNIT -II**

Enriching the 'Integration as a Service' Paradigm for the Cloud Era--The Onset of Knowledge Era, The Evolution of SaaS, The Challenges of SaaS Paradigm, SaaS Integration Services and products, SaaS Integration Appliances. The Enterprise Cloud Computing Paradigm - Background, Enterprise Cloud Technology and Market Evolution.

**UNIT -III**

INFRASTRUCTURE AS A SERVICE (IAAS):Virtual Machines Provisioning and Migration Services- Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services ,VM Provisioning and Migration in Action, Provisioning in the Cloud Context. On the Management of Virtual Machines for Cloud Infrastructures- The Anatomy of Cloud Infrastructures, Distributed Management of Virtual Infrastructures.

**UNIT- IV**

Understanding Scientific Applications for Cloud Environments: A Classification of Scientific Applications and Services in the Cloud , SAGA-based Scientific Applications that Utilize Clouds. The MapReduce Programming Model and Implementations: MapReduce Programming Model, Major MapReduce Implementations for the Cloud, MapReduce Impacts and Research Directions.

**UNIT- V**

Managing the Cloud: Administrating the cloud, Management Responsibilities, life cycle management, cloud management products, Standards. Cloud Security: Securing the cloud, boundary, mapping, -brokered cloud storage access, storage location and tenancy, Encryption. Introducing service oriented architecture.

**Text Books:**

1. Rajkumar Buyya ,James Broberg, Andrzej Goscinski, CLOUD COMPUTING Principles and Paradigms , Wiley Publishing inc.
2. Barrie Sosinsky Cloud Computing Bible, Wiley Publishing inc.

**Reference Books:**

1. Michael Miller, Cloud Computing Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Judith Hurwitz , Robin Bloor , Marcia Kaufman ,Fern Halper Cloud Computing for Dummies. Wiley publishing inc.
3. Cloud Application Architecture- George Reese.
4. Haley Beard Cloud computing best practices

**e-Learning Resources:**

1. <http://www.slideshare.net/himanshuawasthi2109/cloud-computing-ppt-16240131>
2. <http://nptel.ac.in/courses/106105033/41>
3. [https://www.youtube.com/watch?v=r8Lu\\_BjxIZc](https://www.youtube.com/watch?v=r8Lu_BjxIZc)
4. <http://video.mit.edu/watch/mitef-nyc-cloud-computing-8347/>

## 4/4 B.Tech - FIRST SEMESTER

<b>IT7T5C</b>	<b>ELEMENTS OF SOFTWARE PROJECT MANAGEMENT</b>	<b>Credits:3</b>
<b>Lecture: 3 Periods/week</b>		<b>Internal assessment: 30 marks</b>
<b>Practice/Interaction: 1Period/week</b>		<b>Semester end examination: 70 marks</b>

**Objectives:**

- To introduce the basic building blocks of software project management.
- To demonstrate principles of modern software project management and life cycle phases.
- To discuss different milestones in software project management.
- To give an idea on next generation software economics.

**Outcomes:**

Students will be able to

- Understand the concepts of conventional software management and software economics.
- Gain the knowledge on software development lifecycle and artifacts.
- Understand the process workflows and milestones.
- Analyze the concepts of work break down structure, cost estimation and process automation.
- Understand the importance of software metrics and quality indicators.

**Prerequisite:**

Software Engineering

**Syllabus:****UNIT - I**

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

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

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

**UNIT - II**

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

Life cycle phases: Engineering and production stages, inception, elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, Programmatic artifacts.

**UNIT - III**

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

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

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



**UNIT-IV**

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

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

Process Automation: Automation Building blocks, The Project Environment.

**UNIT - V**

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

Future Software Project Management: Next generation Software economics.

**Text Book:**

1. Software Project Management, Walker Royce Pearson Education, 2009.

**Reference Books:**

1. Software Project Management, Bob Hughes and Mike Cotterell Tata McGraw- Hill Edition.
2. Software Project Management in Practice, Pankajjalot, Pearson Education
3. Software Project Management, Joel Henry, Pearson Education.
4. Software Project Management, Sanjay Mohopatra
5. Software Project Management, A Concise Study, S.A.Kelkar

**e-Learning Resources:**

1. <http://www.qaielearning.com/training/software-project-management>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T5D****SECURE SOFTWARE ENGINEERING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce the fundamental concepts and properties in security.
- To know various security process models.
- To explain the software security practices.
- To introduce Software Security Knowledge for Architecture and design concepts of Software Security Testing.

**Outcomes:**

Students will be able to

- Understand security concepts.
- Understand the properties of secure software.
- Analyze various security process models.
- Gain Knowledge on Requirements Elicitation, prioritization and risk management.
- Understand the concepts of software security principles and testing

**Prerequisite:**

Software Engineering

**Syllabus:****UNIT -I**

The Problem, System Complexity The Context within Which Software Lives. Software Assurance and Software Security. The Role of Processes and Practices in Software Security. Threats to Software Security .Sources of Software Insecurity. The Benefits of Detecting Software Security Defects Early: Making the Business Case for Software Security Current State.

**UNIT -II**

Introduction, Defining Properties of Secure Software: Core Properties of Secure Software. Influential Properties of Secure Software. How to Influence the Security Properties of Software: The Defensive Perspective. The Attacker's Perspective. How to Assert and Specify Desired Security Properties: Building a Security Assurance Case.

**UNIT -III**

Introduction: The Importance of Requirements Engineering, Quality Requirements, Security Requirements Engineering. Misuse and Abuse Cases: Security Is Not a Set of Features, Thinking About What You Can't Do, Creating Useful Misuse Cases, An Abuse Case Example. The SQUARE Process Model: A Brief Description of SQUARE, Tools, Expected results. SQUARE Sample Outputs: Output from SQUARE Steps, SQUARE Final Results.

**UNIT- IV**

Requirements Elicitation: Overview of Several Elicitation Methods, Elicitation Evaluation Criteria.  
Requirements Prioritization: Identify Candidate Prioritization Methods, Prioritization Technique Comparison, and Recommendations for Requirements Prioritization.  
Software Security Practices for Architecture and Design Architectural Risk Analysis: Characterization, Threat. Assessment, Determination, Risk. Risk Mitigation Planning. Recapping Architectural Risk Analysis.

**UNIT -V**

Software Security Knowledge for Architecture and Design Security Principles, Security Guidelines, and Attack Patterns: Security Principles, Security Guidelines, Attack Patterns.  
Software Security Testing: Contrasting Software Testing and Software Security Testing, Functional Testing, Risk-Based Testing.

