

# **Scheme – 2013**

Scheme and Syllabus for III, IV, V, VI,VII &VIII Semester of Four year B.Tech. Degree Course in **CSE** 

Department of Computer Science and Engineering G. Pulla Reddy Engineering College (Autonomous): Kurnool Accredited by NBA of AICTE and NAAC of UGC Affiliated to JNTUA, Anantapuramu.

### Vision and Mission of the Department:

#### Vision :

The department aims to become a leader in the field of education, training and research in Computer Science and Engineering.

#### Mission :

**Mission 1:** To strengthen the core competence in computer Science and Engineering by imparting quality education and training.

**Mission 2:** To promote innovation and research through collaborative and participatory approaches.

**Mission 3:** To inculcate the leadership capabilities, ethical values and professional behavior to face the challenges in global market.

### Program Educational Objectives(PEOs)

Program Educational Objectives(PEOs) of the under graduate programme in Computer Science and Engineering at G.Pulla Reddy Engineering College (Autonomous), Kurnool are to prepare the graduates to possess the ability to

**PEO1:** Analyze, Design and Develop computer based systems and applications using core areas of Computer Science & Engineering.

**PEO2:** Be engineering professionals, innovators, entrepreneurs engaged in their profession with social awareness and ethical values.

**PEO3:** Work in teams in multi-disciplinary areas to address the needs of society.

### Program Specific Outcomes(PSOs) :

 $\ensuremath{\textbf{PSO1}}$  : Understand the principles, structure and development methodologies of system software

**PSO2** : Design, develop, implement and test application software for systems including distributed software systems.

**PSO3** : Understand the architecture and organization of computer systems, embedded systems and networked systems.

## FOUR YEAR B.TECH. DEGREE COURSE

S. No	No. Course		Candita	Scheme of Instruction p_eriods/ <u>w</u> eek		Scheme of Examination Maximum Marks			
5. NO	No.	Course Title	Creans	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks
Ι		Theory							
1.	HU201	Managerial Economics & Financial Accountancy	3	3	0	0	70	30	100
2.	CS201	Object Oriented Programming	3	3	0	0	70	30	100
3.	CS203	Switching Theory and Logic Design	3	3	1	0	70	30	100
4.	CS204	Discrete Structures & Graph Theory	3	3	1	0	70	30	100
5.	CS205	Computer Organization and Architecture	3	3	0	0	70	30	100
6.	CS206	Data Structures	3	3	0	0	70	30	100
7.	ML201	Quantitative Aptitude	2	1	1	0	-	100	100
п		Practical							
8.	CS202	Object Oriented Programming Lab	2	0	0	3	70	30	100
9.	CS207	Data Structures Lab	2	0	0	3	70	30	100
		Total	24	19	03	06	560	340	900

Scheme of Instruction and Examination (Effective fro m 2013-2014)

CSE– III Semester

Scheme: 2013

### FOUR YEAR B.TECH. DE GREE COURSE

Scheme of Instruction and Examination (Effective from 2013-2014)

CSE – I	V Sem	ester
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S No.	Course		Credita	Scheme of Instruction pe_riods/ <u>w</u> Eek		Scheme of Examination Maximum Marks			
5.110	No.	Course Title	Credits	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks
Ι		Theory							
1.	CS208	Operating System	3	3	1	0	70	30	100
2.	CS209	Computer Graphics	3	3	0	0	70	30	100
3.	CS210	Database Management Systems	3	3	1	0	70	30	100
4.	CS212	Java Programming	3	3	1	0	70	30	100
5.	CS214	Principles of Data Communication	3	3	0	0	70	30	100
6.	ML202	Soft Skills	2	1	2	0	-	100	100
II		Practical							
7.	EC213	Basic Electronics Lab	2	0	0	2	70	30	100
8.	CS211	Database Management Systems Lab	2	0	0	2	70	30	100
9.	CS213	Java Programming Lab	2	0	0	3	70	30	100
		Total	23	16	05	07	560	340	900

Scheme: 2013

#### HU201: MANAGERIAL ECONOMICS & FINANCIAL ACCOUNTANCY (MEFA) (Common to B.Tech III Semester CSE & ECE)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand the nature and scope of managerial economics and the role of managers in firms.
- 2. Understand the demand conditions and various factors influencing demand elasticity.
- 3. Understand various elements of demand forecasting and its techniques
- 4. Understand the concepts of production and cost analysis and the concept of equilibrium price and output in different market situations.
- 5. Understand different forms of business organizations and the significance of capital, factors determining the requirement of working and fixed capital and their sources.
- 6. Understand the principles and problems of accountancy.

# Unit: 1

# **Introduction to Managerial Economics & Demand Analysis**

**Managerial Economics**: Definition of Managerial Economics, Characteristics and Scope, Managerial Economics and its Relation with other subjects and its Uses, Role and Responsibilities of Managerial Economist.

**Demand Analysis:** Meaning, Types of Demand, Demand Determinants, Law of Demand- Its assumptions and exceptions, Law of Diminishing Marginal Utility

# Unit: 2

# **Elasticity of Demand and Demand Forecasting**

**Elasticity of Demand:** Definition, Types of Elasticity of Demand, Practical Significance of price elasticity of demand, Measurement of Price Elasticity of Demand

**Demand forecasting** – Importance, Factors, Purposes of Demand Forecasting, Methods of Demand Forecasting.

# Unit: 3

# Theory of production & cost analysis and Market Structures

**Production Analysis:** Meaning of production function, Isoquants & Isocosts, The law of diminishing Marginal Returns, Law of Returns to Scale, Internal and External Economies of scale. **Cost Analysis:** Cost concepts, Cost output relationship for Short Run and Long Run, Break Even Analysis – Its Importance, Limitations and Managerial uses

**Market Structures:** Types and Features of different Competitive situation–Perfect Competition – Monopoly – Monopolistic and Oligopolistic Competition, Price output determination in case of perfect competition and Monopoly.

# Types of Business Organizations & Capital and its Significance

**Types of Business Organizations:** Features and Evaluation of Sole Proprietorship, Partnership, Joint Stock Company.

**Capital and its Significance:** Types of Capital – Estimation of fixed and working capital requirements – Methods and sources of raising fixed and working capital

# Unit: 5

# **Introduction to Financial Accountancy**

**Principles of Accountancy:** Introduction to Accountancy, Double Entry System of Book Keeping-Meaning – Scope – Advantages, Journal Entries, Ledger, Preparation of Trial Balance. **Unit: 6** 

# **Final Accounts**

**Preparation of Final Accounts:** Trading Account, Profit & Loss Account, Balance Sheet with adjustments, Final Accounts problems.

## **TEXT BOOKS:**

- 1. Varshiney and Maheswari, Managerial Economics, Sultan Chand & Co, New Delhi
- 2. Y.K Bhushan, Business Organization & Management, S Chand & Co., New Delhi.
- 3. S.P Jain and K.L Narang, Financial Accounting, Kalyani Publishers, New Delhi.

## **REFERENCE BOOKS:**

- 1. Shukla & Grewal, Advanced Accountancy, S.Chand& Co., New Delhi
- 2. M.C Shukla, Business Organization and Management, S.Chand& Co., New Delhi.

# NOTE:

**Internal Assessment:** The question paper for Sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### CS201: OBJECT ORIENTED PROGRAMMING (OOP) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С	
3	0	0	3	

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand the fundamentals of C++
- 2. Explain the concept of class, object, constructors and destructors.
- 3. Illustrate the concept of function and operator overloading.
- 4. Classify different types of inheritance and polymorphism.
- 5. Demonstrate the concept of templates and files.
- 6. Understand the concept of exceptions.

# Unit: 1

**Introduction to C++:** Origins of C++, Differences between C and C++, OOP Concepts, C++ fundamentals, basic data types, C++ tokens, Structure of C++ program, Operators, type casting, Functions and Pointers in C++.

# Unit: 2

**Classes, Objects, Constructors & Destructors:** Class, Objects, scope resolution operator, defining member functions, Structures and Classes are related, Unions and Classes are related, anonymous unions, friend functions, friend classes, inline functions, nested classes, local classes.

Constructor, Types of constructors, Static class members, destructors, execution of constructors and destructors, passing objects to functions, returning objects, object assignment.

# Unit: 3

**Function & Operator Overloading:**Function overloading, overloading constructors, finding address of an overloaded function, function overloading and ambiguity.Operator Overloading, creating a member operator function, operator overloading using a friend function, Overloading new and delete, overloading special operators.

# Unit: 4

**Inheritance, Virtual functions & Polymorphism:**Inheritance, types of inheritance, Inheritance and protected members, inheriting multiple base classes, Constructors, Destructors and inheritance, virtual base class.

Virtual Functions and Polymorphism: Virtual functions, Virtual functions are hierarchical, Pure Virtual functions, Early vs. Late binding.

**Templates & C++ Files :** Templates, various types of templates, class templates, class templates with multiple parameters, function templates, function templates with multiple parameters, overloading of template functions, member function templates.

C++ Files: Opening and closing a file, reading and writing text files.

### Unit: 6

**Exception Handling:**Exception, exception handling fundamentals, multiple catch statements, catching multiple exceptions, re-throwing exception, exceptions in constructors and destructors, exceptions and operator overloading, exceptions and inheritance, class templates with exception handling.

### **TEXT BOOKS:**

- 1. Herbert Scheldt, [4<sup>th</sup> edition], The Complete Reference C++, Tata McGraw-Hill.(2,3 units).
- Ashok N. Kamthane [2013], [2<sup>nd</sup> edition], Programming in C++, Pearson.(1,6units)
- 3. E. Balaguruswamy, [2008], Object oriented programming with C++(4,5units).

#### **REFERENCE BOOKS:**

1. A. K. Sharma, [2014], Object-Oriented Programming with C++, Pearson.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### CS203: SWITCHING THEORY AND LOGIC DESIGN (STLD) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3 Hrs

L	T/D	Р	С
3	1	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understanding number conversions, Error detection and correction mechanisms : parity, checksum, hamming codes.
- 2. Apply the Axioms and theorems of Boolean Algebra for minimization of Boolean functions, canonical forms.
- 3. Apply the minimization procedures using Karnaugh map ,Tabulation method, prime implication chart to obtain minimal SOP and POS.
- 4. Designing combinational circuits: Encoders, Decoders, Multiplexers, ROM, PLA.
- 5. Designing Sequential circuits using Flip-flops and sequential logic.
- 6. Design Registers: Shift Register, Bi directional Shift Register and counters: Ring Counter, Johnson Counter.

# Unit: 1

**Number System & Binary Codes:** The Decimal, Binary, Octal, Hexadecimal Number System, Number Base Conversions, Complements, Binary Arithmetic in Computers, Weighted Binary codes, Non Weighted Binary codes, Error Detecting Codes, Error Correcting Codes, Parity Checking.

# Unit: 2

**Boolean Algebra & Minimization of Boolean Functions:** 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.

# Unit: 3

**Simplification of Boolean Functions:** The Map Method, Two, Three, Four, Five and Six variable maps, Product of Sums Simplification, NAND and NOR Implementations, Other two Level Implementations, Don't Care Conditions, The Tabulation Method, Determination of Prime Implicants, Selection of Prime Implicants.

**Combinational Logic:** Introduction, Design Procedure, Adders, Subtractors, Code Conversion, Analysis Procedure, Multilevel NAND Circuits, Multilevel NOR Circuits, Exclusive-or and Equivalence Functions.

**Combinational Logic with MSI & LSI:** Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Multiplexers, Read Only Memory (ROM), Programmable Logic Array (PLA).

# Unit: 5

**Sequential Logic:** Introduction, Flip Flops, Triggering of Flip Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip Flop Excitation Tables, Design Procedure, Design of Counters, Design with State Equations.

# Unit: 6

**Registers:** Introduction, Registers - Registers with parallel load, Sequential Logic Implementation, Shift Registers - Serial Transfer, Bi-directional Shift Register with parallel load, Serial Addition. **Counters :** Ripple Counters - Binary Ripple Counter, BCD Ripple Counter, Synchronous Counters - Binary Counter, Binary Up-Down Counter, Johnson Counter.

## **TEXT BOOKS:**

1. M.Morris Mano [2011], Digital Logic and Computer Design, Pearson Education, III Edition (1,2,3,4,5,6 units).

## **REFERENCE BOOKS:**

- 1. Zvi Kohavi [2008], Switching and Finite Automata Theory, TMH.
- 2. F.J.Hill and G.R.Peterson [1981], [3<sup>rd</sup> Edition], Introduction to switching theory and logic Design.
- 3. Donald D. Givone [2006], [4<sup>rd</sup> Edition], Digital Principles and Applications, Tata Mc Graw Hill.
- 4. Thomson [1999], Fundamentals of Logic Design.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS204: DISCRETE STRUCTURES & GRAPH THEORY (DSGT) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	1	0	3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand the validity of statements using connectives, tautologies, equivalence and implications.
- 2. Solve the problems using normal forms, statement calculus and predicate calculus
- 3. Apply permutations and combinations in solving real life problems.
- 4. Solve recurrence relations using substitution, generating functions and characteristic roots methods.
- 5. Summarize the properties of graphs, planar graphs, Hamiltonian graphs, Euler graphs, spanning trees and binary trees.
- 6. Understand the association between the elements of sets using digraphs and Warshall algorithm.

# Unit: 1

**Mathematical Logic**: Statements & Notation, Connectives, Well Formed Formulas, tautologies, Equivalence & implications, Duality law, other connectives.

# Unit: 2

**Normal forms:** Normal forms, Theory of inference for statement calculus, Predicate Calculus, Inference Theory of predicate calculus.

# Unit: 3

**Elementary Combinatorics:** Combinatorics – Permutations & Combinations, Enumeration of Combinations and Permutations without repetition

# Unit: 4

**Recurrence Relations:** Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, the Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations.

# Unit: 5

**Graphs:** Basic Concepts, Isomorphism and Sub graphs, Trees and Their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

### Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary

Relations, Equivalence Relations. Digraphs: Operations on Relations, Paths and Closures, Directed Graphs and Adjacency Matrices, Warshalls algorithm.

### **TEXT BOOKS:**

- 1. Trembly.J.P and manohar.R [2011], Discrete mathematical structures with applications to computer science, Mc-Graw-Hill International Editions. (1,2 Units).
- 2. Joe L.Mott, Abraham Kandel and Theodore P.Baker [2008], [2<sup>nd</sup> Edition], Discrete Mathematics for Computer Scientists and Mathematicians, PHI.(3,4,5,6 Units).

### **REFERENCE BOOKS:**

- 1. Dr S.Chandrasekharaiah, Mathematical foundations of computer science, -Prism books Pvt.Ltd.
- 2. Graph Theory, Narsingh Deo, PHI Publications. 2003
- 3. Ralph P.Grimaldi [2006], [5<sup>th</sup> Edition], Discrete and Combinational Mathematics-An Applied Introduction, Pearson Education.
- 4. Liu [2004], Elements of discrete mathematics, McGraw-Hill.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## CS205: COMPUTER ORGANIZATION AND ARCHITECTURE (COA) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70

**End Exam Duration : 3 Hrs** 

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the organization of basic computer, instructions and programming basic computer.
- 2. Understand the working of central processing unit, RISC and CISC Architecture.
- 3. Understand the operation of the arithmetic unit, addition, subtraction, multiplication & division algorithms.
- 4. Understand the design of micro programmed control unit.
- 5. Understand the Parallel Processing and pipelining.
- 6. Understand input/output organization and mechanisms.
- 7. Understand memory hierarchy, the organization of memory, memory management, cache memories and virtual memory.

## Unit: 1

### **Basic Computer Organization and Design**

Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.

# Unit: 2

### **Programming The Basic Computer**

Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.

Micro Programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.

### Unit: 3

### **Central Processing Unit**

Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.

# Unit: 4

### **Pipeline and Vector Processing**

Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms.

## **Input/output Organization**

Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.

# Unit: 6

The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache Memories -Mapping Functions, Virtual Memories, Secondary Storage.

## **TEXT BOOKS:**

- 1. M. Morris Mano [2011], [3<sup>rd</sup> Edition], Computer system architecture, Pearson Education.(1,2,3,4,5 Units).
- 2. Carl Hamacher, Zvonko Vraneșie, Safwat Zaky [2002], [5<sup>th</sup> Edition], Computer Organization, McGraw-Hill.(6<sup>th</sup> Unit)

## **REFERENCE BOOKS:**

- Hayes John .P [1998], Computer architecture & organization, MGH.
  Willam Stallings [2003], [6<sup>th</sup> Edition], Computer Organization and Architecture Desinigning for performance, Pearson [PHI].

### NOTE:

Internal Assessment: The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### CS206: DATA STRUCTURES (DS) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand the importance of a data structure and demonstrate the use of an Array Data Structure.
- 2. Demonstrate the use of a Linked List Data structure by performing Insertion, Deletion, and Traversing operations.
- 3. Understand the basic principles of Stack and Queue Data Structures and their applications.
- 4. Understand the operations performed on Binary search Trees and AVL Trees.
- 5. Apply different sorting techniques such as Insertion Sort, Quick Sort, Merge Sort to sort the given data.
- 6. Organize the data using various Hashing techniques for efficient searching.

## Unit: 1

**Introduction to Data Structures:** Definition, Classification of Data structures, Sequential storage representation – Arrays, Applications of arrays – Linear Search, Binary Search, Bubble Sort, Merging of arrays.

# Unit: 2

**Linked Lists:** Pointer and Linked storage representation, Types of Linked Lists – Single linked list, Double linked list, Circular linked list, Operations on linked lists- Traversing, Searching, Insertion and Deletion, Applications of linked lists – Polynomial manipulation.

# Unit: 3

**Linear Data Structures- Stacks:** Representation of Stacks using sequential storage and linked allocation methods, Operations on Stacks, Applications of Stacks- Recursion, Polish notations, Conversion of infix to post fix notation, Evaluation of postfix expression.

**Linear Data Structures- Queues:** Representation of Queues using sequential and linked allocation, Operations on Queues, Circular queue.

# Unit: 4

**Nonlinear Data Structures- Trees:** Basic terminology, Binary trees, Representation of Binary trees in memory using arrays and linked lists, Operations on binary trees- Insertion, Deletion and Traversing-Preorder, Inorder and Postorder, Applications of binary trees, Threaded binary trees, AVL trees and their operations.

**Special Trees :** Splay trees, B-Trees and their operations. **Sorting:** Insertion sort, Selection sort, Merge Sort, Quick sort.

# Unit: 6

**Priority Queues (Heaps):** Model, simple implementations, Binary heap, Applications of priority queues- Heap sort, d-heaps, Leftist heaps, Skew heaps, Binomial queues.

**Hashing Techniques:** Definition, Hash function, Open hashing (separate chaining), Closed hashing(open addressing)– Linear probing, Quadratic probing, Double hashing, Rehashing, Extendible hashing.

## **TEXT BOOKS:**

- 1. Jean Paul Tremblay and Paul G.Sorenson [2007], An Introduction to Data Structures With Applications, TMH.(1,2,3,4units).
- 2. Mark Allenweiss [2008], Data Structures and Algorithm Analysis, Pearson Education.(5,6units).

# **REFERENCE BOOKS:**

- 1. Data Structures and Algorithms by G. A. V. Pai.
- 2. N.Kasiviswanath [2008], Data Structures Using C++, Laxmi Publications
  - (P)LTD. 3. E.Balaguruswamy [2008], Object Oriented programming with C++.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## ML201:QUANTITATIVE APTITUDE (QA) (Common for all branches of B.Tech - III Semester)

Scheme : 2013 Internal Assessment : 100

L	T/D	P	С
1	1	0	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Solve quantitative aptitude problems on number systems, Coordinate Geometry, Stocks, shares, Bankers discounts.
- 2. Interpret data using bar graphs, pie charts, line graphs.
- 3. Apply reasoning and logic to solve various puzzles and brain teasers.

**Numerical Ability:** Number Systems, HCF and LCM, Decimal Fractions, Square Roots and Cube Roots, Linear and Quadratic Equations. Averages, Mixtures & Allegations, Ages, Ratios, Proportions and Variations, Percentages, Profit and Loss. Time, Speed and Distance, Time and Work. Permutations and Combinations, Probability, Clocks and Calendars

Introduction to concepts of Reasoning: Cubes, Series and sequences, Odd man out, Coding and decoding

General Mental Ability: Puzzles and Teasers

#### **References Books:**

- 1. Arun Sharma, *How to Prepare for Quantitative Aptitude*, TMH Publishers, New Delhi.
- 2. R.S. Aggarwal, *Quantitative Aptitude*, S.Chand Publishers, New Delhi.
- Sharon Weiner-Green, *Ira K.Wolf, Barron's GRE,* Galgotia Publications, New Delhi.
  4. Ethnus, *Aptimithra*, McGraw Hill Publishers
- 4. R.S Aggarwal, *Verbal and Non-Verbal Reasoning*, 5. Chand Publishers, New Delhi.
- Shakuntala Devi, *Puzzles to Puzzle You*, Orient Paper Backs Publishers, New Delhi.
  Shakuntala Devi, *More Puzzles*, Orient Paper Backs Publishers, New Delhi.
- 8. Ravi Narula, Brain Teasers, Jaico Publishing House, New Delhi.
- 9. George J Summers, Puzzles and Teasers, Jaico Publishing House, Mumbai.

### DISTRIBUTION AND WEIGHTAGE OF MARKS

There shall be four objective type (Paper / PC based) tests, carrying 25 marks each, during the semester. The sum of the marks scored in all these four tests shall be the final score.

#### CS202: OBJECT ORIENTED PROGRAMMING LAB (OOP(P)) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Execute C++ programs using classes and objects.
- 2. Develop programs using constructors and destructors.
- 3. Implement operator overloading and function overloading.
- 4. Implement hierarchical, hybrid inheritance and polymorphism.
- 5. Execute templates and files.
- 6. Implement exception handling in C++.

### List of Experiments:

- 1. Programs using Classes and Objects.
- 2. Program to design Constructors and Destructors.
- 3. Program to design Operator Overloading.
- 4. Program for Function Overloading.
- 5. Programs to implement the concept of Friend Functions.
- 6. Program for hierarchical inheritance.
- 7. Program to design hybrid inheritance.
- 8. Program to demonstrate Polymorphism.
- 9. Programs to read and write Files.
- 10. Programs to perform various operations on Files.
- 11. Programs to implement Templates.
- 12. Programs to implement Exception Handling.
- 13. Program to handle exceptions in constructors and destructors.

#### CS207: DATA STRUCTURES LAB (DS(P)) (For B.Tech III Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement a Linked List(single & double) and perform Insertion, Deletion and Traversing operations on it.
- 2. Implement Stack and Queue Data Structures using Arrays and Linked Lists
- 3. Implement a program to convert an Infix expression into a Postfix expression and Evaluate the Postfix expression.
- 4. Sort the elements of an array using Quick sort, Merge Sort, Insertion sort and Heap Sort techniques.
- 5. Perform Insertion, Deletion and Traversing operations on a Binary Search Tree.
- 6. Organize the data using various Hashing techniques for efficient searching.

#### List of experiments:

- 1. Searching
  - (a) Linear Search.
  - (b) Binary Search.
- 2. Bubble Sort and Merging of Arrays.
- 3. Linked lists
  - (a) Implementation of Single Linked Lists.
  - (b) Implementation of Double Linked Lists.
- 4. Stacks
  - (a) General Stack.
  - (b) Stack using Linked Lists.
- 5. Applications of Stacks
  - (a) Infix to Postfix conversion.
  - (b) Evaluation of Postfix Expression.
- 6. Queues
  - (a) Circular Queue using Arrays.
  - (b) Queue using Linked lists.
- 7. Trees- Operations on Binary Search Trees

- (a) Insertion.
- (b) Deletion.
- (c) Traversing.
- 8. Quick Sort.
- 9. Insertion Sort.
- 10. Merge Sort.
- 11. Heap Sort
- 12. Implementation of Hashing techniques.

#### CS208: OPERATING SYSTEM (OS) (For B.Tech IV Semester CSE)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration: 3 Hrs

L	T/D	Р	С
3	1	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the OS design structures and its services
- 2. Understand the concepts of process scheduling, synchronization and its implementation
- 3. Exemplify the contiguous, linked, indexed memory management techniques and virtual memory
- 4. Understand the structure and organization of file system and secondary storage structure
- 5. Determine the prevention, avoidance, detection, recovery mechanism of deadlock
- 6. Understand system security, network security, protection, security mechanisms.
- 7. Appreciate kernel design principles, process management in Linux environment

# Unit: 1

**Introduction:** What Operating Systems Do, Operating System Structure, Operating System Operations, Overview of Process Management, Memory Management, Storage Management, Protection and Security, **System Structures-** Operating System Services, User Operating System Interface, System Calls, Operating System Structure, Virtual machines.

# Unit: 2

**Process Management:** Process Concepts, Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Multithreading Models.

**Process Scheduling:** Basic concepts, Scheduling Criteria, Scheduling Algorithms, **Synchronization**-Background, The Critical-Section Problem, Peterson's Solution, Semaphores, Monitors.

# Unit: 3

**Memory Management:** Background, Swapping, Contiguous Memory Allocation, Paging, Structure of the Page table, Segmentation.

**Virtual Memory Management-**:Background, Demand paging, Page Replacement, Allocation of Frames, Thrashing.

# Unit: 4

### **Storage Management**

**File System:** File Concepts, Access Methods, Directory and Disk Structure, Implementation of file System Structure- file system Structure, file-system Implementation,

Directory Implementation, Allocation Methods, Free-Space Management.

Secondary Storage Structure: Overview of Mass-Storage Structure, Disk Structure, Disk Scheduling.

**Deadlocks:** System Models, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance –Bankers Algorithm, Deadlock Detection, Recovery from Deadlock.

# Unit: 6

**Protection and Security:** Goals of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of access rights, System Security-The Security problem, System and Network Threats.

**CASE STUDY: The Linux Operating System:** History, Design Principles, Kernel Modules, Process Management.

## **TEXT BOOKS:**

1. Silberschatz and Galvin [2008], Operating System Concepts, 8<sup>th</sup> edition, WILEY INDIA

Edition. (1, 2, 3, 4, 5,6 units).

## **REFERENCE** BOOKS:

1. Gagne [2003], [6<sup>th</sup> Edition], Operating System Concepts, John Wiley & Sons, Inc publishers.

2. Tanenbaum [2000], Modern Operating System, Pearson Education.

## NOTE:

**Internal Assessment:** The question paper for Sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### CS209: COMPUTER GRAPHICS (CG) (For B.Tech IV Semester CSE)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration: 3 Hrs

L	T/D	Р	С	
3	0	0	3	

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand DDA, Bresenhams line drawing algorithms and Midpoint circle generating algorithms.
- 2. Classify CRT, Color CRT, DVST, Flat Panel display devices and Graphical Input Devices.
- 3. Interpret scan line polygon fill, Boundary fill and Flood Fill Algorithms
- 4. Exemplify 2D translation, rotation, reflection, scaling and shearing
- 5. Use cohen sutherland line clipping and sutherland hodegeman polygon clipping algorithms to find intersection points with the clipping window.
- 6. Understand 3D translation, rotation, reflection, scaling and shearing
- 7. Summarize types of animation, Animation sequence and morphing technique
- 8. Compare RGB, CMY, YIQ, CMYK Color models

## Unit: 1

**Introduction:** Applications of computer graphics, Points, Lines, Pixels and Frame buffer, Primitive operations, Screen grid coordinates, Normalized device coordinates, Line drawing algorithms-DDA, Bresenham's line, Bresenham's circle, Mid-point circle algorithms, Character generation, Line and Text attributes, Antialiasing techniques.

### Unit: 2

**Display Devices:** CRTs, Raster scan systems, Random scan systems, Refresh CRT, Color CRT monitor, DVST (Direct View Storage Tube), Flat panel displays, Graphics input devices: Joystick, Light pen, Tablet and Digitizer.

**Polygon Generation and Filling algorithms:** Types of polygons, Representation of polygons, Entering polygons, Inside-Outside test (odd-even, winding number methods), Scan-line polygon fill, Boundary fill, Flood fill algorithms.

### Unit: 3

**Segments:** Segmentation and Segment tables, Operations on Display file segments, Image ansformation.

**2D Transformations:** Types of transformations- Coordinate transformations, Geometric transformations, Basic transformations- Translation, Scaling, Rotation, Homogeneous coordinates, Compound transformations- Reflection, Shearing, Transformations about arbitrary points & lines.

### Unit: 4

**Windowing and Clipping:** Window, Viewport, Viewing transformation, Clipping-Cohen Sutherland line clipping, Sutherland Hodgeman polygon clipping algorithms.

**3D** Graphics:3D transformations, 3D object representations, Projections- Parallel, Isometric, Perspective viewing, 3D viewing transformation, Hidden surfaces & lines, Back face detection & removal- Z-buffer, Painter's algorithms.

Unit: 6

**Curves:** Introduction, Curve generation, Interpolation, B-spline, B-splines & corners, Bezier curve Algorithm.

**Color models:** RGB, YIQ, CMY, HSV, HLS, Introduction to animation, Morphing, Introduction to Open GL.

# **TEXT BOOKS:**

1. Donald Hearn and M. Pauline Baker [2007], Computer Graphics C Version II edition, Eastern Economy Edition.(1,2,3,4,5,6units)

2. Steven Harrington [2006], Computer Graphics, A programming approach, MGH.(1,2,3 units).

# **REFERENCE BOOKS**

1. David F. Rogers [2008], [II Edition], Procedural elements of Computer Graphics, Tata McGraw Hill Co.

2. Xiang Zhigang and Plastock Roy A [2003], [Schaum's outline of Theory and problems of Computer Graphics, [II Edition], Computer Graphics.

3. W. M. Newman & R. F. Sproull [1997], [II Edition], Principles of Interactive Computer Graphics, Tata McGraw Hill Co.

4. F.S. Hill, Stephen M kelley, Computer Graphics using OPENGL, Third edition, Prentice Hall ,2006.

# NOTE:

**Internal Assessment:** The question paper for Sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### CS210: DATABASE MANAGEMENT SYSTEMS (DBMS) (For B.Tech IV Semester CSE)

Scheme:2013Internal Assessment : 30End Exam:70

L T P C 3 1 0 3

### **End Exam Duration : 3 Hrs**

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Design ER model for a practical Real life system
- 2. Use SQL commands to create, update, modify and retrieve data from the data bases
- 3. Understand the importance of good database design and indexing
- 4. Understand the properties of transactions in a database system
- 5. Analyze concurrency control techniques for handling concurrent transactions
- 6. Understand recovery of data from failures

## Unit: 1

**Introduction:**Purpose of Database Systems, View of Data, Database System Applications, Database Language, Relational Databases, Database Design, object Based and Semi Structured Databases, Data Storage and Querying Transaction Management, Database Architecture, Database users.

**Entity-Relationship Model:** Basic Concepts, Design Issues, Mapping Constraints, Keys, Entity-Relationship Diagrams, Weak Entity Sets, Extended E-R Features, Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.

## Unit: 2

**Relational Model:**Structure, Fundamental Relational Algebra Operations, Additional Relational Algebra Operations, Extended Relational Algebraic Operations, Null Values, Modification of Database, Views.

**Structured Query Language (SQL):**Form of Basic SQL Query, Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries Set, Comparison Operators, Aggregate Operators, Null Values, Comparison, Control Structures, Procedures, functions, Triggers and Cursors in PL/SQL. Using Null values, Logical Connectivity's – AND, OR, and NOT, Impact on SQL Constructs. Outer Joins, Disallowing Null Values.

### Unit: 3

**Relational Database Design:**Features of Good Relational Designs, Atomic Domains and First Normal Form, decomposition using Functional Dependencies, Decomposition using Multivalued Dependencies, Join Dependencies, Domain-Key Normalization Form

**Indexing:**Basic Concepts, Ordered Indices, B Plus Tree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing.

Transactions: Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability.

### Unit: 5

**Concurrency control:**Lock-Based Protocols, Timestamp-Based Protocols, Validation Based Protocols, Multiple Granularity, Multi version Schemes, Deadlock handling, Insert and Delete Operations.

### Unit: 6

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-Volatile Storage, Advanced Recovery Techniques.

#### **TEXT BOOKS:**

1. Henry F. Korth & Abraham Silberschatz [1997], [5 Edition], Data Base System Concepts, MC Graw Hill.(1,2,3,4,5,6units).

#### **REFERENCE** BOOKS:

 C J Date [2008], An Introduction to Data Base Systems, Pearson Education.
 Raghu Ramakrishna and Johnannes Gehrke [2003], [3<sup>rd</sup> Edition], Data Base Management Systems, TATA Mc GrawHill.

3. Elmarsi Ramez and Navrate Shamkant B [2009], Fundamentals of Data Base Systems, Pearson Education.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### CS212: JAVA PROGRAMMING (JP) (For B.Tech IV Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70

**End Exam Duration : 3 Hrs** 

L	Т	Р	С
3	1	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand fundamentals of programming variables, conditional, iterative execution, Arrays, Text File Operations and String operations.
- 2. Implement the basic principles of Object Oriented Programming which includes classes, objects, methods, instance variables, inheritance, polymorphism, encapsulation, abstraction.
- 3. Understand fundamentals of Exception Handling, Packages and Interfaces.
- 4. Understand fundamentals of Multithreading programming, JDBC.
- 5. Develop Graphical User Interface applications in Java by importing applet, AWT, SWING packages, Java's Event Handling Model.

# Unit: 1

**Introduction:**Over view of java, the Java Buzzwords, Data types, Variables and arrays, operators, Control statements, Classes and objects. **I/O**: I/O Basics, Reading Console input, writing Console output, Reading and Writing Files.

**Inheritance**: Basic concepts, uses super, method overriding, dynamic method dispatch, Abstract class, using final, the object class.

# Unit: 2

**String Handling:**String Constructors, Special String Operations-String Literals, String Concatenation, Character Extraction, String Comparisons. Searching Strings, Modifying a string. **String Buffer:** String Buffer Constructors, length(), capacity(), set Length(), Character Extraction methods, append(),insert(),reverse(),delete(),replace(),substring().

# Unit: 3

**Packages and Interfaces:**Packages, Access protection, Importing packages, Interfaces. **Exception Handling**: Fundamentals, Types of Exception, Usage of try, catch, throw throws and finally keywords, built in Exceptions.

# Unit: 4

**Multithreading:**Concepts of multithreading, Main thread, creating thread and multiple threads, Using isAlive() and join(), Thread Priorities, synchronization, Interthread communication.

**Applets:**Applet basics and Applet class.

**Event Handling**: Basic concepts, Event classes, Sources of events, Event listener Interfaces, Handling mouse and keyboard events, Adapter classes.

Abstract Window Toolkit (AWT) - AWT classes, AWT Controls.

# Unit: 6

Java Swings & JDBC:Introduction to Swing: JApplet, TextFields, Buttons, Combo Boxes, Tabbed Panes.

JDBC: Introduction to JDBC

## **TEXT BOOKS:**

1) Herbert Schildt [2008], [5th Edition], The Complete Reference Java2, TATA McGraw-Hill.(1,2,3,4,5,6 Units).

### **REFERENCE BOOKS:**

1) Bruce Eckel [2008], [2nd Edition], Thinking in Java, Pearson Education.

2) H.M Dietel and P.J Dietel [2008], [6th Edition], Java How to Program, Pearson Ed.

3)E. Balagurusamy, Programming with Java: A primer, III Edition, Tata McGraw-Hill, 2007.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### CS214: PRINCIPLES OF DATA COMMUNICATION (PODC) (For B.Tech IV Semester CSE)

Scheme : 2013

Internal Assessment : 30 End Exam : 70 End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

**Course outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand Data Communication Systems, Network models and its Protocols.
- 2. Understand the analog and digital transmission over guided and unguided media.
- 3. Describe Unipolar, Polar, Bipolar line coding schemes and Transmission modes.
- 4. Summarize multiplexing techniques and switching networks.
- 5. Interpret the services of Data link layer.
- 6. Understand ALOHA, CSMA/CA/CD techniques and the Architecture of IEEE 802.11 Architecture.

## Unit: 1

**Introduction:**Data communications, Networks, Protocols and standards, The OSI Model – Layeredarchitecture, Layers in OSI Model, TCP/IP Protocol Suite, Addressing – Physical addresses, Logical addresses, Port Addresses.

## Unit: 2

**Physical layer and Transmission Media:**Analog and digital – Analog and digital data, Analog and digital signals, Digital signals – Bit rate, Bit length, Transmission of digital signals, Transmission Impairments – Attenuation, Distortion and Noise, Performance – Bandwidth, Throughput, Latency, Jitter.Guided Media and Unguided media.

### Unit: 3

**Digital and Analog Transmission:**Digital-to-digital conversion – Line coding schemes, block coding and scrambling, Analog- to-digital conversion – Pulse Code Modulation, Delta Modulation, Transmission modes –Parallel, serial transmissions. Analog-to-analog conversion – Amplitude modulation, Frequency modulation, phase modulation.

# Unit: 4

**Multiplexing and Switching:**Multiplexing – Frequency-division multiplexing, wavelength-division multiplexing, synchronous time-division multiplexing and statistical time-division multiplexing.Switching- Circuit-switched networks, Datagram networks, Virtual circuit networks, Structure of a switch

**Data Link Layer:** Error detection – Introduction, Block coding – error detection, error correction, hamming distance and minimum hamming distance, Cyclic codes, Checksum. Framing, Flow and error control, HDLC, PPP.

### Unit: 6

**Multiple Access and Wired and Wireless LANs:** Random Access – Aloha, CSMA, CSMA/CD, CSMA/CA, IEEE standards, IEEE 802.11 – Architecture, MAC sub layer, Addressing mechanism, physical layer.

### **TEXT BOOKS:**

1.Behrouz A. Forouzan [2006][4<sup>th</sup> Edition], Data communications and Networking, MGH.(1,2,3,4,5,6units).

### **REFERENCE BOOKS:**

1.Andrew S. Tenenbaum [2007], [4<sup>th</sup> Edition], Computer Networks, Pearson Education. 2.William Stallings ,Data and Computer Communications, Seventh Edition or Eighth Edition

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### ML202: SOFT SKILLS (SS) (Common to B.Tech IV Semester ECE & CSE and V Semester CE, EEE & ME Branches)

Scheme : 2013

#### **Internal Assessment : 100**

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Demonstrate the competence to use grammar with an understanding of its basic rules
- 2. Communicate effectively and enhance their interpersonal relationship building skills with renewed self confidence
- 3. Work together in teams and accomplish objectives in a cordial atmosphere
- 4. Face interviews, GDs and give presentations
- 5. Understand and develop the etiquette necessary to present themselves in a professional setting

#### **Course Work**

To achieve the objectives, the following course content is prescribed.

#### Contents

Revision and reinforcement of language skills – grammar – vocabulary Communication Skills – Barriers to Communication – Strategies to overcome the barriers Non Verbal Communication – Body Language – Proxemics – Kinesics Emotional Quotient – self analysis of emotional responses Group Discussions – understanding the objective and skills tested in a GD – types of GDs – roles in a GD – dos and don'ts in a GD Team Work – importance of team work – team vs group – attributes of a successful team – working with groups – dealing with people – group decision making Goal Setting – importance of goal setting – difference between goals and dreams – importance of writing goals – SMART goals – short term goals – long term goals

Time Management – scheduling – how to delegate effectively – plugging time leaks – learning to say "No"

Presentation Skills – Oral Presentations – PPTs – Prepared Speeches – Extempore General Awareness & Current affairs

Business Etiquette – telephone and email etiquette – dining etiquette – dos and don'ts in a formal setting.

#### References

- 1. Stephen R. Covey, "The Seven Habits of Highly Effective People", Pocket Books Publishers, London
- 2. Infosys Campus Connect Portal -//http::campusconnect.infosys.com//
- 3. Shiv Khera, "You Can Win", MacMillan India Publishers, New Delhi
- 4. Stephen R. Covey, A. Roger Merrill and Rebecca R. Merril, "First Things First", Pocket Books Publishers, London
- 5. Gloria J.Galanes, Katherine Adams, John K Brillhart, "Effective Group Discussion: Theory and Practice".
- 6. Priyadarshani Patnaik, "Group Discussion and Interview Skills with VCD", Foundation Books.
- 7. Sangeeta Sharma & Binod Mishra, "Communication Skills for Engineers and Scientists", PHI Learning Private Limited.
- 8. Dr. Shalini Verma, "Body Language- Your Success Mantra", S.Chand, 2006.
- 9. Andrea J. Rutherford, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education, 2007.
- 10. Krishna Mohan and Meera Bajerji, "Developing Communication Skills", MacMillan India Ltd.

### DISTRIBUTION AND WEIGHTAGE OF MARKS

For the Soft Skills subject there shall be continuous tests for 50 marks and viva-voce for 50 marks.

#### EC213: BASIC ELECTRONICS LAB (BE(P)) (For B.Tech IV Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
0	0	2	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Study and analyze the operation of cathode-ray oscilloscope (CRO) for Sinusoidal, Triangular, Square wave forms and phase calculation using lissajous figures.
- 2. Plot the V-I characteristics of PN-Diode, Zener diode to understand their behavior and calculate cut-in voltage, breakdown voltage
- 3. Design half wave and full wave rectifiers with filters, calculate ripple factor and percentage of regulation, and plot the characteristics
- 4. Design Common Base(CB) and Common Emitter (CE) configuration and Characterize the current flow of a bipolar transistor in CB and CE configurations
- 5. Realize Boolean expression using logic gates and design Half adder and Full adder circuit
- 6. Design and realize the truth tables for Multiplexer and Shift register
- 7. Study and analyze the basic operation of Operational Amplifier (OP-AMP-741).

#### List of experiments:

- 1. Study of Electronic equipment CRO, CDS, and FG etc
- 2. Semiconductor Diode Characteristics (p-n diode and Zener diode)
- 3. Half Wave and Full wave Rectifiers
- 4. Transistor Characteristics CE Configuration
- 5. Transistor Characteristics CB Configuration.
- 6. Verification of Logic Gates
- 7. Half Adder and Full Adder
- 8. Multiplexers and Decoders
- 9. Verification of Flip flops
- 10. Shift Register
- 11. Inverting and Non Inverting Amplifier
- 12. Summing and Difference Amplifier

#### CS211: DATABASE MANAGEMENT SYSTEMS LAB (DBMS(P)) (For B.Tech IV Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С	
0	0	2	2	

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Working with the concepts of DDL, DML, DCL Commands
- 2. Design of databases for real life systems using Oracle
- 3. Learning of SQL queries on the real life systems
- 4. Execution of PL/SQL programs for different problems
- 5. Implementation of procedure, function, trigger and cursor concepts in PL/SQL

#### **List of Experiments:**

- 1. Perform DDL, DML and DCL commands.
- 2. Create various tables like Branch, Account, Depositor, Customer, Loan and Borrower for a banking system with constraints using a Schema diagram.
- 3. Design and create a university database consisting of the following tables Department, Course, Instructor and Student, with the help of ER Modeling.
- 4. Design and create a University Library Data base using ER diagram and Schema Diagram.
- 5. Perform various SQL queries on select clause, where clause, pattern matching, Order by, and Group by.
- 6. SQL Queries on Set operations, Aggregate functions and Nested queries. .
- 7. SQL \* plus reports.
- 8. PL/SQL program using control Structures
- 9. Program to implement Procedures
- 10. Program to implement Functions
- 11. Program to implement Cursors
- 12. Program for Triggers

#### CS213: JAVA PROGRAMMING LAB (JP(P)) (For B.Tech IV Semester CSE)

Scheme	: 2013					
<b>Internal Assessment</b>	: 30	]	L	Τ/	Р	
End Exam	:70					
<b>End Exam Duration</b>	: 2 Hrs		0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand fundamentals of programming variables, conditional, iterative execution, Arrays, Text File Operations and String operations.
- 2. Implement the basic principles of Object Oriented Programming which includes classes, objects, methods, instance variables, inheritance, polymorphism, encapsulation, abstraction.
- 3. Understand fundamentals of Exception Handling, Packages and Interfaces.
- 4. Understand fundamentals of Multithreading programming, JDBC.
- 5. Develop Graphical User Interface applications in Java by importing applet, AWT, SWING packages, Java's Event Handling Model.

### List of experiments:

- 1. Implementing classes and Constructors concepts.
- 2. Program to implement Inheritance.
- 3. Program for Operations on Strings.
- 4. Program to design Packages.
- 5. Program to implement Interfaces.
- 6. Program to handle various types of exceptions.
- 7. Program to create Multithreading by extending Thread class.
- 8. Program to create Multithreading by implementing Runnable interface.
- 9. Program for Applets.
- 10. Program for Mouse Event Handling.
- 11. Program to implement Key Event Handling
- 12. Program to implement AWT Controls.

## FOUR YEAR B.TECH. DEGREE COURSE

#### Scheme of Instruction and Examination

#### (Effective from 2013-2014)

#### CSE –V Semester

Scheme: 2013

S. No Cours			Credit	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
	e No.	Course Title	S	L	T/D	Р	End Exam Marks	Internal Assessmen t Marks	Total Mark s
Ι		Theory							
1.	CS301	Computer Networks	3	3	0	0	70	30	100
2.	CS302	Open Source Technologies	3	3	0	0	70	30	100
3.	CS304	Formal Languages and Automata Theory	4	3	1	0	70	30	100
4.	CS305	Web Programming	3	3	0	0	70	30	100
5.	CS307	Software Engineering	3	3	0	0	70	30	100
6.	EC320	Microprocessors & Assembly Language Programming	3	3	0	0	70	30	100
7.	ML203	Business English and Technical Writing	2	1	2	0	-	100	100
II		Practical							
8.	CS303	Open Source Technologies Lab	2	0	0	3	70	30	100
9.	CS306	Web Programming Lab	2	0	0	3	70	30	100
		Total	25	19	03	06	560	340	900

### FOUR YEAR B.TECH. DEGREE COURSE

#### Scheme of Instruction and Examination

### (Effective from 2013-2014)

#### CSE – VI Semester

Scheme: 2013

S. No	Cours	Course Title	Credit	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
	e No.		S	L	T/D	Р	End Exam Marks	Internal Assessmen t Marks	Total Mark s
Ι		Theory							
1.	CS308	Dot Net Technologies	3	3	0	0	70	30	100
2.	CS310	Design and Analysis of Algorithms	3	3	0	0	70	30	100
3.	CS311	Network Programming	3	3	0	0	70	30	100
4.	CS313	Compiler Design	4	3	1	0	70	30	100
5.	CS315	Mobile Computing	3	3	0	0	70	30	100
6.		Inter Disciplinary Elective	3	3	0	0	70	30	100
II		Practical							
7.	CS309	Dot Net Technologies Lab	2	0	0	3	70	30	100
8.	CS312	Network Programming Lab	2	0	0	3	70	30	100
9.	CS314	ALP and CD Lab	2	0	0	3	70	30	100
		Total	25	18	01	09	630	270	900
## FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination

## (Effective from 2013-2014)

## CSE – VII Semester

Scheme: 2013

S. No	Cours		Credit	S Ir per	Scheme of Instruction periods/week		Scheme of Examination Maximum Marks		
	e No.	Course Title	S	L	T/D	Р	End Exam Marks	Internal Assessmen t Marks	Total Mark s
Ι		Theory							
1.	CS401	Object Oriented Analysis and Design	3	3	0	0	70	30	100
2.	CS403	Data warehousing and Mining	3	3	0	0	70	30	100
3.	CS405	Software Project Management	3	3	0	0	70	30	100
4.	CS406	Advanced Computer Architecture	3	3	0	0	70	30	100
5.		Professional Elective - I	3	3	0	0	70	30	100
б.		Global Elective	2	2	0	0		100	100
II		Practical							
7.	CS402	OOAD Lab	2	0	0	3	70	30	100
8.	CS404	Data warehousing Lab	2	0	0	3	70	30	100
9.	CS407	Project Work Preliminary	2	0	0	3	50	50	100
		Total	23	17	00	09	610	290	900

## FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination

## (Effective from 2013-2014)

#### CSE – VIII Semester

Scheme: 2013

S. Course			Credit	Scheme of Instruction periods/week		Scheme of Examination Maximum Marks			
No	No.	Course Title	s L	T/D	Р	End Exam Marks	Internal Assessmen t Marks	Total Mark s	
Ι		<u>Theory</u>							
1.	CS408	Network Security & Cryptography	3	3	0	0	70	30	100
2.	CS409	Big Data & Analytics	3	3	0	0	70	30	100
3.		Professional Elective - II	3	3	0	0	70	30	100
4		Professional Elective -III	3	3	0	0	70	30	100
II		Practical							
5	CS410	Algorithms & Big Data Lab	2	0	0	3	70	30	100
6	CS411	Project Work	6	0	0	6	50	50	100
		Total	20	12	00	09	400	200	600

# CS301: COMPUTER NETWORKS (CN)

## (For B.Tech V Semester CSE)

Scheme	: 2013	Internal Assessment : 30
End Exam	: 70	End Exam Duration : 3 Hrs

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand the terminology and concepts of the OSI reference model and the TCP-IP.
- 2. Understand the topological and routing strategies for an IP based networking infrastructure.
- 3. Understand the congestion prevention and avoidance policies.
- 4. Understand the concepts of Internetworking and determine proper usage of the IP address, subnet mask and default gateway in a routed network.
- 5. Understand connection establishment and services provided by TCP and UDP.
- 6. Understand the working of DNS, SMTP in the global internet.