**Text Book:**

1. Software Security Engineering A Guide for Project Managers by Julia H.Allen, ean J. Barnum, Robert J. Ellison and Gary McGraw, May 11, 2008

**Reference Book:**

1. John Musa D, "Software Reliability Engineering", 2nd Edition, Tata McGraw-Hill, 2005

**e-Learning Resources:**

1. [http://study.com/articles/List\\_of\\_Free\\_Online\\_Software\\_Engineering\\_Courses.html](http://study.com/articles/List_of_Free_Online_Software_Engineering_Courses.html)
2. <https://www.coursera.org/course/softwaresec>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T5E****E-COMMERCE TECHNOLOGY****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide scope of e-commerce in the realm of modern business.
- To acquire knowledge on technologies used to develop and deliver E-commerce applications.
- To provide knowledge on Different electronic payment modes.
- To get familiar with marketing methods used in e-commerce

**Outcomes:**

Students will be able to

- Understand the Framework of E-commerce and different types of E-commerce applications.
- Gain Knowledge on different types of Electronic payment systems.
- Understand Intra and Inter Organizational commerce.
- Know the concepts of advertising and marketing through Internet
- Understand the consumer search and resource discovery through E-commerce Techniques.

**Syllabus:****Unit-I**

Electronic Commerce-Framework, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications ,  
Consumer Oriented Electronic commerce-Mercantile Process Models

**Unit-II**

Electronic payment systems-Digital Token-based, Smart cards, Credit cards, Risks in Electronic payment systems

**Unit-III**

Inter Organizational Commerce-EDI, EDI Implementation, Value added networks  
Intra Organizational Commerce-Supply Chain Management

**Unit-IV**

Advertising and marketing-Information based marketing, Advertising on Internet, Online marketing process, Market Research.

**Unit-V**

Consumer search and Resource Discovery-Information search and retrieval ,Commerce catalogues, Information filtering. A case study on www.amazon.com.

**Text Book:**

1. Frontiers of Electronic Commerce - Ravi Kalakota, Whinston, Pearson.

**Reference Books:**

1. E-commerce Fundamentals and Applications Hendry Chan Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley
2. E-commerce, S.Jaiswal-Galgotia

**e- Learning Resources:**

1. [http://nptel.ac.in/courses/106108103/pdf/Lecture\\_Notes/LNm13.pdf](http://nptel.ac.in/courses/106108103/pdf/Lecture_Notes/LNm13.pdf)
2. <http://textofvideo.nptel.iitm.ac.in/106105084/lec35.pdf>
3. <http://www.ddegjust.ac.in/studymaterial/mcom/mc-201.pdf>
4. <http://orfe.princeton.edu/courses/orf401/#Lectures>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T6A****HUMAN COMPUTER INTERACTION****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide awareness on interface design methods and characteristics of GUI.
- To explain different considerations in design process.
- To know the various issues in screen design.
- To discuss about the GUI components design.

**Outcomes:**

Students will be able to

- Understand the GUI design and its characteristics.
- Analyze human physical and mental limitations to use computers and provide solutions.
- Understand the techniques of presentation of screen design components.
- Gain knowledge on the concepts of windows.
- Understand the selection of various screen design components.

**Syllabus:****UNIT -I**

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

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 -II**

Design process: Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business functions.

**UNIT -III**

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 -IV**

Windows: Develop System Menus and Navigation schemes selection of window, selection of devices based and screen based controls.

**UNIT- V**

Components: Clear text and messages, Icons, Multimedia, colors, users problems, choosing colors.

**Text Book:**

1. The Essential Guide to User Interface Design, 2<sup>nd</sup> Edition, Wilbert O Galitz, Wiley DreamTech.

**Reference Books:**

1. Human Computer Interaction, Dan R.Olsan, Cengage, 2010.
2. Designing the user interface. 4<sup>th</sup> Edition, Ben Shneidermann, PEA.
3. Human Computer Interaction. 3<sup>rd</sup> Edition, Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, PEA, 2004.

**e-Learning Resources:**

1. <http://iiscs.wssu.edu/drupal/node/4607>
2. [https://www.interaction-design.org/encyclopedia/human\\_computer\\_interaction\\_hci.html](https://www.interaction-design.org/encyclopedia/human_computer_interaction_hci.html)

## 4/4 B.Tech - FIRST SEMESTER

**IT7T6B****SERVICE ORIENTED ARCHITECTURE****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To understand implementation model for SOA and its Principles and Benefits.
- To Understand XML concepts, paradigms needed for testing web services.
- To explore different Test Strategies for SOA-based applications.
- To implement functional testing, compliance testing and load testing of Web Services.
- To identify bug-finding ideas in testing Web Services.

**Outcomes:**

Students will be able to

- Understand the importance of Web Services and Service oriented Architecture.
- Explore the knowledge on WSDL and Web Service Architecture.
- Explore the knowledge on SOAP.
- Understand the concepts of UDDI.
- Understand Web Service Security and categorize different frame works.

**Prerequisite:**

Web Technologies

**Syllabus:****UNIT -I**

Evolution and Emergence of Web Services – Evolution of distributed computing. Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA). 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 -II**

Web Service 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. Describing Web Services – introduction, non functional service description, WSDL1.1 Vs WSDL 2.0, WSDL document, WSDL elements, WSDL binding, WSDL tools, WSDL port type, limitations of WSDL.

**UNIT -III**

Brief Overview of XML. SOAP : Simple Object Access Protocol, Inter-application communication and wire protocols, SOAP as a messaging protocol, Structure of a SOAP message, SOAP envelope, Encoding, Service Oriented Architectures, SOA revisited, Service roles in a SOA, Reliable messaging, The enterprise Service Bus, SOA Development Lifecycle, SOAP HTTP binding, SOAP communication model, Error handling in SOAP.

**UNIT- IV**

Registering and Discovering Services : The role of service registries, Service discovery, Universal Description, Discovery, and Integration, UDDI Architecture, UDDI Data Model, Interfaces, UDDI Implementation, UDDI with WSDL, UDDI specification, Service Addressing and Notification, Referencing and addressing Web Services, Web Services Notification.

**UNIT -V**

SOA and web services security considerations, Network-level security mechanisms, Application-level security topologies, XML security standards, Enterprise management Framework, Standard distributed management frameworks, Web service management, Richer schema languages, WS-Metadata Exchange.