# Unit: 1

Review of ISO OSI Reference Models, TCP/IP Reference Model.

**Network layer:** Design Issues: store-and-forward, services to transport layer, connection less and connection oriented services, comparison of virtual circuits and datagram subnets.

**Routing Algorithms:** The optimality principle, shortest path routing, Flooding, Distance vector and Link state, Hierarchical, Broadcast and Multicast Routings.

# Unit: 2

**Congestion Control and Quality of Service:** Principles, congestion prevention policies, congestion control in virtual circuits and datagram subnets, load shedding, jitter control. Techniques for achieving good quality of Services.

# Unit: 3

**Internetworking and Network Layer of the Internet :** How Networks differ, How networks connected, concatenated virtual circuits, connection less internetworking, tunneling, Internet work routing, Fragmentation. The IP protocol, IP address, Internet Control protocols, Gateway routing protocols: OSPF, BGP.

# Unit: 4

**Transport Layer :** Services provided to upper layers, service primitives, addressing, establishing a connection, Releasing a connection, flow control, buffering, multiplexing and crash recovery. **UDP:** Introduction, remote procedure call, real time transport protocol.

**Internet Transport Protocols :**TCP- service model, protocol, segment header, connection management, transmission Policy, congestion control and timer management.

# Unit: 6

Application Layer : The DNS Name Space, Resource Records, Name Servers. Electronic Mail: Architecture and Services, User Agent, Message Format, Message Transfer.

# **TEXT BOOKS:**

- 1. Computer Networks, Andrew S.Tanenbaum [4<sup>th</sup> Edition], Pearson Education
- 2. Data communications and Networking, Behrouz A. Forouzan [5<sup>th</sup> Edition] Mc Graw Hill.

# **REFERENCE BOOKS:**

- 1. An Engineering Approach to Computer Networks, S.Keshar, [II Edition], Pearson Education.
- 2. Computer Networking: A Top-Down Approach Featuring the Internet, James F, Keith W.Ross, [V Edition], Pearson Education.
- 3. Computer networks and internets, Douglas E Comer [6<sup>th</sup> Edition], Pearson Education.

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS302: OPEN SOURCE TECHNOLOGIES (OST) (For B.Tech V Semester CSE)

Scheme	: 2013	L	T/D	Р	С
Internal	:30				
Assessment	:70	3	0	0	3
End ExamDuration	: 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand distribution terms of OSS, its importance, FOSS, LAMP bundle server and its benefits
- 2. Illustrate installation of binary packages, basic UNIX commands, backup commands and Redirection operators.
- 3. Describe types of shells, shell variables and keywords, Operations on shell, Decision making and looping statements.
- 4. Exemplify installation of Apache, PHP, Basics of PHP, Flow control statements, Arrays, Strings, Date and Time functions, Forms
- 5. Demonstrate configuration of MYSQL server, MYSQL Tables, MYSQL commands, MYSQL Date and Time functions
- 6. Build a simple android application using Android SDK components

# Unit: 1

**Open Source and Linux**: Open Source Definition, The distribution terms of open source software, open source technology importance, Free and Open Source Software (FOSS), LAMP (Linux, Apache, MySQL, PHP, Python, and perl.), Benefits, Perspectives of Open Source Software.

# Unit: 2

**Introduction to Linux OS:** OS Basics, Linux GUI: Exploring folders, Installation of binary packages, Built in package managers, Introduction to Linux file system, man pages, The first command cat, Command History, Basic Unix commands: vi editior, Redirection operators, basic understanding about uniq, grep, cut, paste, join, tr, df, du, who, rm, unlink, ulimit, chmode, umask, chown, chgrp, id, diff, sed, cmp, comm, Introduction to pipes, backup commands: tar, cpio, zip, and unzip commands, mount and unmount.

# Unit: 3

**Shell Programming:** Types of Shells, Shell script, Shell variables, Shell Keywords, System variables, User defined variables, command line arguments, Arithmetic in shell script, Decision making statements, and the loop control structure.

# Unit: 4

**APACHE AND PHP:** Introduction to Web Server. Installation Apache on Linux: httpd service. PHP: Testing Installation, Basics of PHP Scripts, Variables, Data types, Opeators and Expressions, Constants, Flow Control functions, If statement, Loops, Arrays, Strings, Dates and Times, Forms.

**MySQL SERVER AND APPLICATION MySQL**: Configuring MySQL Server, working with MySQL Databases, MySQL Tables, SQL Commands – INSERT, SELECT, UPDATE, REPLACE, DELETE, Date and time functions in MySQL.

# Unit: 6

Android Tools and Basics: Installing the Android SDK and prerequisites, Test Drive, Components of the SDK, Keeping Up-to-date, Example Code, Building a simple Android Application.

## **TEXT BOOKS:**

- 1. Yashvant kanetkar[2009], [Second Edition], UNIX Shell Programming, BPB Publications
- 2. PHP, MySQL and Apache, Julie C Meloni Pearson Eduction, 2012, [Fifth Edition].
- 3. Programming Android, Orielly Publications, Zigurd Mednieks, Laird Dornin, G. Blake Meike & Masumi Nakamura [2011] [First Edition]

# **REFERENCE BOOKS:**

- 1. N.B. Venkateshwarlu, "Introduction to Linux: Installation and Programming", B S Publishers, 2008, (An NRCFOSS Publication)
- 2. Red Hat Linux Bible Christopher Negus Wiley Publication [2012] [Eighth Edition]

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS304: FORMAL LANGUAGES AND AUTOMATA THEORY (FLAT)

## (For B.Tech V Semester CSE)

Scheme	: 2013				
Internal Assess	ment : 30	L	T/D P	•	С
End Exam	: 70	3	1	0	4
End Exam Dura	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Design of deterministic automata, nondeterministic automata, Moore machine and mealy machine for a given regular language
- 2. Describe the regular expressions and properties of regular languages
- 3. Identify equivalence among regular expression, regular grammar and finite automata
- 4. Design push down automata and context free grammar for any given context free languages
- 5. Understand Turing machines and recursively enumerable languages
- 6. Describe the model of linear bounded automata, properties of recursive languages, primitive, partial recursive functions including halting problem of Turing machine

## Unit: 1

**Finite Automata preliminaries:** Strings, Alphabet, Language Operations, Finite State Machine definitions, Finite Automation Model, Acceptance of strings and languages, Non-deterministic Finite Automation, Equivalence between NFA and DFA, conversion of NFA into DFA, Equivalence between two FSM's, Minimization of FSM, Moore and Mealy machines, Applications of FA's.

# Unit: 2

**Regular Expressions and Regular Sets:** Regular sets, Regular expressions, Identity rules, Manipulation of regular expression, Equivalence between RE and FA, Inter conversion, Pumping lemma, Closure properties of regular sets.

# Unit: 3

**Grammar Formalism:** Regular grammar-Right linear grammar and left linear grammar, Equivalence between regular linear grammar and FA, Inter conversion between RE and RG, Derivation trees, Right most and left most derivation of strings.

**Context Free Grammar:** Context Free Grammar ,Ambiguity in CFG, minimization of CFG, Chomsky Normal Form, Griebach Normal Form, pumping lemma of CFL, LR(K) grammer, properties of LR(K) grammers.

# Unit: 4

**Push Down Automata:** Definition, model acceptance of CFL, Equivalence of CFG and PDA, and interconversion, Properties of CFL.

**Turing Machines:** Turing machine definition, model, design of TM, Computable functions, Recursively enumerable language, Church's hypothesis, Universal Turing machine.

# Unit: 6

**Computability Theory:** Model of Linear Bounded Automation, TM and type0 grammers, LBA and Languages, Halting problem of TM, Primitive recursive functions, Partial recursive functions and TMs.

# **TEXT BOOKS:**

- 1. Hopcroft H.E. and Ullman J.D, [2007], [Third Edition], *Introduction to Automata Theory Languagesand Computation*, Pearson Education.
- 2. Mishra and Chandrashakaran [2008], [Third Edition], *Theory of computer sciences: Automata languages and computation*. PHI.

# **REFERENCE BOOKS:**

- 1. John C Martin [2008], Introduction to languages and the theory of computation, TMH.
- **2.** Peter Linz [2010], [Fourth Edition], *An Introduction To Formal Languages And Automata*, Narosa Book Distributors Pvt. Ltd.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS305: WEB PROGRAMMING (WP)

#### (For B.Tech V Semester CSE)

Scheme	: 2013				
Internal Assess	nent • 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
<b>End Exam Dura</b>	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Create a Web Page Using Physical & Logical Styles of HTML & Text Formatting tags.
- 2. Design a Webpage with hyper links, Images, tables.
- 3. Create Static WebPages Using Frames & Dynamic WebPages using JavaScript
- 4. Design a Form using HTML Forms & Controls.
- 5. Understand the Lifecycle of Servlet & XML Schema.
- 6. Understand the Basic Architecture of JSP & JSP Objects.

## Unit: 1

**Essential HTML:** Introduction, Creating and viewing a web page, immediate solutions. Working with Text: Physical and Logical HTML Styles. Immediate Solutions. Presenting and Arranging Text, Immediate Solutions.

# Unit: 2

**Working with images:** Images in Web pages, Graphic formats, Creating images, Immediate Solutions. Links and Lists: Creating hyperlinks, Creating Image maps, Creating Lists. Creating Tables, Immediate solutions.

# Unit: 3

**Working with Frames:** Creating vertical and horizontal frames, named frames, immediate solutions. Essential JavaScript, Immediate solutions, Putting JavaScript to work, Immediate Solutions.

## Unit: 4

**HTML Forms and HTML Controls:** What's a Form? What Controls are available? Creating a Form and adding HTML Controls, Submitting Data from forms, Immediate Solutions. Dynamic HTML: Dynamic Styles, Dynamic content and Data Binding.

## Unit: 5

**Essential XML:** valid and well-formed XML documents, XML Document Type Definitions, XML Schemas. Immediate solutions. Java Beans Components: Why Beans, The Bean Writing Process, Using Beans to build an application. Introduction to Servlet- Servlet Life Cycle, Example, Servlet Classes.

**JSP Overview:** How JSP works, Basic Example, JSP syntax and semantics: The JSP development model Components of a JSP Page, a Complete Example, Scriptlets Handling by the JSP Container, Implicit Objects and the JSP Environment, Initialization parameters. Declarations. Request Dispatching: Anatomy Of Request Processing, including other resources, the <jsp: include> action, the request dispatcher Object.

## **TEXT BOOKS:**

- 1. Steven Holzner [2008], HTML Black Book. Dream Tech Press Unit I, II, III, IV, V.
- 2. Cay S.Horstman, Gary cornell [2008], [8th Edition] Core Java TM 2 Volume II Advanced Features , Pearson Education, Unit V.
- 3. Phil Hanna [2003], JSP 2.0 Complete Reference, Tata McGraw Hill (Unit -VI)

## **REFERENCE BOOKS:**

- 1. Patrick Naughton, Herbert Schildt [2008], [Fifth Edition], The Complete Reference Java2, Tata McGraw Hill
- 2. Kim Keogh [2005], J2EE Complete Reference, Tata McGraw Hill

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## CS307: SOFTWARE ENGINEERING (SE) (For B.Tech V Semester CSE)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration: 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the phases of software development life cycle and Process models
- 2. Demonstrate Requirement Engineering process and Change management
- 3. Understand the design concepts, design classes and design model
- 4. Exemplify architectural styles and patterns in architectural design
- 5. Explain White box testing and Black box testing techniques
- 6. Use Risk Mitigation Monitoring Management plan to avoid Risks
- 7. Understand Software Quality Assurance activities and Quality standards

# Unit: 1

**Introduction To Software Engineering And Process Models:** The Evolving role of software, Changing nature of software, Software myths.

Software Engineering: A Layered Technology, A Process Framework.

**Process Models:** The Waterfall model, Incremental process models, Evolutionary process models, The Unified process.

# Unit:2

**Software Requirement and Requirement Engineering Process:** Functional and Nonfunctional requirements, User requirements, System requirements, The Software requirements document. **Requirement Engineering Process:** Feasibility studies, Requirements elicitation and Analysis, Requirement validation, Requirement Management.

# Unit: 3

**Design** -Design process and Design quality, Design concepts: Abstraction, Information Hiding, Functional Independence, Refactoring, Modularity, Refinement, Design Classes, Design Model.

## Unit: 4

**Creating an Architectural Design :**Software Architecture, Data Design- Data Design at architecture level, Data Design at component level, Architectural Styles & Patterns. Architectural design.

# Unit: 5

**Testing & Metrics:** Testing Strategies-A Strategic approach to Software testing, Test strategies for Conventional software, White Box Testing- Basis Path Testing, Control Structure Testing, Black Box Testing, Validation Testing, System Testing, The art of Debugging.

Metrics for Process & Products - Software Measurement, Metrics for software quality.

**Risk Management:** Risk Management- Reactive vs. Proactive risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM plan.

**Quality Management:** Quality Management- Quality Concepts, Software quality assurance, Software reviews, Formal technical reviews, Statistical software quality assurance, Software reliability, The ISO 900 quality standards.

## **TEXT BOOKS:**

- 1. Sommerville [2008], [7th Edition], Software Engineering, Pearson education.
- 2. Roger S.Pressman [2005], [7th Edition], *Software Engineering, A Practitioner's Approach*, Mc Graw Hill International Edition.

## **REFERENCE BOOKS:**

- 1. K.K.Agarwal&Yogesh Singh [2008], *Software Engineering*, New Age International Publishers.
- 2. James F.Peters, Witoldpedecz, John Wiely [2008], *Software Engineering-an Engineering approach*.
- 3. Shely Cashman Rosenblatt [2006], System Analysis and Design, Thomson Publications.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### EC320: MICROPROCESSORS & ASSEMBLY LANGUAGE PROGRAMMING (MALP)

#### (For B.Tech V Semester CSE)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand 8085 microprocessor and its architecture.
- 2. Understand assembly language programs by using 8085 microprocessor instruction set and addressing modes.
- 3. Understand 8086 assembly language programming.
- 4. Understand modular programming and interfacing devices.

# Unit: 1

**Introduction to Microprocessors:** Microprocessor Architecture and its operations, Memory, Input and Output (I/O) devices.

8085 Microprocessor: Architecture, Registers

**Introduction to 8085 Assembly Language programming:** The 8085 programming model. Instruction classification, Instruction and Data format, Addressing modes.

# Unit: 2

Procedure to write Assembly Language Programming.

**Introduction to 8085 Instructions:** Data transfer operations, Arithmetic operations, Logical operations, Branch operations.

**Programming techniques with Additional Instructions:** Looping, Counting and Indexing. Additional Data transfer and 16 bit arithmetic Instructions, Arithmetic operations related to memory, Logical operations: Rotate & Compare, some simple programs.

## Unit: 3

**8086** Architecture: CPU Architecture, Internal operation, Machine Language Instructions: Addressing modes, Instruction formats, Instruction execution timing.

## Unit: 4

Assembler language programming: Assembler Instruction format, Data transfer Instructions, Arithmetic Instructions: Binary arithmetic, Packed & unpacked BCD arithmetic, Branch Instructions, Loop Instructions, Logical Instructions, Shift and Rotate Instructions, Byte and string manipulation, Directives and operators.

# Unit: 5

**Modular programming:** Linking and Reallocation, Stacks, Procedure, Interrupts and Interrupt routines, Macros, basic concepts of I/O programming.

**Interfacing devices:** Architecture and operation of : Programmable Communication Interface (PCI)(8251), Programmable Peripheral Interface (PPI)(8255), Programmable Interval Timer(8254/53), DMA controller(8257).

# **TEXT BOOKS:**

- 1) RAMESH GAONKAR, "Microprocessor Architecture, Programming, and Applications with the 8085", [Fifth Edition], PENRAM Publications. [2008].
- 2) A.K. RAY & K.M. BURCHANDI, "Advanced Microprocessors and Peripherals", 2/e, TMH, [2000].
- 3) YU-CHENG LIU, GLENN A.GIBSON, "Microcomputer Systems: The 8086/8088 Family", TMH EDITION, [2007].

# **REFERENCE BOOKS:**

- 1. Barry B.Brey [2005], The Intel Microprocessors, Prentice-Hall.
- 2. Douglas V.Hall [2006], [second edition]," MICROPROCESSRS AND INTERFACING", TATA MCGRAW-HILL EDITION.

## NOTE:

**Internal Assessment:** The question paper for Sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

#### ML203: BUSINESS ENGLISH AND TECHNICAL WRITING (BETW)

#### (Common to B.Tech IV Semester CIVIL, EEE & ME and V Semester ECE & CSE Branches)

# Scheme: 2013 Internal Assessment : 100Duration of Exam: 3 Hrs

L	T/D	Р	С
1	2	0	2

The purpose of this course is to help the students enhance their proficiency in oral and written communication in English to enable them to use English effectively at the corporate workplaces with global presence.

#### **Course Outcomes:**

The Student will be able to:

- 1. Use grammatically acceptable English
- 2. Demonstrate all aspects of language skills for a successful professional career
- 3. English effectively in interpersonal and professional contexts
- 4. Write technical content effectively
- 5. Handle business correspondence effectively

#### **Course Work**

To achieve the objectives, the following course content is prescribed for the Business English and Technical Writing Laboratory Sessions.

#### Contens

Revision of grammar and vocabulary:

- articles, prepositions, tenses, concord
- voices, reported speech, sentence types
- synonyms, antonyms, one word substitutes, idioms, collocations
- word making, affixes, commonly used foreign words, words often confused
- jumbled sentences and jumbled paragraphs
- common errors in English pertaining to both grammar and vocabulary (TOEFL type) Reading Comprehension – practice tests

Listening Comprehension – practice tests

Speaking skills with focus on correct pronunciation

Writing Cover Letters for Job Applications/ Resume Preparation/ Statement of Purpose for Internships, Apprenticeships, Admissions in Universities, etc.

Writing Technical Reports/ Proposals/Formats of Research Articles, Journal Papers, Project Reports

Email writing

Writing Business Letters/ Formats of Letters, Block Letters/Memos

#### References

- 1. Raj N Bakshi, "English Grammar Practice", Orient Longman.
- 2. Sangeeta Sharma & Binod Mishra,"Communication Skills for Engineers and Scientists", PHI Learning Private Limited.
- 3. Marilyn Anderson, Pramod K.Naya and Madhucchanda Sen, "Critical Reasoning, Academic Writing and Presentation Skills", Pearson Publishers.
- 4. M. Ashraf Rizvi, "Effective Technical Communication", Tata McGraw-Hill Publishing Company Ltd., 2005.

5. Raymond V. Lesikar, Marie E. Flatley, "Basic Business Communication: Skills for Empowering the Internet Generation", 11th Edition, Tata McGraw-Hill. 2006.

- 6. Dr A. Ramakrishna Rao, Dr G.Natanam & Prof S.A.Sankaranarayanan, "English Language Communication: A Reader cum Lab Manual", Anuradha Publications, Chennai, 2006.
- 7. Dr. Shalini Verma, "Body Language- Your Success Mantra", S.Chand, 2006.

8. Andrea J. Rutherford, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education, 2007.

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

#### **Business English and Technical Writing Examination:**

For Business English and Technical Writing subject, there shall be continuous PC based evaluation during the semester for 80 marks and viva voce to be conducted by an external examiner for 20 marks.

# CS303: OPEN SOURCE TECHNOLOGIES LAB (OST(P)) (For B.Tech V Semester CSE)

Scheme	: 2013
Internal Assessment	:30
End Exam	:70
End Exam Duration	: 3 Hrs

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Illustrate installation of binary packages, basic UNIX commands, backup commands and Redirection operators.
- 2. Describe Shell Programming, Decision making and looping statements.
- 3. Exemplify installation of Apache, PHP, Basics of PHP, Flow control statements, Arrays, Strings, Date and Time functions, Forms
- 4. Demonstrate configuration of MYSQL server, MYSQL Tables, MYSQL commands, MYSQL Date and Time functions
- 5. Build a simple android application using Android SDK components

## List of Experiments:

- 1. Installation of Linux
- 2. Use of various commands
- 3. Use of Text Processing Tools : grep, cut,
- 4. Back up using tar
- 5. C/C++ program using cc / gcc
- 6. Configuring Apache
- 7. PHP script for sorting the marks
- 8. PHP scripts for other tasks
- 9. MySQL Installation, Configuration and Testing
- 10. Design of admission form using PHP MYSQL
- 11. Install Eclipse for Android.
- 12. Build small Applications using Android

# CS306: Web Programming Lab (WP(P))

#### (For B.Tech V Semester CSE)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration: 2 Hrs

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Use various text formatting tags, images, tables to design Web pages.
- 2. Design HTML forms Using HTML Forms and Controls.
- 3. Design Dynamic web pages and bind two web pages using DHTML concepts.

#### List of Experiments:

- 1) Design an application using Text formatting Tags.
- 2) Design an application using <img> element with all attributes.
- 3) Design an application using Links and Lists.
- 4) Design an application using Client-side Image maps.
- 5) Design an application using <TABLE>element withall attributes.
- 6) Design an application using <FRAME> element with all attributes.
- 7) Design an application using HTML Forms and Controls.
- 8) Simple programs using Java Script.
- 9) Write a program to implement Dynamic Styles and Dynamic Content.
- 10) Write a program to implement Data binding using Data source Controls (MSHTML, TDC).
- 11) Write a program to implement Java Beans.
- 12) Write a program to implement Servlets.

# CS308: DOT NET TECHNOLOGIES (DNT)

## (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Illustrate the usage of loops, conditional statements, Arrays, Collections and Generics using console based applications.
- 2. Explain inheritance, polymorphism using classes, objects and interfaces.
- 3. Understand the working of Menus, Button, Label, Radio Button, Checkbox, Text Box, List Box, Checked List Box, List View and Tab Control using Windows applications.
- 4. Compare the features of SDI and MDI applications using windows forms.
- 5. Explain the process of writing insert, update ,delete and select statements using ADO .NET
- Understand the creation, validation and post back mechanisms of an ASP page using ASP

   .NET

# Unit: 1

**Introduction to C#:** .NET Framework, What is C#, Writing a C# program, Variables and Expressions, Flow control - Branching & Looping.

## Unit: 2

**Control Structures in C#:** Type conversion – Implicit & Explicit, Complex variable types – Arrays, Structures & Enumerations, Functions, Error handling.

## Unit: 3

**Introduction to OOP using C#:** OOP Techniques – Inheritance, Polymorphism, Interfaces, Events, Defining classes, Defining class members – Member definitions, Collections, Generics – Using generics.

# Unit: 4

**Basic windows programming:** Controls – Button, Label, LinkLabel, TextBox, RadioButton, CheckBox, RichTextBox, ListBox, CheckedListBox, ListView, TabControl.

## Unit: 5

Advanced windows programming: Menus, Toolbars, Single Document Interface (SDI) and Multiple Document Interface (MDI) applications, Building MDI applications, Creating controls.

**Introduction to ADO.NET and ASP.NET: ADO.NET** - Data Access components, Database programming with SQL SERVER, **ASP.NET** – ASP.NET Runtime, Creating a simple page, Server controls, ASP.NET Postback, ASP.NET AJAX Postback, Authentication and Authorization.

## **TEXT BOOKS:**

- 1. Harsh Bhasin, Programming in C#, Oxford University Press 2014, New Delhi.
- 2. Karli Watson, Christian Nagel, Jacob Vibe Hammer, Jon D. Reid, Morgan Skinner, Daniel Kemper, Beginning Visual C# 2012 Programming, Published by John Wiley & Sons, Inc.,
- 3. Dan Clark, Beginning C# Object Oriented Programming, New York, 2013, 2nd edition.

## **REFERENCE BOOKS:**

- 1. John Sharp, Microsoft Visual C# 2013 Step by Step, Microsoft Press, Washington, 2013.
- 2. E Balaguruswamy, Programming in C#, Tata McGraw-Hill Publisher 2010, New Delhi, 3<sup>rd</sup> Edition.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS310: DESIGN AND ANALYSIS OF ALGORITHMS (DAA)

#### (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand time, space complexities, notations, Divide and conquer technique to solve problems.
- 2. Understand greedy method to solve knapsack, MCST, Tree vertex split and Job sequencing with deadline problems.
- 3. Describe Tree and graph traversals with complexities, bi-connected components and articulation points in a graph.
- 4. Understand Dynamic programming technique to solve shortest path, knapsack, TSP, OBST and reliability design problems.
- 5. Understand Backtracking technique to solve n-queens, graph coloring, Hamiltonian cycle's problems.
- 6. Understand branch & bound techniques (FIFO, LIFO, LC search) for TSP and 15-puzzle problem and Lower Bound Theory.