**Text Books:**

1. Web Services & SOA Principles and Technology, 2<sup>nd</sup> Edition, Michael P. Papazoglou.
2. Developing J2EE Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

**Reference Books:**

1. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
2. Building web Services with Java, 2<sup>nd</sup> Edition, S. Graham and others, Pearson Education.
3. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly, SPD.
4. McGovern, et al., "Java web Services Architecture", Morgan Kaufmann Publishers, 2005.
5. J2EE Web Services, Richard Monson-Haefel, Pearson Education.

**e- Learning Resources:**

1. [http://www.nmeict.iitb.ac.in/nmeict/avproduction/rtmpstream/stream.php?cs\\_id=2](http://www.nmeict.iitb.ac.in/nmeict/avproduction/rtmpstream/stream.php?cs_id=2)
2. [https://www.youtube.com/watch?v=sOvD\\_VLr7Z0](https://www.youtube.com/watch?v=sOvD_VLr7Z0)
3. <https://www.youtube.com/watch?v=nRayJZmj2oY>



## 4/4 B.Tech - FIRST SEMESTER

**IT7T6C****SOFTWARE DESIGN PATTERNS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce the fundamental concepts of design patterns.
- To explain principles, practices and approaches to make good designs using design patterns.
- To provide knowledge on various design patterns such as composite, iterator, observer, factory method and strategy

**Outcomes:**

Students will be able to

- Understand the basic components of design pattern.
- Understand the role of design patterns to design document editor.
- Gain knowledge on creational patterns.
- Gain knowledge on structural patterns.
- Understand the implementation of behavioral patterns in various situations.

**Prerequisites:**

Software Engineering, OOAD.

**Syllabus:****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 Patterns: Adapter, Bridge, and Composite, Decorator, Façade, Flyweight, Proxy.

**UNIT-V**

Behavioral Patterns : Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns, What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

**Case study: Document Editor****Text Book:**

1. Design Patterns, Erich Gamma, Pearson Education.

**Reference Books:**

1. Pattern's in JAVA Vol-I By Mark Grand , WileyDreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand , WileyDreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,WileyDreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd.
5. Design Patterns Explained By Alan Shalloway, Pearson Education.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/106101061/15>

## 4/4 B.Tech - FIRST SEMESTER

**IT7T6D****IMAGE PROCESSING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce basic principles of digital image processing.
- To provide knowledge on Image data structures
- To demonstrate different image encoding techniques.
- To explain segmentation and restoration techniques.

**Outcomes:**

Students will be able to

- Understand the fundamentals of digital image processing.
- Understand and apply image enhancement and restoration techniques.
- Understand different types of color image processing techniques and its operations.
- Analyze and implement various image encoding techniques.
- Understand different types of segmentation techniques.

**Prerequisite:**

C Programming

**Syllabus:****UNIT-I**

Introduction: Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels

**UNIT-II**

Image enhancement in the spatial domain: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods

**UNIT-III**

Color Image Processing: Color fundamentals, color models, pseudo color image processing, basics of full-color image processing, color transforms, smoothing and sharpening, color segmentation

**UNIT-IV**

Image Compression: Fundamentals, image compression models, error-free compression, lossy predictive coding, image compression standards.

**UNIT-V**

Image Segmentation: Detection of discontinuous, edge linking and boundary detection, thresholding, region-based segmentation

Morphological Image Processing: Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms

**Text Book:**

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

**Reference Books:**

1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Digital Image Processing and Analysis, B. Chanda, D. DattaMajumder, Prentice Hall of India, 2003
4. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
5. Digital Image Processing using Matlab, Rafeal C. Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/117105079/29>

## 4/4 B.Tech - FIRST SEMESTER

IT7T6E

CRYPTOGRAPHY AND NETWORK SECURITY

Credits:3

Lecture: 3 Periods/week

Internal assessment: 30 marks

Practice/Interaction: 1Period/week

Semester end examination: 70 marks

**Objectives:**

- To discuss the tradeoffs inherent in security.
- To explain the issues in creating security policy for a large organization.
- To defend the need for protection and security, and the role of ethical considerations.
- To discuss the fundamental ideas of public-key cryptography and simple extensions of cryptographic protocols.

**Outcomes:**

Students will be able to

- Get idea on security aspects and classical encryption techniques.
- Apply encryption and decryption techniques.
- Understand the key exchange and key generation mechanisms.
- Understand the hash functions and authentication mechanisms.
- Understand the concepts of email and network security.

**Prerequisites:**

Discrete Mathematics, Data Communication and Computer Networks.

**Syllabus:****UNIT-I**

INTRODUCTION: The OSI security architecture, security attacks, security services, security mechanisms, a model for network security.

CLASSICAL ENCRYPTION TECHNIQUES: Symmetric cipher model, Substitution techniques, Transposition techniques, stream and block cipher, steganography.

**UNIT-II**

BLOCK CIPHERS AND THE DATA ENCRYPTION STANDARD: Block cipher principles, Data Encryption Standard: Strength of DES, Avalanche effect, AES Algorithm, Modern symmetric key ciphers

**UNIT-III**

NUMBER THEORY: Fermats and Euler's theorems, Chinese remainder theorem, RSA algorithm, Diffie-hellman key exchange, Introduction to elliptic curve cryptography, Elliptic curves-Real numbers,  $GF(P)$ ,  $GF(2^n)$ .

**UNIT-IV**

AUTHENTICATION APPLICATIONS: Message Integrity, Message Authentication, HMAC, SHA-512, Digital Signature Schemes, X.509 Directory Service, Symmetric Key Management and Distribution, Kerberos, Symmetric key Agreement.

**UNIT-V****ELECTRONIC MAIL SECURITY**

Network Security: E-mail, PGP, S/SIME.

System Security: Worms, Viruses, Intrusion Detection System.

**Text Books:**

1. Cryptography and Network Security, 2<sup>nd</sup> Edition, Behrouz A. Forouzan, Debdeep Mukhopadhyay
2. Cryptography and Network Security, William Stallings, 4<sup>th</sup> Edition, Pearson Education.

**Reference Books:**

1. Cryptography & Network Security, Behrouz A. Forouzen, TMH.
2. NETWORK SECURITY, Kaufman, Perlman, Speciner, 2<sup>nd</sup> Edition, PHI/Eastern Economy Edition
3. Introduction to Cryptography with Coding Theory, Trappe&Washington, 2<sup>nd</sup> Edition, Pearson.

**e-Learning Resources:**

1. <http://nptel.ac.in/courses/106105031/>
2. <http://searchsecurity.techtarget.com/Understanding-encryption-and-cryptography-basics>
3. <http://freevideolectures.com/Course/3027/Cryptography-and-Network-Security>

## 4/4 B.Tech - FIRST SEMESTER

IT7L1

MOBILE COMPUTING LAB

Credits: 2

Internal assessment: 25 marks

Lab:3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To develop applications for current and emerging mobile computing devices.
- To install ADT Bundle and SDK to run the mobile application.
- To implement and test the mobile applications.
- To Get knowledge on IDE used to develop various mobile applications

**Outcomes:**

Students will be able to

- Implement the operations perform on data using emulator.
- Develop MIDlet's which are used in mobile applications.
- Describe the components and structure of a mobile development frameworks.
- Develop .apk files(mobile apps) which is installed in android mobiles.

**Exercise 1**

Write a J2ME program to show how to change the font size and colour.

**Exercise 2**

Write a J2ME program which creates the following kind of menu

1. Cut
2. Copy
3. Paste
4. Delete
5. Select all
6. Unselect all

**Exercise 3**

Create a J2ME menu which has the following options (Event Handling)

1. Cut - can be on / off
2. Copy - can be on / off
3. Past - can be on / off
4. Delete - can be on / off
5. Select all - put all 4 options on
6. Unselect all - put all

**Exercise 4**

Create on MIDP application which examine. That a phone number, which a user has entered is in the given format (Input checking).

1. Area code should be one of the following 040,041,050,0400,044.
2. There should 6-8 numbers in telephone number (+ area code).

**Exercise 5**

Write an Android application program that displays Hello world using Terminal.

**Exercise 6**

Write an Android application program that displays Hello world using Eclipse.

**Exercise 7**

Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Eclipse.

**Exercise 8**

Write an Android application program that demonstrates the following

1. Linear Layout
2. Relative Layout
3. Table Layout

**Exercise 9**

Write an Android application program that demonstrates the Grid Layout

**Exercise 10**

Write an Android application program that converts the temperature in Celsius to Fahrenheit.

**Reference Books:**

1. The Complete reference of J2ME, JAMES KEOGH, McGraw Hill
2. Professional Android 2 Application Development, Reto Meier, Wrox Publication.



IT7TL2

DISTRIBUTED OBJECT TECHNOLOGIES LAB

Credits: 2

Internal assessment: 25 marks

Lab:3 Periods/week

Semester end examination: 50 marks

**Objectives:**

- To explain the creation of response according to the requirements.
- To explain the server side scripting in the creation of web applications.
- To discuss the basic operations on databases which improves the dynamic nature of the web pages
- To enhance the creation of objects for accepting requests and response.
- To discuss the operations perform on databases

**Outcomes:**

Students will be able to

- Create a pure dynamic webpage like forum.
- Develop a web page and apply effects.
- Perform operations over database like inserting images and submitting data.
- Build authentication on applications by using cookies.
- Create and maintain sessions to the users

**Prerequisites:**

Java, Web Technologies.

**Exercise1:**

- a) Steps for the installation of Wamp Server and run through local host
- b) Write a php program to perform Arithmetic Operations.

**Exercise 2:**

- a)Write a PHP Program to accepts a number from the form and check whether the given number is Armstrong or not.
- b)Write a PHP program to accepts an integer from form and display it reverse order and check whether it is palindrome or not.

**Exercise 3:**

- a) Write a PHP program to insert an image into a database and fetch the image from the database.
- b) Write a PHP program to apply CSS to the Exercise 2(a) & 2(b).

**Exercise 4:**

Write a PHP program to perform user authentication by using static sessions, the login and password values are initialized by using arrays.

**Exercise 5:**

Write a PHP program to perform operations on files

**Exercise 6:**

Write a PHP program to perform CRUD operations on data by using MYSQL.

**Exercise 7:**

Write a PHP program to submit the data into the database and fetch the result and display in the table

**Exercise 8:**

Write a PHP Program to perform user authentication by using cookies and perform the CRUD operations.

**Exercise 9:**

Write a PHP Program to perform user authentication by an user registration and login to maintain sessions and perform the CRUD operations.

**Exercise 10:**

Write a php program to execute join operators in Mysql database

**Exercise 11:**

Write a PHP program to fetch the data and iterate the fetched data through the result set and displayed it in the form of table view

**Exercise 12:**

Write a PHP program which reads the data from XML file and display it in the localhost.

**Text Books:**

1. "PHP for the web", 4<sup>th</sup> Edition, Larry Ullman. Pearson
2. "PHP for absolute Beginners", Jason Lengstorf, Apress.

**Reference Books:**

1. "Head First PHP and MYSQL", 2<sup>nd</sup> Edition, Lynn Beighley. Oreilly Media.
2. "PHP Object Oriented Solutions", David Powers. Pearson

**e-Learning Resources:**

1. <http://thephpbasics.com/>
2. <http://www.w3schools.com/php/>
3. <http://freevideolectures.com/Course/3165/PHP-Programming#>
4. <http://www.developphp.com/video/PHP>

IT7L3

MINI PROJECT/TERM PAPER AND SEMINAR

Credits: 2

Lab: 3 Periods/week

Internal assessment: 75 marks

**Mini Project**

Students need to implement any industry specified task

**Objectives:**

- To develop a product that has passed through the design, analysis, testing, and evaluation stages.
- To develop problem solving, analysis, synthesis and evaluation skills.
- To encourage teamwork and improve student's communication skills.

**Outcomes:**

Students will be able to

- Formulate a real world problem and identify its requirements.
- Express technical ideas, strategies and methodologies in document form.
- Self learn new tools, algorithms and/or techniques that contribute to the solution of the project.
- work as a member and/or leader of a team in project development

**TERM PAPER AND SEMINAR**

Student should prepare and submit a report on a new topic relevant to the programme

**Objectives:**

- To get acquainted with the recent technologies.
- To learn about presentation and communication skills.

**Outcomes:**

Students will be able to

- Adopt good oral and presentation skills.
- Compile effective power point presentations and report writing.
- Develop better body language.
- Improve knowledge on recent advancements and technologies in IT and ITES.

## 4/4 B.Tech - SECOND SEMESTER

**IT8T1****BIOMETRICS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To explain Biometric Matching, Accuracy and Finger Scan Technology.
- To introduce Facial Scan, Iris Scan, Voice Scan and other Biometric Technologies.
- To explain Biometric Solution Matrix and various Biometric Standards.
- To explain the use of Biometrics in Network Security.