# Unit: 1

**Introduction:** What is an Algorithm? Performance Analysis: Space & Time Complexities, Asymptotic notation.

**Divide and Conquer** :- General method, Binary search, Finding Maximum and Minimum, Merge sort, Quick sort, Strassen's Matrix Multiplication.

## Unit: 2

**Greedy Method** : The General Method, Knapsack Problem, Job Sequencing with Deadlines, Minimum-Cost Spanning Trees, Optimal Storage on Tapes, Optimal Merge Patterns, Single Source Shortest Paths, Tree Vertex Problem.

## Unit: 3

**Basic Traversal and Search Techniques** :- Techniques for Binary Trees, Techniques for Graphs, Biconnected Components and DFS.

## Unit: 4

**Dynamic Programming :** The General Method, Multistage Graphs, All Pairs Shortest Paths, Optimal Binary Search Trees, 0/1-Knapsack, Reliability Design, The Travelling Salesperson Problem, String Editing problem .

#### Unit: 5

**Backtracking:** The General Method, The 8-Queens Problem, Sum of Subsets, Graph Coloring, and Hamiltonian cycles.

**Branch and Bound :** The Method, 15 Puzzle problem, Travelling Salesperson **Lower Bound Theory :** Comparison Trees, Oracles and Adversary arguments, Techniques for Algebraic problems.

## **TEXT BOOKS:**

1. Ellis Horowitz, Sartaz Sahni & Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, Galgotia Publications Second Edition.

## **REFERENCE BOOKS:**

1. Jon Kleinberg, Eva Tardos, Algorithm Design, Pearson Education Seventh Impression.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS311: NETWORK PROGRAMMING (NP)

## (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand Inter Process communication mechanisms in UNIX such as pipes, fifos, message queues, RPC Mechanism
- 2. Acquire Knowledge on OSI Layers, TCP connection establishment and its importance in internet applications
- 3. Use Elementary TCP Socket Functions(socket, connect, bind, listen, accept, close) in Network Programming
- 4. Understand the background mechanism for Normal start-up and Termination in TCP Client Server
- 5. Comprehend the role of I/O Multiplexing and socket Options in implementing robust client server applications
- 6. Use UDP socket functions and its applications in Network Programming

## Unit: 1

**IPC :** Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores, rlogin Overview, RPC Transparency Issues.

## Unit: 2

**Introduction to Network Programming:** OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

## Unit: 3

**Sockets :** Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

#### Unit: 4

**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: 5

**I/O Multiplexing and socket options:** I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option, IPV6 socket option.

**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, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

## **TEXT BOOKS:**

**1.UNIX Network Programming**, Vol. I, Sockets API, 2nd Edition. - W.Richard Stevens, Pearson Edn. Asia.

2. UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

## **REFERENCE BOOKS:**

1.UNIX Systems Programming using C++ T CHAN, PHI.

2. UNIX for Programmers and Users, 3rd Edition Graham GLASS, King abls, Pearson Education

3. Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS313: COMPILER DESIGN (CD)

## (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3 Hrs

L	T/D	Р	С
3	1	0	4

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the phases of compiler and compiler construction tools
- 2. Identify tokens in the source program using lexical analyzer technique
- 3. Understand parsing table using top down and bottom up parsing techniques
- 4. Explain type checking and storage allocation strategies
- 5. Describe three address code and code optimization techniques
- 6. Understand code generator, flow graph and DAG representation

#### Unit: 1

**Compilers:** Basic function of Language translator, differences between compiler and interpreter, logical phase of a compiler, difference between pass and phase, grouping the phases into passes, compiler construction tools.

#### Unit: 2

**Lexical Analysis:** The role of lexical analyzer, input buffering, specifications of tokens, recognition of tokens, a language for specifying lexical analyzers, design of a lexical analyzer generators.

#### Unit: 3

**Syntax Analysis**: Top-Down Approach: Role of parser, parsing, top down parsing, recursive decent parsing, predictive parsers, non recursive predictive parsing, bottom up parsing, operator precedence parsing, LR parser.

#### Unit: 4

**Semantic Analysis:** Typical semantic errors, type checking, type conversions, specification of a simple type checker, equivalence of type expressions, storage allocations, strategies of storage allocation, static, dynamic and heap.

#### Unit: 5

**Intermediate Code Generation:** Intermediate code languages, three address code, types of three address code, syntax directed translation into three address code, implementations of three address statements - quadruples, triples, indirect triples

**Code Optimization:** Introduction to code optimization, principles sources of optimization, optimization of basic blocks, peephole optimization.

## Unit: 6

**Code Generation:** Issues in the design of code generator, the target machine, basic blocks and flow graphs, a simple code generator, DAG representation of basic blocks, generating code from DAGs.

## **TEXT BOOKS:**

1. Alfred V.Aho, Ravi Sethi, Jeffrey and D.Ullman [2014], Compilers Principles, Techniques and tools, Pearson edition.

2. John J. Donovan [2008], Systems Programming, Tata McGraw-Hill Edition.

## **REFERENCE BOOK:**

1. Trembly & Sorenson [2007], Theory & practice of compiler writing, MC GrawHill.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# **CS315: MOBILE COMPUTING (MCP)**

## (For B.Tech VI Semester CSE)

Scheme	: 2013	L	T/D	Р	С
Internal Assess	nent : 30		0	•	
End Exam	: 70	3	0	0	3
<b>End Exam Dura</b>	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the basic concepts of wireless communication & mobile computing
- 2. Learning about wireless medium access controlling mechanisms : SDMA, FDMA, TDMA, CDMA
- 3. Understand the basic concepts of GSM, System Architecture, Protocol Architecture, Handovers, DECT and TETRA.
- 4. Understand the WLAN System Architecture, Protocol Architecture, Physical Layer, Mac Management
- 5. Acquiring knowledge on the structure & concepts of Mobile IP ,Encapsulation Methods, DHCP
- 6. Get knowledge about Traditional TCP and Classical Improvements of TCP

#### Unit: 1

**Wireless transmission**: Frequencies for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems

## Unit: 2

**Medium access control**: Motivation for a Specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison of S/T/F/CDMA.

## Unit: 3

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

DECT: System architecture, Protocol architecture, TETRA.

## Unit: 4

**Wireless LAN**: Infrared Vs Radio Transmission, Infra Red and ad-hoc network, IEEE 802.11: System architecture, Protocol architecture, Physical layer.

IEEE 802.11: Medium access control layer, MAC management, 802.11b, 802.11a.

**Mobile IP**: Goals & requirements, Entities and terminology, IP Packet delivery, Agent discovery, Registration, Tunneling & encapsulation, Optimizations, Reverse tunneling, IPv6, IP micro- mobility support, Dynamic host Configuration protocol.

## Unit: 6

**Traditional TCP**: Congestion control, Slow start, Fast retransmit/fast recovery, implications of mobility, Classical TCP improvements.

## **TEXT BOOKS:**

1. Jochen Schiller [2008], [Second Edition], *Mobile Communications*, Low price edition, Pearson Education.

## **REFERENCE BOOKS:**

1. Talukder [2008], Mobile Computing: Technology, Applications & service creation, TMH.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS309:DOT NET TECHNOLOGIES LAB (DNT(P))

#### (For B.Tech VI Semester CSE)

Scheme	: 2013				
		L	T/D	Р	С
Internal Assess	nent : 30				
End Exam	: 70	0	0	3	2
End Exam Dura	ation : 3Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement arrays, structures, inheritance and collections using console based applications.
- 2. Demonstrate the usage of buttons, textbox, labels, radio buttons, menus, context menus and MDI using windows applications.
- 3. Execute insert, update, delete and select statements in ADO.NET using MS Access, SQL server.
- 4. Create an ASP page and validate the controls using ASP.NET features

#### List of Experiments:

- 1. Create a Console Based Application to implement Arrays concept.
- 2. Create a Console Based Application to implement Structures concept.
- 3. Create a Console Based Application to implement Inheritance concept.
- 4. Create a Console Based Application to implement the concept of Collections.
- 5. Create a Window Based Application to display the day of the desired date.
- 6. Create a Window Based Application to simulate Online Examination.
- 7. Create a Window Based Application to simulate ATM machine.
- 8. Create a Window Based Application to simulate Menus.
- 9. Create a Window Based Application to simulate MDI.
- Create a Window Based Application to retrieve and insert the records into the database using SQL SERVER.
- 11. Web Application to perform Data Entry and Validation.
- 12. Web Application to perform Data Base Connectivity Using Data Grid View.

# CS312: NETWORK PROGRAMMING LAB ( NP(P) )

#### (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3Hrs

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement Inter process communication concepts in UNIX programming using Pipes, FIFOs, Message Queues and semaphores
- 2. Use TCP Sockets functions to develop Client Server applications
- 3. Develop Client Server applications using UDP Sockets functions
- 4. Building robust client-server applications using I/O Multiplexing and Socket Options

#### List of Experiments:

- 1. Implementing the Pipes.
- 2. Implementing FIFO.
- 3. Implement file transfer using Message Queue form of IPC.
- 4. Write a program to implement day time client & server.
- 5. Implementation of Chatting Application.

6. Write a program to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use semaphores to avoid race conditions.

7. Design TCP iterative Client and server application to reverse the given input sentence.

- 8. Design TCP client and server application to transfer file.
- 9. Implementation of the Concurrent Servers.
- 10. Design UDP client and server application to transfer file.

11. Design UDP iterative Client and server application to reverse the given input sentence.

12. Design using select client server application to multiplex TCP and UDP requests for reversing input sequence.

#### CS314: ASSEMBLY LANGUAGE PROGRAMMING & COMPILERS LAB (ALP(P))

#### (For B.Tech VI Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3Hrs



Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement DFA's in high level languages
- 2. Develop lexical analyzer
- 3. Determine simplified grammar for a given left recursion grammar
- 4. Construction of predictive parser for a context free grammar

#### List of Experiments:

- 1. Conversion from Infix to Postfix.
- 2. Evaluation of Postfix expression.
- 3. a. DFA accepting a string ending with two 0's.
  - b. DFA accepting a string starts with two 1's.
  - c. DFA accepting a string with odd number of 0's.
  - d. DFA accepting a string with even number of 1's.
- 4. Implement LEXICAL ANALYZER.
- 5. Elimination of Left Recursion and Left factor the Grammar.
- 6. Implementing Predictive Parser.
- 7. ALP for Linear Search.
- 8. ALP for Matrix Addition.
- 9. ALP for Bubble Sort.
- 10. ALP for sum of 'n' numbers.

# CS401: OBJECT ORIENTED ANALYSIS & DESIGN (OOAD)

#### (For B.Tech VII Semester CSE)

Scheme	: 2013	L	T/D	Р	С
Internal Assess	ment : 30	Ľ	112	-	U
End Exam	: 70	3	0	0	3
<b>End Exam Dura</b>	ation : 3 Hrs		•		

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the concepts of object oriented system, unified approach.
- 2. Understand object oriented system development, methodologies.
- 3. Demonstrate UML diagrams.
- 4. Identify use cases, classes, attributes and methods.
- 5. Develop access layer classes using axioms and corollaries.
- 6. Model user interface and map object oriented system to relational system.

#### Unit: 1

Rational Rose S/W: Introduction, Working with Rational Rose Environment.

An overview of Object Oriented System development –Introduction, Overview of the unified approach.

**Object basics:** Objects, classes, state and properties, behavior and methods, messages, encapsulation and information hiding, Class hierarchy, polymorphism, relationships and associations, aggregation and containment, object identity, static and dynamic binding, persistence, Meta –classes.

#### Unit: 2

**Object Oriented Systems Development Life Cycle** – The software development process, Object Oriented Systems development: A use case driven approach, Reusability.

Object Oriented Methodologies-Rumbaugh methodology, Booch methodology,

Jacobson methodology, Patterns, Unified approach, Layered approach.

**Unified Modeling Language(UML)** –Introduction, UML class diagrams, Use-case diagram, Interaction diagram, sequence diagram, Collaboration diagram.

#### Unit: 3

State chart diagram, Activity diagram, component diagram, deployment diagram, packages. UML extensibility –Model constraints, note, stereotype, UML Meta model.

**Object Oriented Analysis Process: Identifying Use Cases-** Introduction, Business Object analysis, use-case driven object oriented analysis: unified approach, use-case model, developing effective documentation, case studies.

## Unit: 4

**Object Analysis:** classification theory, Noun Phrase approach, use-case driven approach, classes, responsibilities and collaborators, naming classes.

**Identifying Object Relationships, Attributes and Methods** – Associations, super and subclass relationships, A-part-of relationship, class responsibilities, Object responsibility: Methods and messages, case studies.

## Unit: 5

**Object Oriented Design Process and Design Axioms** – Object Oriented design Axioms, corollaries, design patterns.

**Designing Classes**: Introduction, philosophy, class visibility, refining attributes, designing methods and protocols, Packages and Managing Classes.

Access Layer: Object store and persistence, DBMS, logical and physical database organizations and access control, client-server computing.

## Unit: 6

Distributed objects computing, Object Relational systems, multi database systems, designing access layer classes.

**View Layer**: User interface design, designing view layer classes. Macro-level process, micro-level process, UI design rules, view layer interface.

## **TEXT BOOKS:**

1. Ali Bahrami – Irwin [1999], *Object Oriented systems development*, McGraw. (1,2,3,4,5,6 Units).

## **REFERENCE BOOKS:**

- 1. Grady Booch, James Rambaugh, Ivar Jacobson [1998], UML User Guide, Addison Wesley.
- 2. Jason T. Roff [2006], UML a Beginner's Guide, TATA McGraw-Hill.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS403: DATA WAREHOUSING & MINING (DWM)

#### (For B.Tech VII Semester CSE)

Scheme	: 2013	т	тл	D	C
Internal Assess	ment : 30	L	1/D	r	C
End Exam	: 70	3	0	0	3
End Exam Dura	ation : 3 Hrs	5		U	5

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the data warehouse business process and managers.
- 2. Identify components that are required to meet the Data Warehouse architecture.
- 3. Design a Data Warehouse using multiprocessor architecture.
- 4. Understand data ware house schemas for multidimensional data models.
- 5. Determine predictions on Multi dimensional Data Bases using OLAP tools.
- 6. Understand the conceptual steps involved in data mining in solving business problems.

#### Unit: 1

**Introduction to system process:** Delivery Process, System Process – Process flow, Extraction and Loading of Data, Clean and Transform Data, Backup and Query Management process. Process Architecture – Various types of Managers.

#### Unit: 2

**Datawarehousing components:** Overall Architecture, Data warehouse database, Sourcing, Acquisition Cleanup and Transformation Tools, Meta Data, Access tools, Data Marts, Data warehouse Administration and Management, Information Delivery system.

#### Unit: 3

**Building a data warehouse :**Business considerations, Design considerations, Technical considerations, Benefits of data warehousing. Mapping Data warehouse to Multiprocessor Architecture.

#### Unit: 4

**DBMS Schemas for decision support :**Data layout for best access, Multidimentional data model, Star schema, Star Join and Star Index, Bitmapped Indexing.

#### Unit-5

**Reporting and query tools :**Reporting Tools, Managed Query Tools, Executive Information system Tools, OLAP Tools, Data Mining Tools. OLAP – Need for OLAP, Guidelines, Categorization.

#### Unit-6

**Patterns and models** :Where and What of a Model, Sampling, Experimental Design. **DATA MINING :**Introduction, Decision Trees – What and where How of Decision Trees, Nearest Neighbour and Clustering.

#### **TEXT BOOKS:**

- 1. Sam Anahory and Dennis Murray [2008], "Data Warehousing in the Real World", Pearson Education.
- **2.** Alex Berson, Stephen J. Smith [2008], "*Data Warehousing, Data Mining & OLAP*", Tata McGraw–Hill Publications.

#### **REFERENCE BOOKS:**

- 1. Jiawei Han, Micheline Kamber, Elsevier [2008], "Data Mining concepts and techniques".
- 2. Margaret H. Dunham, S. Sridhar [2003], "*Data Mining Introductory and Advanced Topics*", Pearson Education.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## **CS405: SOFTWARE PROJECT MANAGEMENT**

#### (For B.Tech VII Semester CSE)

Scheme	: 2013				
		L	T/D	Р	С
Internal Assess	nent : 30				
End Exam	: 70	3	0	0	3
End Exam Dura	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the Processes, Project Management, Capability Maturity Model and Project Planning Infrastructure.
- 2. Define standard process, process tailoring and change management process.
- 3. Estimate effort of software project using bottom-up, top-down and use case points approach.
- 4. Understand Quality Concepts, Quantitative Quality Management Planning and Defect Prevention Planning.
- 5. Describe risk management activities, measurements and project tracking.
- 6. Explain project management plan, review process, and project monitoring.

#### Unit: 1

**Managing Software Projects:** Processes and Project, Project Management and the CMM, Overview of the CMM, KPAs for project management, Project Management at Infosys, SEPG support to projects, Senior Management Involvement in project, The project management process, Case study.

#### Unit: 2

**Project Planning:** The project planning infrastructure, the process database, a sample entry, The process capability baseline, Process assets and the body of knowledge system. Process Planning: The standard process, process tailoring, Tailoring for short duration project, Requirement change management, Change management process, Examples ,Case study.

## Unit: 3

**Effort Estimation and scheduling**: Effort estimation models, estimation schedule, Effort estimation approaches, the bottom up estimation approach, top down estimation approach, the use case points approach, case study, Scheduling, the effectiveness of the approach.

## Unit: 4

**Quality planning:** Quality concepts, Procedural approach to quality management, Quantitative approaches to quality management, Quantitative quality management palnning, Estimating defects for other stages, Quality process planning, Defect prevention planning, The quality plan for a project.

#### Unit: 5

**Risk Management**: Concepts of Risks and Risk Management, Risk Assessment, Risk Identification, Risk Control, Risk Management planning, Examples, Case Study, Measurement and Tracking planning, metrics and measurement, Process monitoring through statistical process control, Measurement, Logging and tracking defects, Measuring schedule.
**The project management plan:** Team structure, communication, issue resolution, configuration management, concepts, configuration management process, status monitoring and audits, Reviews, Data collection, Group review summary report, NAH syndrome.

## **TEXT BOOKS:**

1.Pankaj Jalote, "Software project management in practice", Springer, Universities Press.

## **REFERENCE BOOKS:**

Sommerville [2008], [7<sup>th</sup> Edition], *Software Engineering*, Pearson education.
Roger S.Pressman [2005], [6<sup>th</sup> Edition], *Software Engineering, A Practitioner's Approach*, Mc GrawHill International Edition.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS406: ADVANCED COMPUTER ARCHITECHTURE (ACA)

## (For B.Tech VII Semester CSE)

Scheme	: 2013				
		L	T/D	Р	С
Internal Assessm	ent: 30				
End Exam	: 70	3	0	0	3
End Exam Dura	tion : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the parallel processing in parallel computer structures, parallel classification schemes and memory hierarchy in parallel processing systems.
- 2. Understand the working of nonlinear pipelines using Reservation tables, instruction and Arithmetic pipelines.
- 3. Apply the Principles of designing pipeline processors: Instruction prefetch and branch handling, Data buffering and busing structures, internal forwarding and register tagging, Hazard detection and resolution, Job sequencing and collision prevention.
- 4. Understand SIMD array processors and interconnection networks.
- 5. Design multistage networks based on the characteristics of multiprocessor systems and interconnection networks.
- 6. Determine the importance of Data Flow computers over control flow computers and stack computers.

## Unit: 1

**Introduction to parallel processing:** Trends towards parallel processing, parallelism in uniprocessor systems, parallel computer structures, architecture classification schemes, parallel processing Applications, memory hierarchy in parallel processing systems.

## Unit: 2

**Pipelining:** pipeline concept, linear pipelining and space time diagram, classification of pipeline processor, nonlinear pipeline and reservation table, instruction and arithmetic pipelines.

## Unit: 3

**Principles of designing pipeline processors**-instruction prefetch and branch handling, data buffering and busing structures, internal forwarding and register tagging, hazard detection and resolution, job sequencing and collision prevention.

## Unit: 4

**SIMD Array Processors**: SIMD structures and algorithms for array processors, organization, masking and routing mechanisms, inter processor communication, parallel algorithms for array processors(matrix multiplication and parallel sorting)

**SIMD interconnection network**: single stage and multistage network, cube network, barrel shifter, shuffle exchange and omega networks.

## Unit: 5

**Multiprocessor architecture:** Loosely coupled and tightly coupled multiprocessor systems, processor characteristics, interconnection network, timeshared or common busses, crossbar switch and multi port memories, multistage network.

**Data flow computers:** control flow Vs data flow, data flow computer architectures, , data flow graphs and languages, data flow and design alternatives-dependency driven approach and multi level driven approaches.

**Stack computers:** Stacks, arithmetic evaluation stacks, control stacks, storage for simple and structured variables, the parameter preparation stack.

## **TEXT BOOKS:**

1. Kai Hwang, Faye Briggs [1993], Computer architecture and parallel processing, MC GRAW HILL.

2. Stone Harolds [1995], Introduction to computer architecture, Galgotia.

## **REFERENCE BOOKS:**

1. Kai Hwang [1993], Advanced computer architecture, MC GRAW HILL.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS402: OBJECT ORIENTED ANALYSIS AND DESIGN LAB ( OOAD(P) )

#### (For B.Tech VII Semester CSE)

Scheme	: 2013				
Internal Assess	nent : 30	L	T/D	Р	С
End Exam	: 70	0	0	3	2
End Exam Dura	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

1. Develop UML diagrams for case studies using Rational Rose tool.

### List of Experiments:

- 1. Introduction to unified modeling language (UML).
- 2. Mini Project1: Elevator problem.
- 3. Mini Project2: Online book shop.
- 4. Mini Project3: library system.
- 5. Mini Project4: ATM system.
- 6. Mini Project5: Student Information System.
- 7. Mini Project6: Vending Machine.
- 8. Mini Project7: Graphics Editor.
- 9. Mini Project8: Payroll Systems.
- 10. Implementation of Case Studies.

# CS404: DATA WAREHOUSING LAB (DW (P))

#### (For B.Tech VII Semester CSE)

Scheme : 2013

	$\mathbf{L}$	T/I	) P	C
Internal Assessment : 30	_		_	-
End Exam : 70	0	0	3	2
End Exam Duration : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement data warehouse using Open Data Sources.
- 2. Use Code Reusability in mappings.
- 3. Apply Conversion techniques of one Data base file format to another file format.

#### **List of Experiments**

- 1. Understanding Source Qualifier and Implementing it.
- 2. Implementation of Filter Transformation.
- 3. Implementation of Aggregations transformation.
- 4. Implementation of Expressions Transformation.
- 5. Implementation of Rank Transformation.
- 6. Implementation of Joiner Transformation.
- 7. Implementation of Constraint Based Loading.
- 8. Implementation of Merging.
- 9. Implementation of sorting using sorter Transformation.
- 10. Implementation of Sequence generator Transformation.
- 11. Transforming the Data from XML to DATABASE.
- 12. Transforming the Data from FIXED FLAT FILE to DATABASE.
- 13. Transforming the Data From DELIMITED FILE to DATABASE.

# CS407: PROJECT WORK PRELIMINARY LAB (For B.Tech VII Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Formulate a real world problem and develop with requirements
- 2. Survey of the current state work in the specified area
- 3. Identify the gaps in the existing system and to design new solution to fill the gaps
- 4. Determination of methodologies used in the past studies of the same or similar topic
- 5. Acquire practical knowledge within chosen area of technology for project development
- 6. Contribute as an individual or as a team member in the development of technical project

# CS408: NETWORK SECURITY & CRYPTOGRAPHY (NSC)

### (For B.Tech VIII semester CSE)

Scheme Internal Assessment	: 2013 : 30	L	T/D	Р	С
End Exam End Exam Duration	: 70 : 3 Hrs	3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the importance of security, active and passive attacks on information in the network.
- 2. Describe conventional cryptographic techniques DES and AES.
- 3. Explain the purpose of public and private keys in security algorithms for encryption and decryption of data.
- 4. Define the security concepts to develop highly secure algorithms using MAC and Hash functions.
- 5. Compare Cryptographic Hash Algorithms MD5 and SHA-1
- 6. Understand the design principles of security Models and their applications

#### Unit: 1

**Introduction to Security:** Services, Mechanisms and Attacks, Security Services, A model for network security, Internet standards and RFC's. Symmetric cipher model, permutation, transposition, substitution techniques.