**Outcomes:**

Students will be able to

- Understand Finger Scan Technology and Accuracy of Biometrics.
- Understand Facial Scan and Iris Scan Technologies.
- Understand Voice Scan, other physiological Biometrics and Behavioral Biometrics.
- Identify Different Biometric Applications.
- Apply Biometrics for Network Security.

**Prerequisites:**

Data Communication and Computer Networks, Cryptography and Network Security.

**Syllabus:****UNIT -I**

Introduction: Benefits of biometric security – Verification and Identification – Basic working of Biometric matching – Accuracy – False match rate – False non-match rate – Failure to enroll rate – Derived metrics – Layered biometric solutions.

Finger Scan: Features – Components – Operation (Steps) – Competing finger Scan technologies – Strength and weakness. Types of algorithms used for interpretation.

**UNIT -II**

Facial Scan : Features – Components – Operation (Steps) – Competing facial Scan technologies – Strength and weakness.

Iris Scan : Features – Components – Operation (Steps) – Competing iris Scan technologies – Strength and weakness.

**UNIT- III**

Voice Scan: Features – Components – Operation (Steps) – Competing voice Scan (facial) technologies – Strength and weakness.

Other physiological Biometrics: Hand scan – Retina scan – AFIS (Automatic Finger Print Identification Systems)-DNA Scan – Behavioral Biometrics – Signature scan keystroke scan.

**UNIT- IV**

Biometric Applications: Biometric Solution Matrix –Bio privacy Comparison of privacy factor in different biometrics technologies – Designing privacy sympathetic biometric systems. Biometric standards – (BioAPI , BAPI) – Biometric middleware.

### **UNIT -V**

Biometrics for Network Security: Recommended Biometrics for network security, Biometric Spoofing.

#### **Text Books:**

1. Biometrics – Identity Verification in a Networked World – Samir Nanavati, Michael Thieme, Raj Nanavati, WILEY- Dream Tech.
2. Biometrics for Network Security- Paul Reid, Pearson Education.

#### **Reference Books:**

1. Introduction to Biometrics, Anil K. Jain, Arun A. Ross and Karthik Nanda kumar, 2011.
2. Guide to Biometrics, Ruud Bolle, Jonathan Connell, Sharanth Chandra Pankanti, Nalini Ratha and Andrew Senior, 2003.
3. Biometric Systems Technology, Design and Performance Evaluation, by James L. Wayman, Anil K. Jain, Davide Maltoni and Dario Maio, 2004.
4. Handbook of Face Recognition, Stan Z. Li and Anil K. Jain, 2005.

#### **e-Learning Resources:**

1. <http://freevideolectures.com/Course/3252/Biometrics>
2. <http://nptel.ac.in/courses/106104119/>

**IT8T2A****INFORMATION RETRIEVAL SYSTEMS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide the knowledge on information retrieval system capabilities.
- To introduce different computational search problems and evaluate search engines.
- To introduce different applications of informational retrieval techniques in the internet or web environment.
- To discuss about information visualization and system evaluation.

**Outcomes:**

Students will be able to

- Understand various functionalities and capabilities of Information Retrieval System.
- Gain knowledge on cataloging and data structure methodology for IRS.
- Differentiate various clustering algorithms and indexing.
- Differentiate various user search techniques and system search techniques.
- Understand the concepts of information visualization and text search.

**Syllabus:****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, Index Process, Automatic Indexing, Information Extraction.  
Data Structures: Introduction, Stemming Algorithms, Inverted File Structure, 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.

Document and Term Clustering: Introduction, Thesaurus Generation, Item Clustering, Hierarchy of clusters.

**UNIT-IV**

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.

**UNIT-V**

Information Visualization: Introduction, Cognition and Perception, Information Visualization Technologies.

Text Search Algorithms: Introduction, Software Text Search Algorithms, Hardware Text Search Systems.

**Text Book:**

1. Kowalski, Gerald, Mark T May bury: INFORMATION RETRIEVAL SYSTEMS: Theory and Implementation, Kluwer Academic Press, 1997.

**Reference Books:**

1. Gerald Kowalski: INFORMATION RETRIEVAL Architecture and Algorithms.
2. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval data Structures and Algorithms, Prentice Hall, 1992.
3. Modern Information Retrieval by Yates Pearson Education.
4. Information Storage & Retrieval by Robert Korfhage –John Wiley & Sons.

**e-Learning Resources:**

1. <https://class.coursera.org/nlp/lecture/178>
2. <http://cosmolearning.org/courses/database-design-417/video-lectures/>
3. <http://nptel.ac.in/video.php?subjectId=106102064>

**IT8T2B****SOCIAL NETWORKS AND SEMANTIC WEB****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To explain the analysis of the social Web and the design of a new class of applications that combine human intelligence with machine processing.
- To describe how the Semantic Web provides the key in aggregating information across heterogeneous sources.
- To understand the benefits of Semantic Web by incorporating user-generated metadata and other clues left behind by users.

**Outcomes:**

Students will be able to

- Understand the basics of Semantic Web and Social Networks.
- Understand Electronic sources for network analysis and different Ontology languages.
- Modeling and aggregating social network data.
- Develop social-semantic applications.
- Evaluate Web- based social network and Ontology.

**Syllabus:****Unit-I**

Introduction to the Semantic Web and Social Networks:

The Semantic Web- Limitations of the current Web, The semantic solution, Development of the Semantic Web, The emergence of the social web.

Social Network Analysis- What is network analysis, Development of Social Network Analysis, Key concepts and measures in network analysis.

**Unit-II**

Web data, Semantics and Knowledge Representation on the Semantic Web:

Electronic sources for network analysis- Electronic discussion networks, Blogs and online communities, Web-based networks.

Knowledge Representation on the Semantic Web- Ontologies and their role in the Semantic Web, Ontology languages for the Semantic Web(RDF, OWL).

**Unit- III**

Modeling and aggregating social network data:

State-of-the-art in network data representation, Ontological representation of social individuals, Ontological representation of social relationships, Aggregating and reasoning with social network data.

**Unit- IV**

Developing social-semantic applications:

Building Semantic Web applications with social network features, Flink: the social networks of the Semantic Web community, open academia: distributed, semantic-based publication management.



**Unit- V**

Evaluation of web-based social network extraction and Ontologies are us:

Differences between survey methods and electronic data extraction, Context of the empirical study, Data collection, Preparing the data, Optimizing goodness of fit, Comparison across methods and networks, Predicting the goodness of fit, Evaluation through analysis. Ontologies are us: A tripartite model of ontologies, Case studies, Evaluation.

**Text Book:**

1. 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, R.Studer, P.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 - HeinerStuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

**e- Learning Resources:**

1. [http://onlinevideolecture.com/index.php?course\\_id=142&lecture\\_no=18](http://onlinevideolecture.com/index.php?course_id=142&lecture_no=18)
2. <https://docs.google.com/file/d/0B8p6899iTnn3a1Q4NnBqOUJ6R3c/edit>
3. <https://docs.google.com/file/d/0B8p6899iTnn3bkNSUG1sTkR0Rms/edit>

**IT8T2C****BUSINESS INTELLIGENCE****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce the basic concepts of Business Intelligence (BI).
- To impart Knowledge on decision making systems.
- To get familiarize with Data warehouses and model components.
- To introduce model of intelligence and user interface
- To demonstrate international Decision support systems

**Outcomes:**

Students will be able to

- Understand the concepts of Business Intelligence.
- Acquire knowledge about different types of decision making systems.
- Demonstrate Data warehouses and model components
- Employ intelligence models to business.
- Apply data mining techniques in decision support systems.

**Prerequisites:**

Database Systems, Data Mining and Data Warehousing

**Syllabus:****UNIT-I**

Introduction: What is a DSS? Uses of a Decision Support System.

Decision Making: Rational Decisions Bounded Rationality and Muddling Through :Nature of Managers; Appropriate Decision Support: Electronic Memory, Bias in Decision Making.

**UNIT-II**

Group Decision Making: Intuition, Qualitative Data, and Decision Making: How Do We Support Intuition?.Virtual Experience. Business Intelligence and Decision Making Analytics. Competitive Business Intelligence.

Data Component: Specific View toward Included Data; Characteristics of Information Timeliness: Sufficiency, Level of Detail, Understandability, Freedom from Bias, Decision Relevance, Comparability, Reliability, Redundancy, Cost Efficiency, Quantifiability, Appropriateness of Format, More Is Never Better!

**UNIT-III**

Databases, Database Management Systems. Data Warehouses: Data Scrubbing, Data Adjustment, Architecture. Car Example: Possible Criteria, Data Warehouse, Information Uses.

Model Component: Models and Analytics .Options for Models: Representation, Time Dimension, Linearity of the Relationship, Deterministic Versus Stochastic, Descriptive Versus Normative, Causality Versus Correlation, Methodology Dimension, Problems of Models. Data Mining: Intelligent Agents. Model-Based Management Systems: Easy Access to Models. Understandability of Results, Integrating Models, Sensitivity of a Decision, Model Management Support Tools.

**UNIT-IV**

Intelligence And Decision Support Systems: Programming Reasoning : Backward-Chaining Reasoning, Forward-Chaining Reasoning, comparison of Reasoning Processes..

User Interface: Goals of the User Interface .Mechanisms of User Interfaces. User Interface Components: Action Language, Display or Presentation Language, Knowledge Base, Car Example.

**UNIT-V**

International Decision Support Systems: Information Availability Standards : Data Privacy, Data Availability, Data Flow, Cross-Cultural Modeling. Effects of Culture on Decision Support System.

Implementation And Evaluation: Implementation Strategy: Ensure System Does What It Is Supposed To Do the Way It Is Supposed, To Do It, Keep Solution Simple, Develop Satisfactory Support Base. Institutionalize System. Implementation and System Evaluation: Technical Appropriateness, Overall Usefulness. Implementation Success. Organizational Appropriateness.

**Text Book:**

1. "Decision Support Systems for Business Intelligence", Vicki L. Sauter, second edition, a John Wiley & sons, inc. Publication.

**Reference Books:**

1. "Business Intelligence Practices, Technologies, and Management", Rajiv Sabherwal, Irma Becerra-Fernandez, John Wiley & Sons, Inc.
2. "Decision Support Systems and Intelligent Systems", Efraim Turban, Ramesh Sharda, Dursun Delen, 9<sup>th</sup> Edition, Pearson 2011.
3. "Data Mining for Business: Intelligence Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner", Galit Shmueli, Nitin R. Patel and Peter C. Bruce, Wiley, 2007.

**e-Learning resource:**

1. <http://cs.ulb.ac.be/public/teaching/infoh415>
2. <http://www.win.tue.nl/~mpechen/courses/TIES443/#>

## 4/4 B.Tech - SECOND SEMESTER

**IT8T2D****BIG DATA ANALYTICS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- Cloud and lays a strong foundation of Apache Hadoop (Big data framework).
- The HDFS file system, MapReduce frameworks
- Hadoop tools like Hive, and Hbase
- Analyzing data with UNIX tools
- Sorting. Map side and Reduce side joins.

**Outcomes:**

Students will be able to

- Understand the fundamentals of Big cloud and data architectures.
- Learn the concepts of HDFS file systems and interfaces and able to keep HDFS cluster balanced
- Familiarize with map reduce classes, combiner functions and can run map reduce job.
- Aware of classic map reduce and able to apply shuffle and sort on map reducer side.
- Understand The Hive Shell.

**Prerequisites:**

File Structures, Databases, Java, UNIX

**UNIT-I**

Introduction to Big Data. Importance of Big Data. Map Reduce and example psuedocodes for some problems. A brief history of Hadoop. Apache hadoop and the Hadoop EcoSystem. VMWare Installation of Hadoop.

**UNIT-II**

The design of HDFS. HDFS concepts. Command line interface to HDFS. Hadoop File systems. Interfaces. Java Interface to Hadoop. Anatomy of a file read. Anatomy of a file write. Replica placement and Coherency Model. Parallel copying with distcp, Keeping an HDFS cluster balanced.

**UNIT-III**

Introduction. Map reduce: introduction, Analyzing data with unix tools. Analyzing data with hadoop. Java MapReduce classes (new API). Data flow, combiner functions, Running a distributed MapReduce Job. Configuration API. Setting up the development environment. Managing configuration. Writing a unit test with MRUnit. Running a job in local job runner. Running on a cluster.Launching a job. The MapReduce WebUI.

**UNIT-IV**

Classic Mapreduce. Job submission. Job Initialization. Task Assignment. Task execution. Progress and status updates. Job Completion. Shuffle and sort on Map and reducer side. Configuration tuning. Map Reduce Types. Input formats. Output formats ,Sorting. Map side and Reduce side joins.