#### Unit: 2

**Conventional Cryptography :**Block cipher principles, Fiestal structure, Simplified DES, DES (including double DES, Triple DES), The Strength of DES, AES, Block Cipher modes of Operation.

## Unit: 3

**Public Key Cryptography:** Principles of Public Key Cryptosystems, Private Key Vs Public key cryptography, RSA Algorithm. Key Management, Diffie- Hellman Key Exchange algorithm.

## Unit: 4

**Message Authentication and Hash Functions:** Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions.

#### Unit: 5

**Hash Algorithms:**MD5 Message Digest Algorithm, Secure Hash algorithm: SHA-1, Comparison of SHA-1 and MD5.

#### Unit: 6

**Digital Signatures:** Digital Signatures, Digital Signature Standard (DSS), Kerberos, X.509 Authentication Service.

#### **TEXT BOOKS:**

- 1. William Stallings, Cryptography and Network Security: Principles and Practices, Pearson Education, 6<sup>th</sup> Edition, 2013.
- 2. William Stallings, Network Security Essentials: Applications and Standards, Pearson Education, 5<sup>th</sup> Edition, 2013

#### **REFERENCE BOOKS:**

- 1. Fundamentals of Computer Security, Springer.
- 2. Network Security: The Complete Reference, Robert Bragg, Mark Rhodes, TMH.
- 3. Principles of Information Security Whitman, Thomson.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS409: BIG DATA & ANALYTICS (BDA)

#### (For B.Tech VIII Semester CSE)

Scheme : 2013

		L	T/D	Р	С
<b>Internal Assessm</b>	ent : 30	3	0	0	3
End Exam	: 70				
End Exam Dura	ion : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Recognize the need for change in processing due to Big Data.
- 2. Understand the impact of Big Data in Digital Marketing, Fraud, Algorithmic Trading, Risk Management and HealthCare.
- 3. Classify the Predictive Analytics, Crowd Sourcing Analytics, Inter and Trans Firewall Analytics.
- 4. Understand the R and Hadoop Working environment.
- 5. Explain Web Page Categorization, Stock Market Frequency Change Computation and Bulldozers blue book sale price prediction –Data Analytics Problems.

# Unit: 1

#### Introduction

What Big Data is, How data is changing, Shift in Processing due to Big Data, Changing focus with Big Data, Role of Data Analyst,

## Unit: 2

## **Foundation of Big Data**

Industry examples of Big Data: Digital marketing and non-line world, Big Data and the marketing. Fraud and Big Data, Credit Risk Management, Big Data and algorithmic Trading, Big Data and Advances in Health care.

## Unit: 3

## **Big Data Technology**

Hadoop's Parallel World, Data Discovery, Open Source Technology for Big Data Analytics, The cloud and Big Data, Predictive Analytics, Crowd Sourcing Analytics, Inter and Trans Firewall Analytics.

## Unit: 4

## R & Hadoop

Understanding the features of RStudio, performing data modeling in R, Understanding different Hadoop modes, Understanding Hadoop features, Learning HDFS and MapReduce architecture.

## Unit: 5

## Hadoop MapReduce

Understanding the basics of MapReduce, Introducing Hadoop MapReduce, Hadoop MapReduce fundementals. Hadoop MapReduce Example, different ways to write hadoop MapReduce in R.

# Data Analytics with R and Hadoop

Understanding the data analytics project life cycle, understanding data analytics problems- exploring web pages categorization, computing the frequency of stock market change, predicting the sale price of blue book for bulldozers-case study.

## **TEXT BOOKS:**

1) Big Data Analytics, By Michael Wessler, OCP & CISSP. John Wiley & Sons, Inc. 2013.

2) Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses by Michael Minelli, Michele Chambers, Ambiga Dhiraj : John Wiley & Sons 2013.

3) Big Data Analytics with R and Hadoop, Vignesh Prajapati: PACKT Publishing. 2013.

## **REFERENCE BOOKS:**

1) Data Science & Big Data Analytics: Discovering, Analyzing, Presenting Data Visualizing.

2) Hadoop: The Definitive Guide, 3rd Edition, By Tom White, O'reilly Media

3) Big Data Now: 2012 Edition Publisher: O'Reilly Media.

4) Too Big to Ignore: The Business Case for Big Data (Wiley and SAS Business Series) By Phil Simon, Wiley 1e.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS410: ALGORITHMS & BIG DATA LAB (ABD(P))

#### (For B.Tech VIII Semester CSE)

Scheme	: 2013				
Internal Assess	nent : 30	L	T/D	Р	С
End Exam	: 70	0	0	3	2
End Exam Dura	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Implement Knapsack, Single Source Shortest Path, All Pairs Shortest Path and Travelling Sales Person Problems.
- 2. Compute Arithmetic, Logical operations Vectors, Lists, Data Frames In R.
- 3. Demonstrate installation procedure of R Studio & Hadoop in Ubuntu.
- 4. Implement Mapper & Reducer classes in Hadoop environment.

#### List of Experiments:

- 1. Implementation of the sorting and searching techniques using divide and conquer method.
- 2. Implementation of single source shortest path using greedy method.
- 3. Implementation of greedy knapsack problem
- 4. Implementation of all pairs shortest path using dynamic programming.
- 5. Implementation of knapsack problem using backtracking.
- 6. Implementation of travelling salesperson problem.
- 7. Installing R Studio.
- 8. Installing Hadoop on Linux.
- 9. Installing Cloudera Hadoop on Ubuntu.
- 10. Perform various Hadoop shell commands.
- 11. Implement MapReduce job.
- 12. Monitor and Debug Hadoop MapReduce job.

#### CS411: PROJECT WORK LAB (PWP(P)) (For B.Tech VIII Semester CSE)

Scheme: 2013Internal Assessment : 30End Exam: 70

L	T/D	Р	С
0	0	3	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Analyze, formulate and handle programming projects with a comprehensive systematic approach
- 2. Develop a design solution for a set of requirements
- 3. Test and validate the conformance of the developed prototype
- 4. Generate alternative solution, compare them and select the optimum one
- 5. Develop effective communication skills for the presentation of project related activities and able to document the work
- 6. Identify one's need for further knowledge and continuously develop one's own competencies

S.No	Course Name	Course Code
1.	Cloud Computing	CS412
2.	Middleware Technologies	CS413
3.	Pattern Recognition	CS414
4.	Information Retrieval System	CS415
5.	Parallel and Distributed Algorithms	CS416

# **Professional Electives-II**

S.No	Course Name	Course Code
1.	Introduction to Mainframe Systems	CS417
2.	Natural Language Processing	CS418
3.	Design Patterns	CS419
4.	Distributed Operating System	CS420
5.	Client Server Computing	CS421

# **Professional Electives-III**

S.No	Course Name	Course Code
1	Internet Protocols	CS422
11		00122
2.	Sensor Networks	CS423
3.	Advanced Database Management Systems	CS424
4.	Soft Computing	CS425
5.	Bio Informatics	CS426

# CS412: CLOUD COMPUTING (CC) (PROFESSIONAL ELECTIVE-I)

Scheme	: 2013				
		L	T/D	Р	C
<b>Internal Assess</b>	ment : 30	3	0	0	3
End Exam	: 70				
<b>End Exam Dur</b>	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Define the features, layers and types of clouds.
- 2. Explain the use of virtualization and provisioning of resources in cloud.
- 3. Illustrate the thread, task and map reduce programming models using Aneka tool.
- 4. Summarize the cloud computing features implemented in Google, Amazon, Microsoft, IBM and Cisco.
- 5. Understand the process of developing cloud applications in Amazon and Microsoft.
- 6. State the best practices to be followed for the future of cloud computing.

#### Unit: 1

**Introduction to Cloud Computing:** Roots of Cloud Computing, Layers and Types of Clouds, Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Opportunities.

## Unit: 2

**Virtualization and Resource Provisioning in Clouds:** Introduction and Inspiration, Virtual Machines (VM), VM Provisioning and Manageability, VM Migration Services, VM Provisioning in the Cloud Context, and Future Research Directions.

## Unit: 3

**Programming Enterprise Clouds using Aneka:** Introduction, Aneka Architecture, Thread Programming using Aneka. Task Programming: using Aneka, MapReduce Programming using Aneka.

#### Unit: 4

**Cloud computing with Titans:** Google: Google app engine, Google web toolkit, EMC: Technologies, VMWare Acquisition, NetApp: Offerings, CISCO partnership, Microsoft: Azure services platform, windows live, Exchange online, sharepoint services, Microsoft Dynamic CRM.Amazon: Amazon EC2, Amazon simpleDB, Amazon S3, Amazon front cloud, Amazon SQS, Amazon Book store, Salesforce.com: force.com, CRM, App Exchange, IBM:services, movements to cloud, security, Partnerships.

**Cloud Applications and Development:** Integration of private and public clouds, GrepTheWeb on Amazon cloud, ECG.

**Google:** Payment, force.com and Google, Google gears, Microsoft: Live services, Microsoft SQL services, Microsoft.Net services, Microsoft SharePoint services, Dynamics CRM services. Development

## Unit: 6

**Best Practices and the future of cloud computing:** Analyze your service, Best Practices, How cloud computing might Evolve?

## **TEXT BOOKS:**

1. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, Cloud Computing: Principles and Paradigms, ISBN-13: 978-0470887998, Wiley Press, New York, USA, February 2011.

2. "Cloud Computing: A Practical Approach" by Toby Velte, Anthony Velte, Robert Elsenpeter. McGraw-Hill, Inc. New York, NY, USA ©2010 ISBN:0071626948 9780071626941.

## **REFERENCE BOOKS**:

1. Rajkumar Buyya, Chee Shin Yeo, Srikumar Venugopal, James Broberg, and Ivona Brandic, "CloudComputing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the5th Utility", Future Generation Computer Systems, Volume 25, Number 6, ISSN: 0167-739X,Elsevier Science, Amsterdam, The Netherlands, June 2009.

2. Suraj Pandey, William Voorsluys, Sheng Niu, Ahsan Khandoker, and Rajkumar Buyya, "AnAutonomic Cloud Environment for Hosting ECG Data Analysis Services", Technical Report, CLOUDS-TR-2010-4, Cloud Computing and Distributed Systems Laboratory, The University of Melbourne, Australia, August 3, 2010.

Note: The question paper shall consist of Eight questions with ONE question from each Unit. The student shall answer any FIVE questions.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions

# CS413: MIDDLEWARE TECHNOLOGIES (MWT)

## (PROFESSIONAL ELECTIVE-I)

Scheme : 2013

		•	U
3	0	0	3
	3	3 0	3 0 0

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand 2-tier, 3-tier, N-tier architectures.
- 2. Understand the middleware technologies like COM,CORBA.
- 3. Identify the essential services of COM and CORBA.
- 4. Learn about the IDL of COM ,IDL of CORBA.
- 5. Create and destroy COM and CORBA objects.
- 6. Learn the techniques of bridging COM and CORBA.

## Unit: 1

**The arrival of distributed objects:** Client/Server beginnings,2- tier,3 -tier and N-tier Architecture, Communicating between tiers, Managing Distributed Systems.

The Dominance of COM and CORBA : The Distributed Objects Landscape, The Dominant Component Architecture(COM), The Dominant Remote Architecture(CORBA), Evolutionary Trends.

#### Unit: 2

**Distributed Object Fundamentals :** An Overview of the Fundamentals, A Distributed Object Example, Demonstrating the Fundamentals-Selecting Data Types, Defining Interfaces-COM IDL and Type Libraries ,CORB IDL, Proxies, Stubs, Skeletons-COM Proxies and Stubs, COM Type Library Marshalling, CORBA Stubs and Skeletons, Implementing the Servers

## Unit: 3

**Implementing the clients:** Using IDL in COM C++ Client, Using a Type Library in COM VB Client, Using IDL in Orbix CORBA C++ Client, VisiBroker CORBA Java Client, Object Handles-COM Interface Pointers in C++&VB,CORBA Object References in C++ & Java Creating Objects, Invoking Object Methods, Destroying Objects-Destroying COM Objects & CORBA Objects.

## Unit: 4

**COM and CORBA on the server :** Accessing the Server Side ,Strategic directions of COM and CORBA- COM:A Vertical Strategy, CORBA: A Horizontal Strategy, The Need for an Assessment strategy, Assessment Criteria-Platform Criteria, Essential Services, Intangibles

## Unit: 5

**Essential Services:** Service Criteria, Distributed Transaction Support, Distributed Security-DCOM Security, MTS Security ,CORBA and the Secure Sockets Layer, CORBA Security Service, Messaging Support-COM and Microsoft Message Queue Server, CORBA and Messaging Support Distributed Object Management-Need for Stateless Objects, COM Object Management, CORBA Object Management

**COM and CORBA on the Client:** The Desktop Client - Dominance of COM on the Desktop, COM Client Approaches-Custom Interfaces, Automation Interfaces, Dual Interfaces, Installing remote COM clients, COM Development Environments-The VB COM Client, VJ++ COM Client, VC++ COM Client

**Bridging COM and CORBA:** Customer Bridging Approaches - Overview of Bridging Examples, Using C++ to bridge COM and CORBA. COM/CORBA Inter Working specification, A Commercial Bridging Example

# **TEXT BOOK:**

1. JASON PRITCHARD, PhD [2008], COM and CORBA side by side Architectures, strategies and implementations, Pearson education Asia.

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# **CS414: PATTERN RECOGNITION (PR)**

# (PROFESSIONAL ELECTIVE-I)

Scheme	: 2013				
Internal Assess	nent : 30	L	T/D	Р	С
End Exam End Exam Dura	: 70 ation : 3 Hrs	3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. implement basic pattern recognition algorithms.
- 2. apply performance evaluation methods for pattern recognition.
- 3. select appropriate techniques for addressing recognition problems.
- 4. summarize current pattern recognition research verbally and in writing.
- 5. learn pattern recognition using hidden markov models.
- 6. Bayesian Decision Theory and how different classification methods define decision boundaries.

#### Unit: 1

**Introduction:** Definition of Pattern Recognition, Data Sets for Pattern Recognition, Different Paradigms for Pattern Recognition

#### Unit: 2

**Representation:** Data Structures for Pattern Recognition, Representation of Clusters, Proximity Measures, Size of Patterns, Abstractions of the Data Set, Feature Extraction, Feature Selection, Evaluation of Classifiers, Evaluation of Clustering.

## Unit: 3

**Nearest Neighbor based Classifiers:** Nearest Neighbor Algorithm, Variants of NN Algorithm, Use of Nearest Neighbor Algorithm for Transaction Database, Efficient Algorithms, Data Reduction, and Prototype Selection.

## Unit: 4

**Bayes Classifier:** Bayes Theorem, Minimum Error Rate Classifier, Estimation of Probabilities, Comparison with NNC, Naïve Bayes Classifier, Bayesian Belief Network

#### Unit: 5

**Hidden Markov Models:** Markov Models for Classification, Hidden Markov Models, and Classification using HMMs.

#### Unit: 6

**Decision Trees:** Introduction, Decision Trees for Pattern Classification, Construction of Decision Trees, Splitting at the Nodes, Overfitting and Pruning, Examples of Decision Tree Induction

## **TEXT BOOKS:**

1.M.Narasimha Murthy and V.Susheela Devi, "Pattern Recognition An Algorithmic Approach", Springer, Universities Press.

## **REFERENCE BOOKS:**

1.Sergios. Theodoridis," Pattern Recognition ", Fourth Edition Hardcover – November 3, 2008 2.William Gibson,"Pattern Recognition", Berkley, edition2005.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# **CS415: INFORMATION RETRIEVAL SYSTEMS (IRS)**

## (PROFESSIONAL ELECTIVE-I)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the range of methods used to organize the information
- 2. Retrieve information, Understand how information has changed over time.
- 3. Understand the concepts, importance of information surrogates, related concepts of access points, indexing to facilitate effective organization and retrieval of information.
- 4. Get an indepth knowledge of information retrieval system, indexing and clustering mechanism.
- 5. Understand the concept of information visualization, evaluation and retrieval of information.

#### Unit: 1

**Introduction:** Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Information Retrieval System Capabilities - Search, Browse, Miscellaneous.

#### Unit: 2

## **Cataloguing and Indexing**

Objectives, Indexing Process, Automatic Indexing, Information Extraction.

**Data Structures:** Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

## Unit: 3

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

**Document and Term Clustering:** Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

## Unit: 4

**User Search Techniques:** Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

**Information Visualization**: Introduction, Cognition and perception, Information visualization technologies.

Unit: 5

**Text Search Algorithms:** Introduction, Software text search algorithms, Hardware text search systems.

**Information System Evaluation:** Introduction, Measures used in system evaluation, Measurement example – TREC results.

**Multimedia Information Retrieval:** Models and Languages, Data Modeling, Query Languages, Indexing and Searching.

Libraries and Bibliographical Systems: Online IR Systems, OPACs, Digital Libraries.

## **TEXT BOOKS:**

- 1. Information Storage and Retrieval Systems: Theory and Implementation By Kowalski, Gerald, Mark T Maybury Kluwer Academic Press, 2000.
- 2. Modern Information Retrival By Ricardo Baeza-Yates, Pearson Education, 2007.

# **REFERENCE BOOKS :**

- 1. Information Retrieval Data Structures and Algorithms By William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
- 2. Information Storage & Retieval By Robert Korfhage John Wiley & Sons.
- 3. Introduction to Information Retrieval By Christopher D. Manning and Prabhakar Raghavan, Cambridge University Press, 2008.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS416: PARALLEL AND DISTRIBUTED ALGORITHMS (PDA)

## (PROFESSIONAL ELECTIVE-I)

Scheme	: 2013				
Internal Assess	nent : 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
<b>End Exam Dura</b>	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Learn parallel and distributed algorithms development techniques for shared memory and message passing models.
- 2. Understand the main classes of parallel algorithms.
- 3. Demonstrate the complexity and correctness models for parallel algorithms.
- 4. Understand parallel algorithms and their analysis.
- 5. Learn basic principles and possibilities of algorithm parallelization.

#### Unit: 1

**Parallel Computers:** Basic Techniques, Parallel Computers for increase Computation speed, Parallel & Cluster Computing.

#### Unit: 2

**Message Passing Computing**: Message Passing Technique- Evaluating Parallel programs and debugging, Partitioning and Divide and Conquer strategies examples.

## Unit: 3

Pipelined Computations: Pipelining- Techniques computing platform, pipeline programs examples.

## Unit: 4

**Synchronous Computations:** Synchronous Computations, Partially Synchronous Methods, load balancing, distributed termination and detection algorithms, distributed terminations examples.

## Unit: 5

**Programming With Shared Memory:** Shared memory multiprocessor constructs for specifying parallelism sharing data, parallel programming languages and constructs, open MP.

#### Unit: 6

## **Distributed Shared Memory Systems and Programming:**

Distributed Shared Memory Systems and Programming, Achieving constant memory distributed shared memory programming primitives, Algorithms – sorting and numerical algorithms.

#### **TEXT BOOKS:**

- 1. "Parallel Programming", Barry Wilkinson, Michael Allen, Pearson Education, 2ndEdition.
- 2. "Introduction to Parallel algorithms", by Jaja from Pearson, Addison-Wesley, 1992.

#### **REFERENCE BOOK:**

1. "The Design and Analysis of Parallel Algorithms", by Selim G.AKL Published *1989 by* Prentice-Hall International.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# **CS417: INTRODUCTION TO MAINFRAME SYSTEMS (IMS)**

#### (PROFESSIONAL ELECTIVE-II)

Scheme	: 2013				
Internal Assess	ment : 30	L	T/D	Р	С
End Exam	:70	3	0	0	3
End Exam Dur	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand Evolution of Mainframe Hardware
- 2. Understand Mainframe OS, Z- Operating system and its features.
- 3. Learn Job control language and IBM utility programs.
- 4. Understand DB2, its objects and datatypes.
- 5. Gain knowledge in COBOL programming.
- 6. Understand Mainframe Application Development Guidelines

## Unit: 1

**Evolution of Mainframe Hardware:** Overview of Computer architecture -Classification of computers -micro, mini, mainframes and super computer, Mainframe computer - key features, benefits, Evolution of Mainframes, Different hardware systems.

**Mainframes OS and Terminology:** Operating systems on Mainframes, Batch processing vs. Online processing. Mainframe operating system: evolution - concepts of address space, Buffer management, Virtual storage, Paging, Swapping, Dataset management in mainframes.

## Unit: 2

**Z/OS and its features:** Z-operating system (Z/OS) - Virtual storage, Paging process, Storage managers, Program execution modes, Address space, Multiple virtual system(MVS), MVS address space, Z/OS address space, Dataset- Sequential and Partial dataset, Direct access storage device(DASD), Access methods, Record formats, Introduction to Virtual storage access methods(VSAM) - Catalog – VTOC.

## Unit: 3

**Overview of JCL:** Introduction to Job Control language, Job processing, Structure of JCL statements, Various statements in JCL- JOB statement, EXEC statement, DD statement. JCL procedures and IBM utility programs.

**Overview of DB2:** Introduction to DB2 - System Service component, Database Service component, Locking Service component, Distributed Data Facility Services component, Stored Procedure component, Catalogs and Optimizer.

**DB2** Objects and Data Types : DB2 objects hierarchy, Storage groups, Database, Table space, Table, Index, Clustered index, Synonyms and aliases, Views, Data Types, DB2 SQL programming - Types of SQL statements, DCL, DDL, DML, SPUFI utility. Embedded SQL programming – Host variable, DECLGEN utility, SQLCA, Single/multiple row manipulation, Cursors, Scrollable cursors.

# Unit: 5

**COBOL Programming:** COBOL program Structure, Language Fundamentals, Data division, Procedure division, File Processing, File handling verbs.

# Unit: 6

# Mainframe Application Development Guidelines:

COBOL coding standards, relation between a COBOL file handling program and JCL, Different types of ABEND codes, COBOL-DB2 program pre-compilation, DBRM (Database Request Module), Application plan/packages, Program execution methods (EDIT JCL, foreground and background modes).

# **TEXT BOOKS:**

- 1. Gary DeWard Brown, JCL Programming Bible (with z/OS) fifth edition, Wiley India Dream Tech 2002.
- 2. COBOL Language Reference, Ver 3, Release 2, IBM Redbook.
- 3. M.K. Roy and D. Ghosh Dastidar, "Cobol Programming", Tata McGraw Hill, NewYork, 1973.

# **REFERENCE BOOKS :**

- 1. MVS JCL, Doug Lowe, Mike Murach and Associates
- 2. z/OS V1R4.0 MVS JCL Reference found online at http://www-1.ibm.com/support/docview.wss?uid=pub1sa22759706
- 3. Nancy Stern & Robert A Stern, "Structured Cobol Programming", John Wiley & Sons, New York, 1973.
- 4. IBM Manual: DB2 SQL Reference. http://publib.boulder.ibm.com/infocenter/db2v7luw/index.jsp

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS418: NATURAL LANGUAGE PROCESSING (NLP)

#### (PROFESSIONAL ELECTIVE-II)

Scheme	: 2013				
Internal Assessn	ent : 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
End Exam Dura	tion : 3 Hrs				

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand how to perform intelligent tasks on natural language.
- 2. Understand, analyze and generate written text.
- 3. Understand both knowledge-based and statistical approaches to NLP and provide insight into many open research problems.
- 4. Analyze sentences in terms of parts of speech (POS) and constituent structure, including the use of tree diagrams.
- 5. Understand the practical problems in natural language processing that can be solved using statistical techniques.

## Unit: 1

**Introduction to Natural Language Understanding:** The study of Language, Applications of Natural Language Understanding, Evaluating language Understanding Systems, The different Levels of Language Analysis, Representations and Understanding.

## Unit: 2

**Morphology and Finite-State Transducers:** Survey of English Morphology, Finite-State morphological parsing.

**Computational Phonology and Text-to-Speech:** Speech Sounds and Phonetic Transcription, The phoneme and phonological Rules, Phonological Rules and Transducers, Machine learning of Phonological Rules.

## Unit: 3

**N-grams:** Counting words in corpora, simple (unsmoothed) N-grams, smoothing, back off, Deleted Interpolation, N-grams for spelling and Pronunciation, entropy.

#### Unit: 4

**HMMs and Speech Recognition:** Speech Recognition Architecture, Overview of Hidden Markov models, The Viterbi Algorithm Revisited, Advanced method for decoding, Acoustic Processing of Speech. computing Acoustic Probabilities, Training a Speech Recognizer.

## Unit: 5

**Grammar and Parsing:** grammars and sentence structure, what makes a good grammar A top-Down Parser, A Bottom-Up Chart Parser, Transition Network Grammar.