**UNIT-V**

The Hive Shell. Hive services. Hive clients. The meta store. Comparison with traditional databases. Hive QL. Hbasics. Concepts. Implementation. Java and Mapreduce clients. Loading data, web queries.

**Text Books:**

1. Tom White, Hadoop, "The Definitive Guide", 3<sup>rd</sup> Edition, O'Reilly Publications, 2012.
2. Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch, "Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data", 1<sup>st</sup> Edition, TMH, 2012.

**Reference:**

1. Frank J. Ohlhorst, "Big Data Analytics: Turning Big Data Into Big Money", 2<sup>nd</sup> Edition, TMH,2012.

**e-Learning Resources:**

1. <http://www.cloudera.com/content/cloudera-content/cloudera-docs/HadoopTutorial/CDH5/Hadoop-Tutorial.html>

## 4/4 B.Tech - SECOND SEMESTER

**IT8T3A****ARTIFICIAL INTELLIGENCE****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To explore the challenges and the usefulness of Artificial Intelligence.
- To get familiar with heuristics search algorithms.
- To carry out knowledge representation issues.
- To focus on Symbolic reasoning under uncertainty.
- To introduce basic concepts of game playing and expert systems.

**Outcomes:**

Students will be able to

- Know the challenges and concepts of AI.
- Solve problems using heuristics search algorithms
- Transform knowledge into rules.
- Demonstrate Symbolic reasoning under uncertainty
- Acquainted with expert systems.

**Syllabus:****UNIT-I**

What is AI: The AI Problems, What is an AI Techniques, Criteria for Successes? Problems and problem spaces and Search: Problem as a state space search, Production systems, Problem Characteristics, Production system characteristics.

**UNIT-II**

Heuristic search technique: Generate and test, Hill climbing, Best First search, Problem reduction, Constraint satisfaction, Meansends analysis.

**UNIT-III**

Knowledge Representation issues: Representations and mappings.

Predicate logic: Representing simple facts in logic, Resolution.

Representing knowledge using rules : Procedural knowledge Vs Declarative knowledge, Forward Vs Backward reasoning, matching.

**UNIT-IV**

Symbolic reasoning under uncertainty: Introduction to Non monotonic reasoning, Implementation in DFS and BFS.

Weak, strong slot and filler structures: Semantic nets, Frames, Conceptual dependency, Scripts.

**UNIT-V**

Game playing: The min-max search procedure, adding alpha-beta cutoffs.

Planning: Goal stack planning, Hierarchical planning.

Expert Systems: Expert system shells, Knowledge acquisition.

Perception and action: Perception, action, Robot architecture.

**Text Book:**

1. Artificial Intelligence, 2<sup>nd</sup> Edition, E.RichardK. Knight (TMH).

**Reference Books:**

1. Artificial Intelligence and Expert Systems–Patterson PHI
2. Expert Systems Principles and Programming-Fourth Edn, Giarrantana/Riley,Thomson
3. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition–Pearson Education.

**e-Learning Resources:**

1. <http://www.jntuk-coeerd.in/>
2. <http://nptel.ac.in/video.php?subjectId=106105079>
3. [http://nptel.iitk.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New\\_index1.html](http://nptel.iitk.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New_index1.html)

**IT8T3B****ADVANCED OPERATING SYSTEMS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To explain about process synchronization.
- To provide knowledge on distributed operating systems.
- To discuss failure recovery and fault tolerance
- To demonstrate various multi processor operating systems.

**Outcomes:**

Students will be able to

- Understand process synchronization problems.
- Understand the various concepts of distributed operating systems.
- Gain knowledge on different issues in distributed resource management and architecture algorithms.
- Analyze the techniques of different failure recovery and fault tolerance.
- Understand the structure of multiprocessor operating systems and design issues.

**Pre-requisite:**

Operating Systems Concepts.

**Syllabus:****UNIT -I**

Process Synchronization- Overview, function of an operating system, design approaches ,types of advanced operating systems, synchronization mechanism ,concepts of a process, concrete process, the critical section problem, other synchronization problems-languages mechanism for synchronization- process dead locks, preliminaries, models of deadlocks, models of resources , A graph theoretic model of a system state, necessary and sufficient condition for dead lock

**UNIT-II**

Distributed operating systems- Introduction-issues in distributed operating systems, communication primitives, inherent limitations, Lamport's logical clock; vector clock; casual ordering; global state; cuts; termination deduction. Distributed mutual exclusion-non token based algorithms- token based algorithms-suziki-kasamsi's broadcast algorithms-distributed deadlock detection-issues in deadlock detection and resolution, centralized deadlock deduction algorithms-distributed dead lock deduction algorithms

**UNIT-III**

Distributed resource management- Distributed file systems, architecture-mechanisms, design issues, distributed shared memory, architecture-algorithm, protocols design issues. Distributed scheduling, issues, components-algorithms

**UNIT-IV**

Failure recovery and fault tolerance- Basic concepts, classification of failures-basic approaches to recovery; recovery in concurrent systems; synchronous and asynchronous check pointing and recovery; checking in distributed database systems; fault tolerance-issues-two ,phase and non blocking commit protocols; voting protocols; dynamic voting protocols

**UNIT-V**

Multi processor and operating systems-Structures of multiprocessor operating systems, design issues, threads, process synchronization-processor scheduling-memory management, reliability/fault tolerance.

**Text Book:**

4. Mukesh Singhal and N.G. Shivaratri, "Advanced Concepts in Operating Systems", McGraw-Hill, 2000.

**Reference Books:**

1. Abraham Silberschatz, Peter B. Galvin, G. Gagne, " Operating System Concepts", 8<sup>th</sup> Edition, Addison Wesley publishing Co.
2. Andrew S. Tanenbaum, " Modern Operating Systems", 2001.

**e-LEARNING RESOURCES:**

1. <http://www.jntuk-coeerd.in/>
2. <http://stst.elia.pub.ro/news/SO/Modern%20Operating%20System%20-%20Tanenbaum.pdf>



**IT8T3C****MACHINE LEARNING****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce machine learning problems corresponding to different applications.
- To learn concepts of Decision tree learning and artificial neural networks.
- To discuss Bayesian learning and computational learning theory.
- To provide basic Knowledge on Instance based learning.

**Outcomes:**

Students will be able to

- Understand the perspectives and issues in machine learning.
- Understand the concepts of decision tree learning and artificial neural networks.
- Design and implement various concepts in Bayesian learning.
- Apply the concept of computational learning theory.
- Know the concept of instance based learning.

**Prerequisite:**

Data Mining and Data Warehousing.

**Syllabus****UNIT – I**

Introduction: Well- posed learning problems, designing a learning system, Perspectives and issues in machine learning

Concept Learning and the General to Specific Ordering: Concept learning task, concept learning as search, Find-S: finding a Maximally Specific hypothesis, Version Spaces and the Candidate-Elimination algorithm and inductive bias.

**UNIT – II**

Decision Tree Learning: Hypothesis space search in Decision Tree learning, inductive bias in Decision Tree learning, Issues in Decision Tree learning.

Artificial Neural Networks: Neural Network representations, appropriate problems for Neural Network learning, Perceptrons, Multilayer Networks and the Back propagation algorithm and remarks on the Back propagation algorithm.

**UNIT – III**

Bayesian Learning: Bayes theorem and concept learning, maximum likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum description length principle, Bayes optimal classifier, Naive Bayes classifier, Bayesian belief networks.

**UNIT – IV**

Computational learning theory: Introduction, probably learning an approximately Correct hypothesis, sample complexity for finite hypothesis spaces, and sample complexity for infinite hypothesis spaces and mistake bound model of learning.

**UNIT – V**

Instance Based Learning: Introduction, k-Nearest Neighbor learning, locally weighted regression, radial basis functions, Case Based Reasoning and remarks on Lazy and Eager learning.

**Text Book:**

1. Tom M. Mitchell, "Machine Learning", Mc. Graw Hill Publishing

**e-Learning Resources:**

1. <http://ocw.mit.edu>
2. [http://www.cs.cmu.edu/~tom/10701\\_sp11/lectures.shtml](http://www.cs.cmu.edu/~tom/10701_sp11/lectures.shtml)

**IT8T3D****ADVANCED COMPUTER NETWORKS****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To introduce the concepts of advanced networking.
- To discuss about the SONET/SDH concepts.
- To discuss about the Frame Relay and ATM Layers concepts.
- To introduce the specialized areas of networking such as the design and maintenance of individual networks.

**Outcomes:**

Students will be able to

- Understand the Wired and Wireless Networks.
- Understand the concept of SONET/SDH standards.
- Differentiate the concepts of Frame Relay and ATM Layers.
- Gain knowledge on domain name services.
- Understand message transfer protocols including SMTP, POP3, and IMAP.

**Prerequisite:**

Data communications and computer networks

**UNIT-I**

Wired LANs: IEEE Standards, Standard Ethernet, Fast Ethernet, Gigabit Ethernet

Wireless LANs: IEEE 802.11, Bluetooth

Wireless WANs: Cellular Telephony, Satellite Networks.

**Unit-II**

Optical Networking: SONET/SDH standards, Architecture, SONET LAYERS, SONET FRAMES, STS MULTIPLEXING, SONET NETWORKS.

**UNIT-III**

Virtual-Circuit Networks: Frame Relay and ATM Architecture, Frame Relay Layers, Extended, RRADs, VOFR, LMI, Congestion Control and Quality of Service.

ATM: Design Goals, Problems, Architecture, Switching, ATM Layers, Congestion Control and Quality of Service.

**UNIT-IV**

Application Layer: Domain Name System Namespace, Domain Name space, Distribution of Name Space, DNS in the Internet, Resolution, DNS Messages, Types of Records, Registrars, Dynamic Domain Name System (DDNS). Encapsulation

**UNIT-V**

Remote Logging, Electronic Mail and File Transfer: Remote Logging, Electronic-Mail: Architecture, User Agent, Messages Transfer Agent: SMTP, Message Access Agent: POP and IMAP, Web-Based Mail, File Transfer: File Transfer Protocol, Anonymous FTP.

WWW and HTTP: Architecture, Web Documents, HTTP.

**Text Book:**

1. B. A. Forouzan, "Data Communications and Networking", Tata McGraw Hill edition, 4<sup>th</sup> Edition

**Reference Books:**

1. Computer Networking A Top Down Approach Featuring the Internet, Kurose & Rose, 3<sup>rd</sup> Edition, Pearson.
2. Computer Networks A Systems Approach, 5<sup>th</sup> Edition, Larry L.Pearson and Bruce S.Davie, Morgan Kaufmann (Elsevier).
3. Data and Computer Communication , 8<sup>th</sup> Edition, William Stallings, Pearson.

**E-Learning Resources:**

1. <http://www.jntuk-coeerd.in/>
2. <http://textofvideo.nptel.iitm.ac.in/video.php?courseId=106105081>
3. <http://freevideolectures.com/Course/2276/Computer-Networks/9>

## 4/4 B.Tech - SECOND SEMESTER

**IT8PW****PROJECT WORK****Credits:9****Internal assessment: 100 marks****Lab: - 9 Periods /week****Semester end examination: 200 marks**

Students need to implement an IEEE published paper or any published paper with impact factor or any real time application.

**Objectives:**

- To develop a product that has passed through the design, analysis, testing, and evaluation stages.
- To develop problem solving, analysis, synthesis and evaluation skills.
- To encourage teamwork and improve student's communication skills.

**Outcomes:**

Students will be able to

- Formulate a real world problem and identify its requirements.
- Express technical ideas, strategies and methodologies in document form.
- Self learn new tools, algorithms and/or techniques that contribute to the solution of the project.
- work as a member and/or leader of a team in project development

# OUR OTHER INSTITUTIONS :

1. Parvathaneni Brahmayya Siddhartha College of Arts & Science
2. Parvathaneni Brahmayya Siddhartha Junior College of Arts & Science
3. Veeramachaneni Paddayya Siddhartha Public School
4. Velagapudi Ramakrishna Siddhartha Engineering College
5. Sri Durga Malleswara Siddhartha Mahila Kalasala
6. Sri Durga Malleswara Siddhartha Junior Mahila Kalasala
7. Y.V. Rao Siddhartha College of Education
8. Sri Velagapudi Durgamba Siddhartha Law College
9. K.C.P. Siddhartha Adarsh Residential Public School
10. K. V. Sadasiva Rao Siddhartha College of Pharmaceutical Sciences
11. A.G. & S.G. Siddhartha Arts & Science College
12. A.G. & S.G. Siddhartha Arts & Science Junior College
13. Siddhartha Institute of Hotel Management & Catering Technology
14. Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation
15. Siddhartha School of Nursing
16. Drs. Sudha & Nageswara Rao Siddhartha Institute of Dental Sciences
17. Dr. C. Sobhanadri Siddhartha College of Nursing