**Featured and Augmented Grammars:** Feature Systems and Augmented Grammars, some basic featured systems for English, Morphological Analysis and the lexicon, A simple grammar using Features, parsing with features.

**Natural Language Generation:** Introduction to Language Generation, An Architecture for generation, Surface Realization, Discourse planning.

# **TEXT BOOKS:**

- 1. "Speech and Language Processing": Jurafsky and Martin, Pearson Education Second Edition
- 2. "Natural Language Understanding". James Allen, Pearson Education Second Edition.

## **REFERENCE BOOKS:**

- 1. Cover, T. M. and J. A. Thomas: Elements of Information Theory. Wiley.
- 2. Charniak, E.: Statistical Language Learning. The MIT Press.
- 3. Lutz and Ascher "Learning Python", O'Reilly

## NOTE:

**Internal Assessment:** The question paper for Sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS419: DESIGN PATTERNS (DP)

## (PROFESSIONAL ELECTIVE-II)

Scheme	: 2013				
Internal Assess	nent : 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
End Exam Dura	ntion : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the usage of design patterns for solving object oriented design problems.
- 2. Explain the patterns used in solving design problems of Lexi Document Editor.
- 3. Describe the creational patterns abstract factory, factory method, builder, prototype, singleton.
- 4. Understand structural patterns adapter, bridge, composite.
- 5. Understand structural patterns decorator, facade, fly weight, proxy.
- 6. Explain behavioural patterns chain of responsibility, command, interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

## Unit: 1

**Patterns:** Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.

## Unit: 2

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: 3

**Creational Patterns:** Abstract Factory, Builder, Factory Method, Prototype, Singleton, and Discussion of Creational Patterns

Unit: 4 Structural Pattern Part-I: Adapter, Bridge, and Composite

Unit: 5

Structural Pattern Part-II: Decorator, facade, Flyweight, Proxy.

## Unit: 6

Behavioral patterns Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

## **TEXT BOOKS:**

1. Erich Gamma [2008], Design Patterns elements of reusable object oriented software, Pearson Education.

#### **REFERENCE BOOKS:**

- 1. Mark Grand, Pattern's in JAVA Vol-I, Wiley DreamTech.
- 2. Mark Grand, Pattern's in JAVA Vol-II, Wiley DreamTech.
- 3. Mark Grand [2006], JAVA Enterprise Design Patterns Vol-III, Wiley DreamTech.
- 4. Eric Freeman-Oreilly-spd, Head First Design Patterns.
- 5. Alan Shalloway, Design Patterns Explained, Pearson Education.

#### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# **CS420: DISTRIBUTED OPERATING SYSTEM (DOS)**

## (PROFESSIONAL ELECTIVE-II)

Scheme: 2013Internal Assessment : 30End Exam: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the goals, design issues and communication scenarios of a Distributed System.
- 2. Describe synchronization problems and deadlocks in distributed systems
- 3. Understand the Concept of threads and scheduling in distributed systems.
- 4. Classify the system models, Processor Allocation algorithms.
- 5. Understand the File System and shared memory concepts in Distributed Systems.
- 6. Explain the basic concepts of AMOEBA Operating system.

#### Unit: 1

**Distributed Operating System: Goals, Hardware Concepts**-Bus Based Multiprocessors, Switched Multiprocessors, Bus Based Multicomputers, Switched Multicomputers.

Software Concepts: Network Operating Systems, True Distributed Systems, and

Multiprocessor Timesharing Systems.

Design Issues: Transparency, Flexibility, Reliability, Performance, Scalability.

#### Unit: 2

**Communication in Distributed Systems Client-Server Model**: Clients & Servers, addressing, blocking Vs non blocking primitives, buffered Vs unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model.

**Remote Procedure Call**: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues.

Group Communication: Introduction, design issues, Group Communication in ISIS.

#### Unit: 3

**Synchronization in Distributed Systems Clock Synchronization:** Logical clocks, physical clocks, clock synchronization algorithms, use of synchronized clocks.

**Mutual Exclusion:** Centralized algorithm, distributed algorithm, token ring algorithm, **Election Algorithm:** Bully Algorithm, ring algorithm.

Atomic Transactions: Introduction, transaction model, implementation, concurrency control, **Dead Locks:** Distributed deadlock detection and prevention.

# **Processes And Processors in Distributed Systems**

**Threads-**Introduction, threads usage, design issues, implementing a threads package, threads and RPC. **System Models-**Workstation model, using idle workstations, processor pool model, hybrid model. **Processor allocation-**Allocation models, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms.

# Unit: 5

**Distributed File System Design:** File service interface, directory service interface, semantics of file sharing.

**Implementation:** File usage, system structure, caching, replication. **Trends in Distributed File System**.

# Unit: 6

**Case Study: Amoeba** 

Introduction, objects and capabilities: Capabilities, object protection, standard operations.

Memory Management: Segments, Mapped Segments.

**Communication in AMOEBA:** Remote Procedure Call, Group Communication, Fast Local Internet Protocol, **AMOEBA Servers**-Bullet Server, Directory Server, Replication Server, Run Server, Boot Server, TCP/IP Server.

# TEXT BOOK:

1. Andrew S. Tanenbaum Distributed Operating System, Pearson Education.

# **REFERENCE BOOKS:**

- 1. Mukesh Singhal, Niranjan G. Shivaratri, Advanced Concepts in Operating Systems.
- 2. Sinha, Distributed Operating System: Concepts and Design, PHI.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS421: CLIENT SERVER COMPUTING (CSC)

### (PROFESSIONAL ELECTIVE-II)

Scheme : 2013

Internal Assessment : 30 End Exam : 70 End Exam Duration : 3 Hrs

3 0 0 3

Р

С

T/D

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Course Outcomes: Upon successful completion of this course, the student shall be able to

1.Understand the basics of client-server hardware and software requirements.

2. Understand the development methodologies.

3.Understand data management and access tools.

4.Understand the client-server technologies and requirements.

5.Learn different access tools and data management techniques.

## Unit: 1

**Introduction:** What is client/server computing, Benefits of client/server computing, Evolution of client/server computing, Hardware Trends, Software Trends, components of client/server applications, classes of client/server applications, categories of client/server applications. Understanding of client/server computing: Dispelling the Myths, Obstacles – Upfront.

## Unit: 2

**Client Hardware and Software Requirements:** Client components, client operating systems, what is GUI?, X-Windows versus Windowing, Database access, application logic, client software products: GUI environments, converting 3270/5250 screens, database access tools, GUI design standards, open GUI standards, Interface independence, Testing interfaces, Developments aids.

#### Unit: 3

**Server Hardware and Software Requirements:** Bench marks, categories of servers, features of server machines, classes of server machines, Eight layers of software , Network management environment Network computing environment, extensions, network operating system, loadable modules, server operating systems: OS/2 2.0, windows new technology, Unix based operating systems, Platform independence, transaction processing, Collectivity, intelligent database, stored procedures, triggers, load leveling, optimizer, testing and diagnostic tools, reliability, backup and recovery mechanisms.

#### Unit: 4

Server Data Management and Access Tools: Data manager features, Data management software, database gateways, overview of networking, LAN hardware, network operating systems.

**Development Methodologies:** Convert existing screen interfaces, COBOL to COBOL migration, reengineering existing applications, business reengineering, methodology tools, application development environments, distributed transaction management, integrating multi vendor environments, production requirements.

## Unit: 6

**Related Technologies:** Mobile computing, more Robust servers, integration of network and server operating systems, use of object technologies, ATM switching.

## **TEXT BOOK:**

1. Dawna Travis Dewire, James Martin [2003], Client/Server computing, McGraw-HILL PRODUCTIVITY SERIES

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS422: INTERNET PROTOCOLS (IP)

## (PROFESSIONAL ELECTIVE-III)

Scheme: 2013Internal Assessment : 30End ExamEnd Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Summarize OSI and TCP/IP reference models.
- 2. Classify Sub-netting and Super-netting concepts in IPV4 Addressing.
- 3. Understand forwarding and routing techniques of IP packets in Internet.
- 4. Describe IPV4, ARP, RARP and ICMPV4 Protocols.
- 5. Compare TCP and UDP Protocols.
- 6. Understand HTTP, RTP, RTCP, Voice over IP Protocols and Streaming of Audio, Video.

#### Unit: 1

**Introduction:** Internet administration, OSI model, TCP/IP protocol and addressing. IP addresses, classful addressing, subnetting and supernetting.

## Unit: 2

**Classless addressing:** Variable length block, Subnettting. Delivery, forwarding and routing of IP packet. ARP and RARP.

## Unit: 3

**Internet Protocol:** Datagram, fragmentation, options, checksum, IP package. ICMP: Types of messages, message format, error reporting, query, and checksum.

## Unit: 4

**UDP and TCP:** Process-to-process communication, user datagram, checksum, UDP operation, UDP package. TCP services, features, segment, connection, flow control, error control, congestion control, times, package.

## Unit: 5

**HTTP and Multimedia:** Http architecture, web documents, http. Digitizing audio and video, audio and video compression, streaming stored audio/video, steaming live audio/video, real-time interactive audio/video, RTP, RTCP, voice over IP.

## Unit: 6

**Private Networks:** Private networks, virtual networks, network address translation. IPv6, ICMPv6, transition from IPv4 to IPv6.

## **TEXT BOOKS:**

- 1. Behrouz A. Forouzan [2008], [3<sup>rd</sup> Edition], TCP/IP Protocol Suite, Tata McGraw Hill.
- 2. W.Richard Stevens, G.Gabrani [2001], TCP/IP Illustrated, The Protocols, Pearson Education.

## **REFERENCE BOOKS:**

- 1. Andrew S.Tanenbaum [2007], [4<sup>th</sup> Edition], Computer Networks, Pearson Education.
- 2. S.Keshar [2007], [II Edition], An Engineering Approach to Computer Networks, Pearson Education.
- 3. Douglas E Comer, Internetworking with TCP/IP, Pearson Education.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS423: SENSOR NETWORKS (SN)

#### (PROFESSIONAL ELECTIVE-III)

Scheme	: 2013				
Internal Assess	ment : 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
<b>End Exam Dur</b>	ation : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the role of sensors and the networking of sensed data for different applications.
- 2. Understand the sensor node essentials and the architectural details, the medium access and routing issues and the energy constrained operational scenario.
- 3. Demonstrate the challenges in synchronization and localization of sensor nodes, topology management for effective and sustained communication, data management and security aspects.
- 4. Understand the various network level protocols for MAC, routing, and transportation layers.

## Unit: 1

**Introduction:** Fundamentals of wireless communication technology, the electromagnetic spectrum, radio propagation, characteristics of wireless channels, modulation techniques, multiple access techniques, wireless LANs, PANs, Wireless Internet.

## Unit: 2

**Introduction to adhoc/sensor networks:** unique constraints and challenges, advantages of adhoc/sensor network, driving applications, issues in adhoc wireless networks, issues in design of sensor network, sensor network architecture, data dissemination and gathering.

## Unit: 3

**MAC Protocols:** Issues in designing MAC protocols for adhoc wireless networks, design goals, classification of MAC protocols, MAC protocols for sensor network, location discovery, S-MAC, IEEE 802.15.4.

## Unit: 4

**Routing Protocols:** Issues in designing a routing protocol, classification of routing protocols, tabledriven, on-demand, hybrid, flooding, hierarchical, and power aware routing protocols.

#### Unit: 5

**Transport Layer:** Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocols for Ad Hoc Wireless Networks.
**QoS and Energy Management:** Issues and Challenges in providing QoS, classification of QoS solutions, need for energy management, classification, battery, transmission power, and system power management schemes.

### **TEXT BOOKS:**

- **1.** C. Siva Ram Murthy, and B. S. Manoj, "AdHoc Wireless networks : Architectures and Protocols ", Pearson Education 2008(1,2,3,4,5,6 Units)..
- 2. Feng Zhao and Leonides Guibas, "Wireless Sensor Networks ", Elsevier publication 2004

### **REFERENCE BOOKS:**

- 1. Jochen Schiller, "Mobile Communications ". Pearson Education, 2nd Edition, 2003.
- 2. William Stallings, "Wireless Communications and Networks ", Pearson Education 2004

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS424: ADVANCED DATABASE MANAGEMENT SYSTEM (ADBMS)

# (PROFESSIONAL ELECTIVE-III)

Scheme	: 2013				
Internal Assess	nent · 30	L	T/D	Р	С
End Exam	: 70	3	0	0	3
End Exam Dura	tion : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the complex databases used in multimedia, image databases and document/hypertext databases.
- 2. Determine the database system architecture capability, reliability, effectiveness and efficiency in Parallel and Distributed systems.
- 3. Describe databases, storage of distributed databases and transactions with distributed query processing.
- 4. Understand the automated information retrieval systems with a built-in user interface that facilitates the text mining.
- 5. Interpret Temporal, Spatial and Geographic, Multimedia Databases, Mobility Databases in the states of the real world.
- 6. Determine the design ensuring database integrity by advanced transaction processing systems, transactional workflows and real time, multi databases.

# Unit: 1

Object Based Databases : Complex datatypes, Structured types and Inheritance in SQL.

Table inheritance, Array and Multiset types in SQL, Object identity and reference types in SQL,Implementing O-R features.Persistent programming languages, Object-Oriented v/s Object relational.

# Unit: 2

**Database System Architecture :** Centralized and Client–server architectures, Server system architectures, Parallel systems.

**Parallel Databases :** Introduction, I/O parallelism, Inter query parallelism, Intra query parallelism, Intra operation parallelism, Inter operation parallelism, Design of parallel systems.

## Unit: 3

**Distributed Databases :** Homogeneous and Heterogeneous databases, Distributed data storage, Distributed Transactions, Commit protocols, Concurrency control in distributed databases, Availability, Distributed query processing, Heterogeneous distributed database.

## Unit: 4

**Information–retrieval systems:** Overview, Relevance ranking using terms and Hyperlinks, Synonyms, Homonyms and Ontologies, Indexing of documents, Measuring retrieval, effectiveness Web search engines, Information retrieval and Structured data.

Advanced Data types and New Applications: Motivation, Time in databases, Spatial and Geographic databases, Multimedia databases, Mobility and Personal databases.

### Unit: 6

Advanced Transaction processing: Transaction processing, Monitors, Transactional workflows, Main memory databases, Real time transaction systems, Long duration transactions, Transaction management in Multi databases.

### **TEXT BOOK:**

1. Henry F. Korth & Abraham Silberschatz [2006], Database System Concepts

### **REFERENCE BOOK :**

1. Ramez Elmasri, Navathe [2009], Fundamentals of Database systems

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# CS425: SOFT COMPUTING (SC)

# (PROFESSIONAL ELECTIVE-III)

Scheme : 2013

		L	T/D	Р	С
Internal Assessn	ent : 30	E	170	•	v
End Exam	: 70	3	0	0	3
<b>End Exam Dura</b>	tion : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand working of Artificial Neural Networks.
- 2. Understand the mathematical background for carrying out the optimization associated with neural network learning.
- 3. Demonstrate at least two of the Soft Computing techniques.
- 4. Identify a suitable Soft Computing technology to solve the problem; construct a solution and implement a Soft Computing solution.
- 5. demonstrate some applications of computational intelligence.

### Unit: 1

Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies of ANNs. Supervised Learning Networks: Perceptron Networks, Adaptive Linear Neuron, Back propagation Network.

#### Unit: 2

**Associative Memory Networks:** Training Algorithms for pattern association Auto associative Memory, Bidirectional Associative Memory (BAM), and Hopfield Networks.

**Unsupervised Learning Network:** Introduction, Fixed Weight Competitive Nets, Maxnet, Mexican Hat Net ,Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks.

## Unit: 3

**Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets:** Introduction, Classical Sets (Crisp Sets), Fuzzy Sets, Classical Relations - and Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.

#### Unit: 4

**Membership functions:** Features, Fuzzification, membership value assignments, Defuzzification. **Fuzzy Arithmetic and Fuzzy Measures:** Fuzzy arithmetic, Extension principle, Fuzzy measures.

## Unit: 5

**Fuzzy Rule Base and Approximate Reasoning:** Introduction, Truth Values and tables in Fuzzy logic, Fuzzy Proposition, Formation Rules, Decomposition of Rules, Fuzzy Reasoning and Fuzzy Inference Systems.

**Fuzzy Decision making:** Individual, Multiperson, Multiobjective, Multiattribue and Fuzzy Bayesian Decision Making.

**Genetic Algorithm:** Introduction, Basic Terminologies in Genetic Algorithm, Operators in Genetic Algorithm –Encoding, selection, Crossover and Mutation, Applications.

**Application of Soft computing:** Optimization of Traveling Salesman Problem using Genetic Algorithm Approach, Genetic Algorithm –Based Internet search Technique

# **TEXT BOOKS:**

1. S.N.Sivanandam, S.N.Deepa "Priciples of Soft Computing" WILEY Second Edition 2013

2. S.R. Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing" PHI/Pearson Education, New Delhi 2004.

3. S. Rajasekaran & G.A. Vijayalakshmi Pai, PHI, New Delhi 2003

# **REFERENCE BOOKS:**

- 1. T. J. Ross, "Fuzzy Logic with Engineering Applications." TMH, New York, 1997.
- 2. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
- 3. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions

# **CS426: BIOINFORMATICS (BI)**

# (PROFESSIONAL ELECTIVE-III)

Scheme: 2013Internal Assessment: 30End Exam: 70End Exam Duration: 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the scope and importance of Bioinformatics.
- 2. Gain knowledge in understanding types of databases and their use.
- 3. Understand the knowledge Genome Mapping.
- 4. Demonstrate the basics of RNA sequence and DNA.
- 5. Learn basic terminology of Bioinformatics.
- 6. Gain knowledge about types of databases in Bioinformatics.
- 7. Apply the knowledge of Genome Mapping, RNA, DNA in real time situations.

## Unit: 1

**Introduction to Bioinformatics:** Aims and tasks of Bioinformatics, Applications of Bioinformatics, Challenges and opportunities, Computers and programs ,Internet, World Wide Web ,Browsers.

## Unit: 2

**Databases:** Importance of databases, nucleic acid sequence databases, protein sequence data bases, structure databases, bibliographic databases and virtual library, specialized analysis packages.

## Unit: 3

**Biological databases and data mining:** Biological Information on the web, Introduction to databases; Classification of Biological databases; Information retrieval from Databases; Data Mining and Visualization (RASMOL).

## Unit: 4

**Genome mapping:** Genome sequencing; Genome Mapping; Comparative Sequence Analysis; Gene Prediction Methods &Tools, Gene Annotation; Human Genome Mapping (HGP).

## Unit: 5

**RNA sequence and structure analysis:** si-RNA design and development, micro RNA identification strategies, RNA secondary structure, RNA structure Prediction Methods.

## Unit: 6

**Special topics in Bioinformatics:** DNA Sequence data base specialised genomic Resources, DNA Sequence analysis: Why analyze DNA? Gene structure Features of DNA sequence analysis

## **TEXT BOOKS:**

1.S.C. Rastogi & others, *Bioinformatics- Concepts, Skills, and Applications*, CBS Publishing, 2003.2.Bioinformatics. Genome and sequence analysis by David Mount, CSH Publications3.T.K.Attwood, D.J. Parry-Smith, Introduction to Bioinformatics , Pearson Education Asia,2003.

## **REFERENCE BOOKS:**

1.C S V Murthy, *Bioinformatics*, Himalaya Publishing House, 1st Edition 2003.

2. Essential Bioinformatics by Jin Xiong, Cambridge University Press, 2011.

3.Dan E. Krane, Michale L. Raymer, fundamental Concepts of Bioinformatics , Pearson Education Asia, 2003.

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# List of Interdisciplinary Electives

1	IDE301	Optimization Techniques
2	IDE302	Remote Sensing and GIS
3	IDE303	New and Renewable Energy Systems
4	IDE304	Artificial Intelligence and Expert Systems
5	IDE305	Nano Technology
6	IDE306	Introduction to Information Systems
7	IDE307	Mechatronics
8	IDE308	Control and Automation
9	IDE309	Web Development Programming
10	IDE310	Environmental and Water Resources Engineering
11	IDE 312	Object Oriented Programming Through Java
12	IDE313	Internet of Things
12	IDE 314	Python Programming

# **IDE 301: OPTIMIZATION TECHNIQUES (OT)**

# (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal assessment	: 30	L	T/D	Р	С
End Exam Marks	: 70				
<b>End Exam Duration</b>	: 3 Hrs	3	-	-	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the types of decision making environment by using mathematical models.
- 2. Construct mathematical models of real world physical systems for quantitative analysis of managerial problems in industry;
- 3. Understand the systematic approach to allocate scarce resources more effectively.
- 4. Develop mathematical models from the verbal description of the real system.
- 5. Suggest proper deployment of scarce resources and provide optimum solution.

### Unit: 1

**Introduction:** Definition, Nature and Significance of Operations Research, Models in Operations Research, Application Areas of Operations Research in Management.

Linear Programming: Model Formulation, Graphical solution of L.P.P, Slack, Surplus and Artificial variables, Simplex method, Big M method, Degeneracy in L.P.P, Dual linear programming problem, Solution of the Primal problem from the solution of the Dual Problem.

## Unit: 2

**Transportation Problems:** Balanced and unbalanced Transportation problems, Initial basic feasible solution using N-W corner rule, least cost entry method and Vogel's approximation method, Optimal Solution, Degeneracy in Transportation Problem.

**Assignment Problems:** The Assignment Algorithm (Hungarian Assignment method), Balanced and Unbalanced Assignment Problems, Travelling Salesman Problem as an Assignment Problem.

## Unit: 3

**Game Theory :** Definitions and Terminology, Two Person Zero Sum Games, Pure Strategy Games (with Saddle Point), Principal of Dominance, Solution for Mixed Strategy Games (Game without Saddle Point),

**Queuing Theory:** Introduction, single channel - poission arrivals - exponential service times with infinite population, Multi channel - poisson arrivals - Exponential service times with infinite population.

#### Unit: 4

Project Management: Phases of project management, guidelines for network construction, critical path, forward and backward pass, floats and their significance, crashing for optimum duration. Sequencing Models :Introduction, General assumptions, processing n jobs through 2 machines, processing 'n' jobs through m machines, Processing 2 jobs through m machines.

Dynamic Programming: General Concept of Dynamic Programming, Problems related to general allocation and capital investment decisions.

# Unit: 6

Inventory Control: Definition, Costs associated with inventory, Basic EOQ model, Inventory control systems – P System, Q System, ABC analysis, VED analysis

Simulation: Introduction, Advantages of Simulation, Generation of Random numbers, Simulation Languages, Monte Carlo Simulation, Application of Simulation to queuing theory, inventory control

# **TEXT BOOKS:**

Hamdy, A. Taha, Operations Research-An Introduction, Prentice Hall of India Pvt. Ltd.,
S.D. Sharma, Operations Research, Kedarnath, Ramnath& Co., Meerut,
R. Paneer Selvam, Operations Research, PHI Learning Pvt. Ltd., New Delhi.

# **REFERENCE BOOKS:**

- 1. Hillier / Libernam, Introduction to Operations Research , Tata McGraw Hill Edition
- 2. J.K. Sharma, Operations Research-Problems and Solutions, Macmillan India Ltd.
- 3. Billy E Gillett, Introduction to Operations Research A Computer Oriented Algorithmic Approach, Tata McGraw Hill Edition.

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### IDE 302: REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM (RS&GIS)

## (Interdisciplinary Elective for B. Tech – VI Semester)

Scheme : 2013				
Internal Assessment : 30	L	T/D	Р	С
End Exam Marks : 70	3	0	0	3
End Exam Duration : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the basics, importance, analysis and applications of RS and GIS. Understand the various types of operating systems of RS and GIS.
- 2. Explain the principles and applications of Remote Sensing and various types of platforms used in Remote Sensing.
- 3. Explain the applications of GIS.
- 4. Explain GIS data types, Input techniques.

#### Unit: 1

### **Introduction To Remote Sensing:**

**Concept and Scope of Remote Sensing:** Definitions, Process and Characteristics of Remote Sensing System, Advantages and limitations.

**Concept of Electromagnetic Radiation (EMR):**Wavelength-frequency-energy relationship of EMR, EMR Spectrum and its properties, EMR wavelength regions and their applications, Interaction of EMR with matter, Spectral signatures.

Energy Interaction in the atmosphere and with Earth Surface Features: Scattering, absorption,

transmission, atmospheric windows Spectral Reflectance Curve, Concept of signatures.

#### Unit: 2

#### **Platforms and Sensors:**

Introduction: Sensor materials, Sensor System - Framing and Scanning System,

Whiskbroom scanners, Push-broom scanners, Side Looking scanner.

**Types and Characteristics of Sensor:** Imaging and non-imaging sensors, Active and passive sensors, Resolution of Sensors - Spectral, Spatial, Radiometric & Temporal, Scale, Mapping unit, Multi-band concepts and False Colour Composites.

**Remote Sensor Platforms and Satellite Orbits:** Ground, Airborne and Space borne Platforms, Orbital Characteristics – Coverage, Passes, Pointing Accuracy, Geostationary, Sun synchronous, shuttle orbit. **Space Imaging Satellites:** Early history of space imaging; Multispectral and Hyperspectral sensors, Radar, Lidar; Specification of some popular satellites – IRS, Landsat and SPOT series; High resolution satellites – IKONOS, Cartosat, Quickbird, OrbView, GeoEye, Pléiades, WorldView; Other latest earth resource satellites.

#### Unit: 3

#### **Remote Sensing Applications:**

Scope of Remote Sensing Applications - Potentials and Limitations.

Applications in land use and land cover analysis.

Resource evaluation - Soils, minerals forest and agriculture.

Water Resource Applications- Mapping, monitoring of surface water bodies, tanks, lakes/ reservoirs. Environmental applications.

# **Geographic Information System:**

**Basic Concepts**: Definition of GIS, Components of GIS, Variables - points, lines, polygon, Functionality of GIS, Areas of GIS application, Advantage and Limitation of GIS.

# Unit: 5

**GIS Data:** Spatial and Attribute Data, Information Organization and Data Structures - Raster and Vector data structures, Data file and database

**Creating GIS Database**: GIS Software's, file organization and formats, Geo-database, Rectification, Digitization and Map Composition.

## Unit: 6

**GIS Data Input & Editing:** Nature and Source of data, Method of spatial and Attribute data capture -Primary and Secondary, digitization and scanning method, Techniques and procedure for digitizing, Errors of Digitization and rectification, Re-projection, Transformation and Generalization, Edge matching and Rubber sheeting, Topology.

# **TEXT BOOKS:**

- 1. M. Anji Reddy; Text Book of Remote Sensing and Geographic Information System, BS Publication.
- 2. Lo C.P. & Yeung A.K.W., (2004). Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi.

## **REFERENCE BOOKS:**

- 1. B.Bhatta; Remote sensing and Geographic Information System, Oxford Publications.
- 2. Siddiqui, M.A.; 2006, Introduction to Geographical Information System, Sharda Pustak Bhavan, Allahabad.
- 3. Curran, Paul J; 1985, Principles of Remote Sensing, Longman, London.
- 4. NRSA, IRS, Data User Handbook, Hyderabad

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## IDE 303: NEW AND RENEWABLE ENERGY SYSTEMS(NRES)

## (Interdisciplinary Elective for B. Tech. - VI Semester)

Scheme: 2013Internal Assessment: 30End Exam Marks: 70End Exam Duration: 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the concept and importance of renewable energy sources.
- 2. Demonstrate the various renewable energy sources like wind, solar, biomass, Ocean energy, Fuel cells and MHD systems
- 3. Understand the biomass gasification and combustion, Theory of flat plate collectors, photo voltaic, thermal applications and limitations of solar energy are also provided.

#### Unit: 1

**Introduction and Energy Conservation:** Classification of energy sources-Importance of renewable energy sources and energy chain-Principles of energy conservation –Energy conservation opportunities

**Fundamentals of Solar Energy:** Extra terrestrial and terrestrial radiation- Solar constant and solar radiation geometry-Solar time and day length-Estimation of monthly average daily total radiation on horizontal surface and tilted surface-Measurements of radiation data.

#### Unit: 2

**Solar Collecting Devices :** Flat plate collector- Losses associated with collector-Method of determination of top loss, side loss and bottom loss coefficient -Performance parameters affecting the collector performance-Efficiency of flat plate collector-selective surfaces- Air collectors-Classification of concentrating collector-Tracking of CPC collector

**Solar Thermal Systems:** Methods of storing solar energy-Solar water heating-Solar refrigeration system – Solar thermal power generation-Solar distillation-Solar space heating.

#### Unit: 3

**Solar Voltaic Systems & Emerging Technology:** Basic principle of PV cell-Arrangements of PV cell-classification of PV cell-Principle of magneto hydro dynamics-thermo electric and thermionic conversion, Introduction to Fuel cell.

#### Unit: 4

**Wind Energy:** Origin of wind-Application of wind power –Betz limit-Components of Horizontal axis wind turbine-Types of blades- Classification of vertical axis turbine.

#### Unit: 5

**Biomass Energy:** Photosynthesis process- Biomass conversion technologies- Biogas production - Types of digester- Factors affecting the digester performance

**Geothermal Energy:** Types of geothermal energy resources-Energy conversion through geothermal energy resources-Environmental consideration.

Ocean Thermal Energy Conversion: Principle of OTEC- Anderson and Claude cycles Tidal energy: Introduction- tidal energy conversion methods, Wave energy: Introduction, conversion methods

## **TEXT BOOK**:

1. B. H. Khan, Non-conventional Energy Sources, TMH Publishers, New Delhi.2003.

# **REFERENCE BOOKS**:

- 1. G.D Rai, Non-conventional Energy Sources, Khanna Publishers, New Delhi.1989
- 2. S. Rao and Paulekar, Energy Technology, Khanna Publishers, New Delhi.2000
- 3. W. R. Murphy & G. Mckay, Energy Management, Butterworth & Co. Publishers, New Delhi.2001
- 4. B.Sreenivasa Reddy & K.HemachandraReddy, Thermal data hand book, IK International Publishers, Bangaloore 2007

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## IDE 304: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS(AIES)

## (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal Asses	sment : 30	L	T/D	Р	С
End Exam Ma	arks : 70	3	0	0	3
<b>End Exam Du</b>	ration : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand how foundations laid for Artificial Intelligence.
- 2. Understand the nature, Structure and Behavior of agents in the Environment.
- 3. Solving agent's problems by using Breadth, Depth, Uniform, Depth-limited, Iterative Deepening, Bidirectional Search Strategies.
- 4. Apply Greedy, A \*, Memory bounded heuristic search strategies, heuristic functions for Solving agent's problems.
- 5. Apply Hill-climbing, simulated annealing, Local Beam Search, Genetic Algorithms (Local search problems) for Agent's Problems.
- 6. Understand features and working of expert system.

## Unit: 1

**Introduction:** What Is AI?, The Foundations of Artificial Intelligence, The History of Artificial Intelligence.

### Unit: 2

**Intelligent Agents:** Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.

#### Unit: 3

**Solving Problems by Searching:** Problem-Solving Agents, Example Problems, Searching for Solutions, Uninformed Search Strategies.

#### Unit: 4

Informed (Heuristic) Search Strategies- Greedy best-first search, A\* search, Memory-bounded heuristic search, Learning to search better. Heuristic Functions.

## Unit: 5

**Beyond Classical Search:** Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces, Searching with Partial Observations.

#### Unit: 6

**Introduction to Expert System**: What are Expert Systems, Features of Expert system, Features of good expert system, Role of human in Expert system, Expert system organization, Difference between expert system and conventional program, Basic activities of expert system and the areas in which they solve problems, Prospector system features, working.

## **TEXT BOOKS:**

- 1. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third Edition, 2010. Pearson Education.
- 2. Donald A.Water man," A Guide to expert systems", Addison Wesley publishing company.

### **REFERENCE BOOKS:**

- 1. Judea Pearl, "Probabilistic Reasoning in Intelligent Systems", Morgan Kaufmann, 1988.
- 2. Tom Mitchell, "Machine Learning", McGraw Hill, 1997.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## IDE 305:NANOTECHNOLOGY (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme: 2013Internal Assessment : 30End Exam Marks: 70End Exam Duration : 3 Hrs

L	T/D	Р	С
3	0	0	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Acquire some of the fundamental principles behind nanotechnology and nonmaterial's and their vital role in novel sensing properties and applications.
- 2. Understand the fabrication, characterization, and manipulation of nonmaterial's, nanosensors, and how they can be exploited for new applications.
- 3. Understand novel sensing tools that make use of nanotechnology to screen, detect and monitor various events in personal or professional life

# Unit: 1

**Introduction to Nanotechnology:** Definition of nanotechnology; main features of nanomaterials; types of nanostructures (0D, 1D, and 2D structures); nanocomposites; and main chemical/physical/electrical/optical properties of nanomaterials.**Methods for characterizing the nanomaterials:** Atomic Force Microscopy (AFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and spectroscopy- and spectrometry-based surface analysis techniques. Fabrication of sensors by bottom-up and top-down approaches; self-assembly of nanostructures; and examples for nanotechnology application.

## Unit: 2

**Introduction to Sensors' Science and Technology:** Definition of sensors; main elements of sensors; similarities between living organisms and artificial sensors; working mechanism of physical sensation (seeing, hearing, and feeling) and chemical sensation (smelling and tasting); the parameters used for characterizing the performance of sensors: accuracy, precision, sensitivity, detection limit, dynamic range, selectivity, linearity, resolution, response time, hysteresis, and life cycle.

## Unit: 3

**Metal nanoparticle-based Sensors:** Definition of nanoparticle; features of nanoparticles; and production of nanoparticles by physical approach (laser ablation) and chemical approaches (Brust method, seed-mediated growth, etc.).Quantum Dot Sensors. Definition of quantum dot; fabrication techniques of quantum dots; Macroscopic and microscopic photoluminescence measurements; applications of quantum dots as multimodal contrast agents in bioimaging; and application of quantum dots as biosensors.

## Unit: 4

**Nanowire-based Sensors**: Definition of nanowires; features of nanowires; fabrication of individual nanowire by top-down approaches and bottom-up approaches; and fabrication of nanowire arrays (fluidic channel, blown bubble film, contact printing, spray coating, etc.).Carbon Nanotubes-based Sensors: Definition of carbon nanotube; features of carbon nanotubes; synthesis of carbon nanotubes; fabrication and working principles of sensors based on individual carbon nanotube; fabrication and working principles of sensors based on random array of carbon nanotubes.

Sensors Based on Nanostructures of Metal Oxide: Synthesis of metal oxide structures by dry and wet methods; types of metal oxide gas sensors (0D, 1D, and 2D); defect chemistry of the metal oxide sensors; sensing mechanism of metal-oxide gas sensors; and porous metal-oxide structures for improved sensing applications.

## Unit: 6

Mass-Sensitive Nanosensors: Working principle of sensors based on polymeric nanostructures; sensing mechanism and applications of nanomaterial-based of chemiresistors and field effect transistors of (semi-)conductive polymers, w/o inorganic materials.

Arrays of Nanomaterial-based Sensors: A representative example for the imitation of human senses by means of nanotechnology and nanosensors: electronic skin based on nanotechnology.

### **TEXT BOOKS:**

- 1. Jiří Janata, Principles of Chemical Sensors, Springer, 2d Edition (1989).
- 2. Roger George Jackson, Novel Sensors and Sensing, CRC Press (2004).

## **REFERENCE BOOKS:**

- 1. Florinel-Gabriel Banica, Chemical Sensors and Biosensors: Fundamentals and Applications, John Wiley and Sons (2012).
- 2. Ramsden Jeremy, Nanotechnology, an Introduction. Elsevier (2011).

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## **IDE306:INTRODUCTION TO INFORMATION SYSTEMS (IIS)**

## (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal Assessment	30	L	T/D	Р	С
End Exam Marks	: 70	2	2		3
<b>End Exam Duration</b>	3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the functionalities of operating system, linkers, loaders, assemblers and compilers.
- 2. Describe the steps involved in the life cycle of a software project.
- 3. Illustrate linear search, binary search, bubble sort, selection sort and insertion sort using the concepts of C language.
- 4. Summarize the steps of E-R Modeling for library system, university database and banking scenarios.
- 5. Discuss the need for 1NF, 2NF, 3NF and BCNF.
- 6. Explain the working of DDL, DML and DCL statements using Oracle 10g.

### Unit: 1

**Fundamentals of Computers & Computer Architecture:** Introduction, Organization of a small computer, Central Processing Unit, Execution cycle, Instruction categories, measure of CPU performance Memory, Input/output devices, BUS, addressing modes

System Software: Assemblers, Loaders and linkers, Compilers and interpreters.

#### Unit: 2

**Operating System:** Introduction, Process Management, CPU scheduling, Memory Management Schemes, Page replacement algorithms.

**Software Engineering:** Introduction to software engineering, Life cycle of a Software Project, Software Development Models.

## Unit: 3

**Coding Standards and Best Practices:** Introduction to C Programming, Basics of C Language, Data Types in C, Functions, arrays, pointers, structures.

**Sorting and Searching Techniques:** Searching Algorithms – Linear Search, Binary Search, Sorting Algorithms – Bubble Sort, Selecting Sort and Insertion Sort.

## Unit: 4

**Relational Database Management System:** Introduction to DBMS, the database technology, data models. Database Users.

**Entity Relationship (E-R) Modeling:** Introduction, Notations, Modeling E-R Diagrams, Case Study1,2& 3, Merits and Demerits of E-R modeling.

## Unit: 5

**Normalization:** Introduction, Need for Normalization, Process Normalization, Types of Normal Forms (1 NF, 2 NF, 3 NF & BCNF), Merits and Demerits of Normalization.

**Structured Query languages (SQL):** History of SQL, Data Types, Data Definition Language Statements (DDL), Data Manipulation Language (DML), Data Control Language (DCL), writing simple queries.

# **TEXT BOOKS:**

- 1. Campus Connect Foundation Program Computer Hardware and System Software Concepts, Programming Fundamentals- Vol. 1, INFOSYS.
- 2. Campus Connect Foundation Program Relational Database management System, Client Server Concepts, Introduction to Web Technologies - Vol. – 2, INFOSYS
- 3. Campus Connect Foundation Program Object Oriented Concepts System Development Methodology, User Interface Design Vol. 3, INFOSYS
- 4. Yashwant Kanetkar, Let us "C" bpb Publications 8th ed., 2007.

# **REFERENCE BOOKS:**

- 1. Andrew S. Tanenbaum, Structured Computer Organization, PHI, 3rd ed., 1991
- 2. Silberschatz and Galvin, Operating System Concepts, 4th ed., Addision-Wesley, 1995
- 3. Wilbert O. Galitz, Essential Guide to User Interface Design, John Wiley, 1997
- 4. Alex Berson, Client server Architecture, Mc Grew Hill International, 1994
- 5. Henry F Korth, Abraham Silberschatz, *Database System Concept*, 2nd Edition, McGraw-HillInternational editions, 1991
- 6. Roser S. Pressman, *Software Engineering-A Practitioners approach*, McGraw Hill, 5th ed., 2001

# NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# IDE 307: MECHATRONICS (MT)

## (Interdisciplinary Elective for B. Tech. - VI Semester)

		L	T/D	Р	С
Scheme	: 2013	_		_	-
Internal assessment	: 30				
End Exam Marks	: 70	3	-	-	3
<b>End Exam Duration</b>	: 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Learn & achieve in-depth knowledge in the fundamentals, design, analysis and operation of mechatronics systems.
- 2. Understand the integration of mechanical devices, actuators, sensors, electronics, intelligent controllers and computers.

#### Unit: 1

**Introduction:** Definition of Mechatronics, Mechatronics in manufacturing, Products, and design. Comparison between Traditional and Mechatronics approach.

#### Unit: 2

Review of fundamentals of electronics. Data conversion devices, sensors, microsensors, transducers, signal processing devices, relays, contactors and timers. Microprocessors controllers and PLCs.

#### Unit: 3

**Drives:** stepper motors, servo drives. Ball screws, linear motion bearings, cams, systems controlled by camshafts, electronic cams, indexing mechanisms, tool magazines, transfer systems.

#### Unit: 4

**Hydraulic systems:** flow, pressure and direction control valves, actuators, and supporting elements, hydraulic power packs, pumps. Design of hydraulic circuits.

#### Unit: 5

**Pneumatics:** production, distribution and conditioning of compressed air, system components and graphic representations, design of systems. Description.

#### Unit: 6

Description of PID controllers. CNC machines and part programming. Industrial Robotics.

#### **TEXT BOOKS:**

- 1. HMT ltd. Mechatronics, Tata Mcgraw-Hill, New Delhi, 1988.
- 2. G.W. Kurtz, J.K. Schueller, P.W. Claar . II, Machine design for mobile and industrial applications, SAE, 1994.
- 3. T.O. Boucher, Computer automation in manufacturing an Introduction, Chappman and Hall, 1996.

### **REFERENCE BOOKS:**

- 1. R. Iserman, Mechatronic Systems: Fundamentals, Springer, 1st Edition, 2005
- 2. Musa Jouaneh, Fundamentals of Mechatronics, 1st Edition, Cengage Learning, 2012.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## **IDE308: CONTROL & AUTOMATION (CA)**

# (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013	Ŧ	TT (T)	ъ	a
Internal assessment	: 30	L	I/D	P	C
End Exam Marks	: 70				
<b>End Exam Duration</b>	: 3 Hrs	3	-	-	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

1. Represent the mathematical model of a system.

- 2. Determine the response of different order systems for various step inputs
- 3. Understand the stability of the system.

4.Demonstrate Programmable Logic Controllers using ladder logic, other programming standards

5.Describe the advantages, use and applications of Programmable Logic Controllers (PLC's).

## Unit: 1

**Modeling of Linear Control Systems:** open-loop and closed-loop systems, control system components, Advantages, disadvantages & Applications of automated control system. Servo motors, position control systems, Transfer functions, equations of electrical and mechanical systems.

### Unit: 2

**Block Diagrams:** block diagram representation and manipulation, signal flow graphs-mason's gain formula to determine overall system gain.

**Feedback Characteristics of Control Systems:** Feedback and non-feedback systems, effects of feedback.

## Unit: 3

**Time Response:** Types of input, transient response of second order system for step input, timeresponse specifications, steady state error and error constants, proportional, derivative and integral controls.

Concept of Stability: Stability of systems-Routh Hurwitz criterion.

**Compensation (Without Design):** The necessity of compensation, series and parallel compensation. Realization of basic lead, Lag and lead-Lag compensators.

## Unit: 4

**Root Locus:** Definition of Root Locus, construction Procedure, properties of typical systems analyzed by root locus techniques. Bode Plot

## Unit: 5

**PLC Basics:** PLC system, I/O modules and interfacing, CPU processor, programming Equipment, programming formats, construction of PLC ladder diagrams, Devices connected to I/O modules. **PLC Programming:** Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation.

**Digital logic gates**: Programming with logic gates, programming in the Boolean algebra system, conversion examples.

**PLC Functions:** Timer functions & Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions.

# **TEXT BOOKS:**

- 1. Nagrath and Gopal, "Control systems Engineering", New Age International Publications.2003
- 2. B. C. Kuo, "Automatic Control Systems", Oxford.2003
- 3. K. Ogata, "Modern control Engineering", Pearson 2003
- 4. Naresh K.Sinha, "Control Systems", New Age International Publishers. 1998
- 5. B. S. Manke, "Linear Control Systems".1996
- 6. John W. Webb & Ronald A. Reiss, "Programmable Logic Controllers- Principles and Applications" Fifth Edition, PHI

## **REFERENCE BOOKS:**

- 1. Madan Gopal, "Control Systems", TMH. 2003
- 2. Dorf, Bishop, "Modern Conrtol systems", Addison Wesley1998
- 3. (Shaum'sout line series), "Feedback control systems", TMH1986
- 4. R.C.Shukla, "Control Systems", Dhanpat Rai.
- 5. Ashok Kumar, "Control Systems", TMH.
- 6. JR. Hackworth & F.D. Hackworth Jr., "Programmable Logic Controllers- Programming Method and Applications", Pearson. 2004

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### IDE 309:WEB DEVELOPMENT PROGRAMMING (WDP)

## (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal Assessme	ent : 30	L	T/D	Р	С
End Exam Marks	: 70	2	2	-	3
<b>End Exam Durat</b>	on : 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Excel in the basic concepts of Website design.
- 2. Understand various considerations in building a website.
- 3. Visualize the concepts of HTML.
- 4. Understand the basic concepts of CSS.
- 5. Demonstrate the concept of web designing.

### Unit: 1

**Introduction To The Web:** Understanding The Internet And World Wide Web, History Of The Web, Protocols Governing The Web, Creating Websites For Individuals And The Corporate World, Web Applications, Writing Web Projects, Identification Of Objects, Target Users, Web Team.

### Unit: 2

**Planning and process development:**Planning And Process Development, Web Architecture, Major Issues In Web Solution Development, Web Servers, Web Browsers, Internet Standards, TCP/IP Protocol Suite, IP Addresses, Cyber Laws.

#### Unit: 3

**Hypertext Transfer Protocol:** Introduction, Web Servers And Clients, Resources, URL And Its Anatomy, Message Format, Persistent And Non Persistent Connections, Web Caching, Proxy.

## Unit: 4

**Hypertext Markup Language (HTML):** History Of HTML And W3C, Html and Its Flavors, Html Basics, Elements Attributes And Tags, Basic Tags, Advanced Tags, Frames, Images, Meta Tag, Planning Of Web Page, Model And Structure For A Website, Designing Web Pages, Multimedia Content Frames.

## Unit: 5

**Cascading Style Sheet(CSS):** Introduction, Advantages, Adding CSS, Browser Compatibility, CSS and Page Layout, Selectors.

#### Unit: 6

**Hosting And Promoting Websites:** Structure of Websites, Web Development Tools, Web Files Using Microsoft Word, Microsoft Front Page, Adobe Dreamweaver, GIF Animator, Hosting Websites, Getting A Domain Name, Redirectors On The Web, Server Software, Submitting For Search Engines, Visitor Analysis And Statistics, Website Promoting Methods.

# **TEXT BOOKS:**

1.UtamK.Roy, "Web Technologies", Oxford Higher Education. 2.K.L.James, "The Internet- A User Guide", 2<sup>nd</sup> Edition, PHI Publications.

# **REFERENCE BOOKS:**

1.Kognet Learning Solutions inc., "HTML5 in Simple Steps". Dreamtech press. 2.Steven M.Schafer, "HTML,XHTML and CSS Bible 5<sup>th</sup> Edition", Wiley India.

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

# IDE 310:ENVIRONMENTAL AND WATER RESOURCES ENGINEERING (Inter disciplinary Elective for B. Tech. – VI Semester)

Scheme: 2013Internal Assessment :30End Exam Marks: 70End Exam Duration :3 Hrs

L	T/D	Р	С
3	-	-	3

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Identify the source of waste water and solid waste, identifying the physical, chemical and biological properties of waste water, India's water budget, Irrigation methods, fundamentals of Hydro power development.
- 2. Understand the Hydrological cycle, flood management, Financial analysis of water resources project, Geological formations of ground water, Hydro power development.

### Unit:1

**Water Supply System :**Need for protected water supply system – Objectives of Water supply system –Routine water analysis for physical, chemical and bacteriological characteristics and their significance – Standards for drinking water – Water borne diseases and their control.

### Unit: 2

**Sanitation:** Aim and objectives of sanitation – Conservancy and water carriage systems – Classification of sewerage systems – Separate, combined and partially combined systems – disposal of domestic waste water.

#### Unit: 3

**Urban Solid Waste Management:** Types, sources, quantity and composition of urban solid waste – Collection, transportation, recovery & reuse – Disposal methods such as composting, incineration, sanitary land fill.

#### Unit: 4

**Hydrology:** Hydrologic cycle – Global water budget – India's water budget – Practical applications of Hydrology – Climate and weather seasons of India – Floods – Flood management.

#### Unit: 5

Water Resources Development: Planning for WRD – Purposes of WRD project multipurpose project – Functional requirements – Financial analysis of a project – Irrigation methods – Ground water – Geological formations – other sources of ground water – Water wells.

#### Unit: 6

**Water Power Engineering:** Sources of energy – Classification – Types of power planning for water power development – History – Advantages – Comparison – Layout of hydro power plant – Economics of Hydro power development.

# **TEXT BOOKS:**

- 1. Santosh Kumar Garg [1992], Environmental Engineering Vol.1, Khanna Publications.
- 2. P. Jaya Rami Reddy, *A Text book of Hydrology (3rd Edition*, 2011), Laxmi Publications, New Delhi.
- 3. Dr. P.N. Modi [2014], Irrigation and water Resources Engineering, Standard Book House

# **REFERENCE BOOKS:**

- 1. S.K.Hussain [1994], Water supply and sanitary Engineering, Oxford & IBH.
- 2. H.M. Raghunath [2009], Groundwater, Wiley Eastern Ltd
- 3. K.Subramanya, *Engineering Hydrology*, Tata Mc Graw Hill Publishing Co. Ltd, New Delhi.
- 4. M.M. Dandekar and K.N. Sharma [2010], *A Text Book of Water Power Engineering*, Vikas Publications.
- 5.R.K.Sharma and T. K. Sharma [2003], *A Text book of Water Power Engineering including Dams, Engg. Hydro & Fluid Power Engg.*, S. Chand Company Ltd., New Delhi–110 055

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## IDE 312: OOP's through JAVA (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme :	2013				
Internal Assessment :	30	L	T/D	Р	С
End Exam :	70				
End Exam Duration :	3 Hours	2	2		3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. understand the fundamental features of an object oriented language through Java.
- 2. write computer programs in Java to solve specified problems through Inheritance.
- 3. Demonstrate the use of packages and interfaces.
- 4. understand the concept of exception handling.

# Unit: 1

**Fundamentals of Object –Oriented Programming:** Introduction, Object-Oriented Paradigm, Basic Concepts of Object -Oriented Programming, Benefits of OOP, Applications of OOP. **Introduction:** Over view of java, the Java Buzzwords, Data types, Variables and arrays, Operators.

# Unit: 2

**Decision Making and Branching:** simple if statement, if-else statement, nested if-else, else if ladder, switch statement. **Decision Making and Looping:** While, do-while, for statements, Classes, objects and methods. **I/O**: I/O Basics, Reading Console input, writing Console output.

# Unit: 3

**Inheritance**: Basic concepts, uses super, method overriding, dynamic method dispatch, Abstract class, using final.

## Unit: 4

**String Handling:** String Constructors, Special String Operations-String Literals, String Concatenation, Character Extraction, String Comparisons. Searching Strings, Modifying a string.

# Unit: 5

Packages and Interfaces: Packages, Access protection, Importing packages, Interfaces.

# Unit: 6

**Exception Handling**: Fundamentals, Types of Exception, Usage of try, catch, throw, throws and finally keywords.

#### **TEXT BOOKS:**

E.Balagurusamy, Programming with Java: A primer, III Edition, Tata McGraw-Hill, 2007.
HerbertSchildt [2008], [5th Edition], The Complete Reference Java2, TATA McGraw-Hill.

### **REFERENCE BOOKS:**

Bruce Eckel [2008], [2nd Edition], Thinking in Java, Pearson Education.
H.M Dietel and P.J Dietel [2008], [6th Edition], Java How to Program, Pearson Ed.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one *compulsory* question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

### **IDE313: INTERNET OF THINGS (IoT)**

### (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal Assessment	: 30	L	T/D	Р	С
End Exam Marks	: 70	3	0	0	3
End Exam Duration	: 3 Hrs				

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Design a portable IoT using Arduino/ equivalent boards and relevant protocols.
- 2. Develop web services to access/control IoT devices.
- 3. Understand IoT applications and connect to the cloud.
- 4. Demonstrate applications of IoT in real time scenario

#### Unit-1

**Introduction to IoT:** Definition & Characteristics of IoT-Physical design - Logical design – IoT Enabling Technologies-IoT Levels and Deployment Templates -IoT vs M2M.

#### Unit-2

**IoT Design Methodology:** IoT systems management – Simple Network Management Protocol (SNMP)- Network Operator Requirement- IoT Design Methodology – Specifications Integration and Application Development

## Unit-3

Building IoT with Arduino: AVR Family with Arduino AT Mega 328- Interfaces - Arduino IDE

- Programming - Interfacing LED- Interfacing LED and Switch with Arduino

#### Unit-4

Wireless Technologies for IoT (Layer 1 & 2): WiFi (IEEE 802.11), Bluetooth/Bluetooth Smart, ZigBee/ZigBeeSmart, UWB (IEEE 802.15.4)

## Unit-5

**Building IoT with Raspberry Pi:** Basic Building blocks of IoT Device- Raspberry Pi – About the board – Raspberry Pi Interfaces – Programming Raspberry Pi with Python– Controlling LED, Interfacing LED and Switch with Raspberry Pi.

#### Unit-6

**Case Studies and Advanced Topics:** Various Real time applications of IoT- Connecting IoT to cloud – Cloud Storage for IoT – Data Analytics for IoT – Software & Management Tools for IoT

## **Text books/References:**

- 1. ArshdeepBahga, Vijay Madisetti, "Internet of Things A hands-on approach", Universities Press, 2015.
- 2. Manoel Carlos Ramon, "Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers", Apress, 2014.
- 3. Marco Schwartz, "Internet of Things with the Arduino Yun", Packt Publishing, 2014.

### NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

## **IDE314:PYTHON PROGRAMMING (PYP)**

# (Interdisciplinary Elective for B. Tech. – VI Semester)

Scheme	: 2013				
Internal assessment	: 30	L	T/D	Р	С
End Exam Marks	: 70				
<b>End Exam Duration</b>	: 3 Hrs	3	-	-	3

**Course Outcomes:** Upon successful completion of this course, the student shall be able to

- 1. Understand fundamentals of programming -variables, conditions, Lists, Tuples, Dictionaries.
- 2. Understand Arithmetic, Relational, Assignment, Logical, Bitwise, Membership, Identity Operators and Conditional Statements.
- 3. Understand Functions, Scope of variables, Modules, Packages.
- 4. Understand Concepts of Exception Handling, Classes and Objects.

### UNIT – I:

**Introduction:** History of Python, Need of Python Programming, Advantages, Environment setup (Windows and Ubuntu), Interacting with Python using Command prompt, IDLE, Script mode.

**Basic Syntax:** Keywords, Identifiers, Quotations, Statements, Multi-line Statements, Indentation, Comments.

#### UNIT – II:

Variables and Types: Variables, Data Types- Strings, Numbers, Booleans, Date and Time. Lists, Tuples, Dictionaries.

## UNIT – III:

**Control Structures:** Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators. if, if-elif-else, for, while, break, continue, pass

#### UNIT – IV:

**Functions** – Defining Functions, Calling a Function, Function Arguments: Required arguments, Keyword arguments, Default Arguments, Variable-length arguments, Anonymous Functions, The Return Statement, Scope of the Variables in a Function - Global and Local Variables.

#### UNIT - V:

**Modules**: Defining module, namespacing, Importing modules and module attributes, from. Import statement, Module built-in functions, Introduction to Packages.

#### UNIT – VI

**Error and Exceptions:** Difference between an error and Exception, Detecting and Handling Exceptions, Raising Exceptions, Assertions, Built-in Exceptions, User Defined Exceptions

**Classes and Objects:** Overview of OOP terminology, Creating Classes, Creating Instance Objects, Inheritance, Overriding Methods, Overloading Methods, Operators, Data hiding.

## **TEXT BOOKS**

1. Core Python Programming, Wesley J. Chun, Pearson.

## **Reference Books:**

- 1. Python -The Ultimate Beginner's Guide!, Andrew Johansen
- 2. Learning Python, Mark Lutz, Orielly

## NOTE:

**Internal Assessment:** The question paper for sessional examination shall have one compulsory question carrying 6 marks and five other conventional (descriptive or analytical type) questions carrying 8 marks each. The compulsory question consists of objective type questions like the multiple choice, fill in the blanks etc. Apart from the compulsory question, the student has to answer any 3 from the remaining 5 conventional questions.

- 1 GE401Introduction to Psychology
- 2 GE402Research Methodology
- 3 GE403Entrepreneurship Development
- 4 GE404Intellectual Property Right and Patent Filing
- 5 GE405Constitution of India
- 6 GE406Ethical Hacking
- 7 GE407Information Security and Cyber Laws
- 8 GE408Foreign Languages
### **GE401: INTRODUCTION TO PSYCHOLOGY (IPY)**

### (Global Elective for B. Tech. – VII Semester)

Scheme	: 2013				
Internal assessment	: 100	L	T/D	Р	С
		2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Explain the primary objectives of psychology: describing, understanding, predicting and controlling behavior and mental processes.
- 2. Articulate the general history of psychology by explaining depth and breadth of the field from the field from the perspective of a future educator or researcher.

#### Unit: 1

**Introduction:** Defining Psychology & Behavior - Branches and fields of Psychology, Utility of Psychology.

**Methods of Psychology**: Introspection Method, Naturalistic observation, Experimental Method-Differential Method, Clinical Method, Psycho Physical Methods.

#### Unit: 2

**Physiological Basis of Behavior**: The Neuron-Central Nervous system, Brain and localization of Brain functions, Spinal chord Influence of Nervous system on human behaviour, Endocrine system and it's impact, The role of heredity and environment in the development of personality.

### Unit: 3

Instincts, Emotions Senses and Sensitivity: Instincts and Reflex actions-Emotion & it's characteristics-Physiology of Emotions-Sensation and Sensitivity.

#### Unit: 4

**Thinking, Reasoning and Problem solving**: Nature of thinking-Elements of thoughts, Tools of Thinking, Rigidity, Types of thinking, Reasoning & types, Problem solving and it's methods.

#### Unit: 5

**Motivation and Behavior & Attention & Learning:** Biological and socio psychological Needs, Drives and Incentives, Motives and Types of Motives, Types & Effect of attention, Types of Learning, Problem Solving, Mechanism of Memorization.

#### Unit: 6

**Intelligence, Aptitude, Personality :** Nature of Intelligence-Concept of Metal age and IQ-Constantly of IQ-IQ Classification, Aptitude Ability & Achievement, Measurement of Aptitude, Features and Characteristics of Personality, Personality Assessment, Walters social Learning Theory.

### **TEXT BOOKS:**

1.S.K. Mangal, "General Psychology", Sterling Publishers Private Limited

## **REFERENCE BOOK:**

1. Saundra K. Ciccarelli & Gkenn E.Meyer, "Psychology", Dorliing Kindersley (I) Pvt Limited

## NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### GE402: RESEARCH METHODOLOGY (RM)

(Global Elective for B. Tech. – VII Semester)

Scheme	: 2013				
Internal assessment	: 100	L	T/D	Р	С
		2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

Understand overview of research process, state research problem and conduct a
preliminary literature review of the concepts comprising the research questions.
Understand the limitations of research in social science, significance of economic research.

4. Understand the organization structure and style of report writing.

5.Understand that precautions which are to be taken while writing research report. 6.Understanding of the issues involved in planning, designing, executing, evaluating and reporting research.

### Unit: 1

**Research Methodology:** Introduction –Meaning-Objectives & Motivation of Research-Types & Significance of Research-Research Methods (Vs) Methodology.

Researching process-Technique involved in defining a problem-Definition of a

Hypothesis Role of Hypothesis-Types of Hypothesis-Criteria of Good Hypothesis.

### Unit: 2

**Research Design and Sampling Design:** Need for Research Design-Features of good Design-Concepts Related to Research Design-Different research designs-Basics Principles of Experimental Designs-Steps in sampling design-Characteristics of good sample design-Various types of sample designs-Complex Random sampling designs.

### Unit: 3

**Measurement and Scaling Techniques:** Errors in Measurement, Tests of Sound Measurement, Scaling and Scale Construction Techniques, Forecasting Techniques, Time Series Analysis, Interpolation and Extrapolation.

### Unit: 4

**Data Collection and Processing:** Primary Data: Data Collection through observation method & Interview Method-Data Collection through Questionnaires & schedules- Comparison of data collection methods- -Collection of Secondary data.

**Processing:**Measures of Central Tendency-Measures of Dispersion-Measures of Asymmetry - Measures of Relationship-Simple Regression Analysis-Chi-square Test for comparing valiance.

## Unit: 5

**Correlation and Regression Analysis:** Method of Least Squares, Regression Vs. Correlation, Correlation Vs Determination, Types of Correlation and Their Specific Applications. **Sampling Fundamentals:** Central Limit Theorem-Sampling Theory-Concept of standard error-Estimating population Mean-Sample size & Determination.

## Unit: 6

**Interpretation of Data and Report Writing:** Meaning-Technique & precautions of Interpretation Significance of Report writing, Steps- Layout of a Research report, -Types of Reports-Mechanics of writing a Research Report- Precautions of Report Writing.

## **TEXT BOOKS:**

1. C.R. Kothari, "Research Methodology (Methods & Techniques)", New Age International Publishers.

### **REFERENCE BOOKS:**

1. R. Cauvery, V. K. Sudha Nayak, M. Girija, "Research Methodology", S. Chand Publications.

## NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### GE403: ENTREPRENUERSHIP DEVELOPMENT (ED)

### (Global Elective for B. Tech. – VII Semester)

Scheme	: 2013	L	T/D	Р	С
Internal assessment	: 100	2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the personal as well as external resources with a view to successfully launching and subsequently managing the enterprises.
- 2. Understand entrepreneurial culture, competencies needed for setting up small enterprises.

#### Unit: 1

**Introduction:** Concept of an entrepreneur; Definition of an entrepreneur; Types of entrepreneurs; Characteristics of an entrepreneur.

**Entrepreneurship:** Definitions; Theories of entrepreneurship; Key elements of entrepreneurship; Six important segments of entrepreneurship environment; Advantages of entrepreneurship; Barriers to entrepreneurship; Role of entrepreneurship in economic development.

#### Unit: 2

**Rural Entrepreneurship:** Meaning; Need; Retrospection of rural industrialization in India; Problems of rural entrepreneurship; Development plan for rural entrepreneurship.

**Small Enterprises :**Definition of SSI; Types, Characteristics of SSI; Role of SSI in economic development; Problems faced by SSI.

#### Unit: 3

**Project Planning:** Project Identification; Project Selection; Project Report – Contents & Formulation; Methods of Project Appraisal.

#### Unit: 4

**Ownership Structures**: Sole Proprietorship; Partnership; Company; Co-operative; Selection of appropriate ownership structure.

#### Unit: 5

**Institutional Finance:** Commercial banks; Other Financial Institutions – IDBI, IFCI, ICICI, IRBI, SFC, SIDC, SIDBI & EXIM Bank.

#### Unit: 6

**Institutional Support:** Need; Support to Small Entrepreneurs – NSIC, SIDO, SSIB, SSIDC, SISI, DICs.

### **TEXT BOOKS:**

- 1. Prof. Satish C. Ailawadi& Mrs. Romy Banerjee, "Principles of Entrepreneurship", Everest Publishing HousePub.
- 2. S.S. Khanka, "Entrepreneurial Development", S. Chand & Company Ltd. Pub.

## **REFERENCE BOOKS:**

- 1. Prof. Satish C. Ailawadi& Mrs. Romy Banerjee, "Principles of Entrepreneurship", Everest Publishing House Pub.
- 2. S.S. Khanka, "Entrepreneurial Development", S. Chand & Company Ltd. Pub.

### NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### **GE404: INTELLECTUAL PROPERTY & PATENT FILING (IPPF)**

### (Global Elective for B. Tech. – VII Semester)

Scheme	: 2013				
Internal assessment	: 100	L	T/D	Р	С
		2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Acquire fundamental competencies with regard to intellectual property rights.
- 2. Understand IP basic legal concepts of Intellectual Property and Patent Filing.

#### Unit: 1

**Basics of IPR**: Introduction to intellectual property right (IPR) -Need for IPR in India-Systems-Benefits of IPR-Various Types of IPR-Violation of IPR.

### Unit: 2

**Patents:** Introduction to Patents-Various kinds of Patents-Patenting Process-Patent and kind of inventions protected by patent- Patent documents- How to protect your inventions? -Granting of patent Rights of a patent -How extensive is patent protection-Searching a patent -Drafting of a patent.

#### Unit: 3

**Copy Right:** What is copyright?- What is covered by copyright?- Fair use of copyrighted works (e.g., for classroom use)-Contributory copyright infringement -Rights covered by copyright?- Critical differences between patent and copyright protection-Copyright infringement distinguished from plagiarism- Remedies against Infringement.

#### Unit: 4

**Method of Designing Registrations**: Designing Registrations-How Chart for Registration-Trade Mark-Geographical Indications Integrated Circuits-Trade Secrets.

### Unit: 5

**IPR Policy:** IP in various sectors like Government and Nation-R &D organizations-IT, Media,Entertainment.

#### Unit: 6

Management of Intellectual Property Rights-Trademarks, Geographical Indications and Domain Names-Chemical Engineering & Services Sector-Industries & Small Scale Industry

### **TEXT BOOKS:**

- 1. "Intellectual Property Rights: Key to New Wealth", National Research Development Corporation
- 2. PrabuddhaGanguli, "Intellectual Property Rights", TMH

### **REFERENCE BOOKS:**

1. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi , 2010

#### NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### **GE405: CONSTITUTION OF INDIA (CI)**

### (Global Elective for B. Tech. – VII Semester)

Scheme	: 2013					
Internal assessment	: 100		L	T/D	Р	С
			2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand the basic philosophical tenets of Indian Constitutional Law.
- 2. Understand how constitution governs the allocation of power in society and the way in which the Indian constitution was made.

#### Unit: 1

Historical back ground, Significance of Constitution, Making of the constitution, Role of the constituent Assembly, Salient features, the Preamble, Citizenship, procedure for amendment of Constitution Fundamental rights-Derivative principles of state policy-Elections in India.

#### Unit: 2

**Union Executive:** Structures of Union Government & Functions, President, Vice President, Prime Minister, Cabinet Parliament-Supreme Court of India.

#### Unit: 3

State Executive: Structures and Functions, Governor, Chief Minister, Cabinet, State Legislature, High Courts & Sub ordinate courts.

#### Unit: 4

Central, State Relations, President's Rule, Constitutional Amendments [42, 44, 74, 76, 86 & 91]-Constitutional functionaries, Working of Parliamentary system in India.

#### Unit: 5

Nature, Meaning & Definition, Indian Social Structure, Language in India-Political Parties & Presume groups, Right of Women-S.C's, S.T's & other weaker sections.

#### Unit: 6

Judiciary: Structure, Organisation of Judiciary, independence of the Judiciary, role and functions of Supreme Court, Judicial Review.

#### **TEXT BOOKS:**

- 1. Durga Das Basu, "Introduction to the Constitution of India", Wedwe& Company
- 2. Macivel, Page, "An Introduction Analysis", Society
- 3. M.V. Pylee, "Indian Constitution", S. Chand Publications
- 4. Subhash C Kashyao : "Our Constitution", National Bank, Trust, India.

### **REFERENCE BOOKS:**

- 1. Durga Das Basu, "Introduction to the Constitution of India", Wedwe& Company
- 2. Macivel, Page, "An Introduction Analysis", Society

## NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### GE 406: ETHICAL HACKING (EH)

### (Global Elective for B. Tech. – VII Semester)

Scheme	: 2013				
Internal assessment	: 100	L	T/D	Р	С
		2	-	-	2

Course Outcomes: Upon successful completion of this course, the student shall be able to

- 1. Understand Ethical Hacking Terminologies.
- 2. Classify Types of Attacks and Commandments present in Ethical Hacking.
- 3. Interpret how Ethical Hackers think like Malicious users.
- 4. Demonstrate how to Gather Public information and map it with networks for finding Vulnerabilities.
- 5. Understand the ways of cracking passwords using kinds of tools

6.Summarize the ways of hacking Accounts, Laptops, Mobiles, Systems Passwords using Command Prompt and Tools.

### Unit: 1

**Introduction To Ethical Hacking :**Basic Terminology, Defining Hacker, Defining Malicious User, Recognizing How Malicious User Beget Ethical Hacker, Ethical Hacking Vs Auditing, Policy Considerations, Compliance And Regulatory Concerns, Understanding The Need To Hack Your <u>Own</u> Systems, Understanding The Dangers Your Systems Face, N —

### Unit: 2

**Attacks And Ethical Hacking Commandments:** Non Ethical Attacks, Network Infrastructure Attacks, Operating System Attacks, Applications And Other Specialized Attacks, Working Ethically, Respecting Privacy, Not Crashing Your Systems, Using The Ethical Hacking Process, Formulating Your Plan, Selecting Tools, Executing The Plan, Evaluating Results.

### Unit: 3

**Cracking The Hackers Mindset And Ethical Hacking Plan :**Think Like Bad Guys, Who Breaks Into Computer Systems, Why They Do It, Planning And Performing Attacks, Maintaining Anonymity, Establishing Your Goals, Determining Which System Hack, Creating Testing Standards, Timing, Running Specific Tasks, Blind Vs Knowledge Assessments, Picking Your Location, Respond The Vulnerabilities, Selecting Security Assessment Tools.

#### Unit: 4

**Hacking Methodology :**Setting The Stage For Testing, Gathering Public Information, Mapping The Networks, Scanning Systems, Determining What's Running On Open Ports, Assessing Vulnerabilities.

### Unit: 5

**Passwords:** Understanding Password Vulnerabilities, Organizational Password Vulnerabilities, Technical Password Vulnerabilities, Cracking Passwords, Cracking The Passwords The Old Fashioned Way, Cracking The Passwords With High-Tech Tools, Cracking Password Protected Files, Understanding Other Ways To Crack Passwords, General Password Cracking Countermeasures.

#### Unit: 6

Mobile Devices: Cracking Laptop Passwords, Cracking Phones And Tablets, Cracking ios Passwords.

#### **TEXT BOOKS:**

1. Kevin Beaver, "Hacking for dummies", 4<sup>th</sup> Edition, Wiley India Pvt.Ltd.

#### **REFERENCE BOOKS:**

1. RafayBaloch "A Beginners guide to ethical hacking", www.hacking-book.com.

#### NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.

### GE 407: INFORMATION SECURITY AND CYBER LAWS (ISCL)

### (Global Elective for B. Tech. – VII Semester)

Scheme : 2013

Internal Assessment • 100	L	T/D	Р	С
	2	0	0	2

**Course Outcomes:**Upon successful completion of this course, the student shall be able to

- 1. Understand Basics , importance and threats related to information systems.
- 2. Explains Intrusion Monitoring and Detection for securing networks
- 3. Understand firewall and VPN techniques
- 4. Understand about the security flaws in Databases system, Email's
- 5. Understand Methodologies, framework for Information system security and the Role of Operating System in Information system.
- 6. States about cyber laws, patents and copyright

#### Unit: 1

**Information Systems in Global Context:** Basics and importance of Information Systems, Changing Nature of Information Systems, Global Information Systems: Role of Internet and Web Services.

**Threats to Information Systems:** New Technologies Open Door to the Threats, Information-Level Threats versus Network-Level Threats, Threats and Attacks, Classifications of Threats and Assessing Damages, Protecting Information Systems Security.

### Unit: 2

**Building Blocks of Information Security:** Principles of Information Systems Security, Three Pillars of Information Security.

**Intrusion Detection for Securing the Networks:** Intrusion Monitoring and Detection, Intrusion Detection for Information Systems Security.

### Unit: 3

**Firewalls for Network Protection:** Firewalls, Demilitarized Zone (DMZ), Need and Protection provided by Firewalls, Proxy Servers, Topologies for Different Types of Firewalls.

**Virtual Private Networks for Security:** VPN, Need and Role of a VPN for an Enterprise, Working of VPN, VPN Architecture.

Unit: 4

Security of Electronic Mail Systems: Today's Email Usage Scenario, Email System Mechanism, Security Threats posed by Emails, Protection from Threats, Governance for Emails Systems. Security of Databases: Database Security Issues, Federated Databases: Need and Security Issues, Securing the Mobile Databases, Securing Connectivity with Enterprise Databases, Data Integrity as a parameter for security, Database Security Policy.

### Unit: 5

**Security of Operating Systems:** Operating Systems role in Information Systems Application, Operating System Types, Functions and Tasks, Network Operating Systems and Security, Host Security and OS Hardening, Patched Operating System, OS hardening fundamentals.

**Security Models, Frameworks, Standards and Methodologies:** Terminology, Methodologies for Information Systems Security.

## Unit: 6

**Introduction To Cyber Laws:** Introduction to Indian Cyber Law, Objective and Scope of the IT Act, 2000, Intellectual Property Issues, Overview of Intellectual-Property- Related Legislation in India, Patent, Copyright, Law Related to Semiconductor Layout and Design, Software License

# **TEXT BOOKS:**

- 1. Nina God bole, "Information Systems Security: Security Management, Metrics, Frameworks and Best Practices", Wiley India Pvt.Ltd., 2013.
- 2. Surya Prakash Tripati, RitendraGoel, Praveen Kumar Shukla "Introduction To Information Security And Cyber Laws", Wiley India Pvt.Ltd.,2014.

## **REFERENCE BOOKS:**

1. Michael E. Whitman and Hebert J Mattord, "Principles of Information Security", 4th edition Ed. Cengage Learning 2011

## NOTE:

**INTERNAL ASSESSMENT:** Two Internal Examinations will be conducted for 50 Marks each. The Question paper consists of SIX questions. The FIRST question is compulsory. It consists of 10 questions of two marks each. Four questions to be answered from the remaining five questions and each question carries 7.5 marks.