NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)

Erode-638 052, Tamilnadu, India, Phone: 04294 – 225585

Curriculum and Syllabi
for
Master of Computer Applications [R13]

(This Curriculum and Syllabi are applicable to Students admitted from the academic year 2013-2014 to 2014-2015)

JUNE 2015

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Approved by Third Academic Council

NANDHA ENGINEERING COLLEGE
(Autonomous Institution Affiliated to Anna University, Chennai)
DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS
(For the students admitted during 2013-2014 and onwards)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The following Programme Educational Objectives are designed for M.C.A. programme in Computer Applications based on the Department Mission to provide higher education and motivate research in the field of Computer Applications

PEO1   To excel in fundamentals, problem solving and programming skills in the various computing fields of IT Industries or for to pursue higher studies in the fields of teaching and research.

PEO2   To demonstrate the capabilities in scientific knowledge, logical thinking and fundamental concepts of Computer Application.

PEO3   To develop the ability to plan, analyze, design, code, test, implement & maintain software products for real time system.

PEO4   To experience the students in finding solutions and developing system based applications for real time problems in various domains involving technical, managerial, entrepreneurial, economical & social constraints.

PROGRAMME OUTCOMES (POs)

Students in the Department of Computer Applications M.C.A programme should at the time of their graduation are in possession of:

PO1.   Understand and Apply mathematical foundation, computing and domain knowledge for the conceptualization of computing model of problems.

PO2.   Identify, Analyze the computing requirements of a problem and solve them using computing principles.

PO3.   Design and Evaluate a computer based system, components and process to meet the specific needs of applications.

PO4.   Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

PO5.   Apply understanding of management principles with computing knowledge to manage projects in multidisciplinary environments.

PO6.   Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

PO7.   Understand economical, environmental, social, health, legal, ethical issues within local and global contexts and consequential responsibilities relevant to professional practice.

PO8.   Function effectively in a team environment to accomplish a common goal.

PO9.   Identify opportunities and use innovative ideas to create value and wealth for the betterment of the individual and society.

PO10.   Use knowledge to analyze, interpret the data and synthesis the information to derive valid conclusions using research methods.

PO11.   Ability to use the techniques, skills, and be familiar with modern software tools necessary for Computer Application practice.

PO12.   Expertise in developing application with required domain knowledge.

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SEMESTER I

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA101	Computer Organization	3	0	0	3
13CA102	Problem Solving Techniques	3	0	0	3
13CA103	Programming in 'C'	3	0	0	3
13CA104	Data Structures	3	1	0	4
13CA105	Accounting and Financial Management	3	1	0	4

PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA111	Programming in C Laboratory	0	0	3	2
13CA112	Data Structures Laboratory	0	0	3	2
13CA113	Office Automation Laboratory	0	0	3	2
	TOTAL	**15**	**2**	**9**	**23**

SEMESTER II

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA201	Mathematical Foundations of Computer Science	3	1	0	4
13CA202	Object Oriented Programming	3	0	0	3
13CA203	Design and Analysis of Algorithms	3	1	0	4
13CA204	System Software	3	0	0	3
13CA205	Operating Systems	3	0	0	3

PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA211	Object Oriented Programming Laboratory	0	0	3	2
13CA212	System Software Laboratory	0	0	3	2
13CA213	Algorithms Laboratory	0	0	3	2
	TOTAL	**15**	**2**	**9**	**23**

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THEORY

Course Code	Course Title	L	T	P	C
13CA301	Computer Networks	3	0	0	3
13CA302	Database Management Systems	3	0	0	3
13CA303	Software Engineering	3	0	0	3
13CA304	Java Programming	3	0	0	3
13CA305	Object Oriented Analysis and Design	3	0	0	3

PRACTICAL

Course Code	Course Title	L	T	P	C
13CA311	Database Management Systems Laboratory	0	0	3	2
13CA312	Java Programming Laboratory	0	0	3	2
13CA313	CASE Tools Laboratory	0	0	3	2
13PT312	Language Competency Development	0	0	2	0
	TOTAL	15	0	11	21

SEMESTER IV

THEORY

Course Code	Course Title	L	T	P	C
13CA401	Network Programming	3	0	0	3
13CA402	Resource Management Techniques	3	0	0	3
13CA403	.NET Framework	3	0	0	3
13CA404	Open Source Systems	3	0	0	3
E1	Elective I (PE)	3	0	0	3

PRACTICAL

Course Code	Course Title	L	T	P	C
13CA411	Network Programming Laboratory	0	0	3	2
13CA412	. NET Framework Laboratory	0	0	3	2
13CA413	Open Source Systems Laboratory	0	0	3	2
13PT412	Verbal , APPS, Reasoning Training	0	0	2	0
	TOTAL	15	0	11	21

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SEMESTER V

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA501	Software Testing	3	0	0	3
13CA502	Software Project Management	3	0	0	3
E2	Elective – II (PE)	3	0	0	3
E3	Elective – III (PE)	3	0	0	3
E4	Elective – IV (Industrial Elective)	3	0	0	3

PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA511	Software Testing Laboratory	0	0	3	2
E3L	Elective -III Laboratory	0	0	2	1
13CA512	Mini Project	0	0	2	1
13PT512	Language and Career Proficiency	0	0	2	0
	TOTAL	**15**	**0**	**9**	**19**

SEMESTER VI

PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CA631	Project Work	0	0	24	12
	TOTAL	**0**	**0**	**24**	**12**

Total Credits: 23+23+21+21+19+12 = 119

*PE- Professional Elective

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LIST OF PROFESSIONAL ELECTIVES FOR E1

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CAX01	Data Mining And Data Warehousing	3	0	0	3
13CAX02	Electronic Commerce	3	0	0	3
13CAX03	Mobile Computing	3	0	0	3
13CAX04	Computer Graphics and Multimedia Systems	3	0	0	3
13CAX05	Principles of Management	3	0	0	3

LIST OF PROFESSIONAL ELECTIVES FOR E2

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CAX06	Cloud Computing	3	0	0	3
13CAX07	Ethical Hacking	3	0	0	3
13CAX08	Parallel and Distributed Computing	3	0	0	3
13CAX09	Web Mining	3	0	0	3
13CAX10	Soft Computing	3	0	0	3

LIST OF PROFESSIONAL ELECTIVES FOR E3

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CAX11	Advanced Database Management System	3	0	0	3
13CAX12	Advanced Open Source Database	3	0	0	3
13CAX13	Dynamic Programming	3	0	0	3
13CAX14	Scripting Language Programming	3	0	0	3
13CAX15	J2EE Technologies	3	0	0	3

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LIST OF PROFESSIONAL ELECTIVES FOR E4

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CAX16	Mobile Apps Development	3	0	0	3
13CAX17	Designing Enterprise Applications	3	0	0	3

LIST OF PROFESSIONAL ELECTIVES FOR E3L

PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13CAW01	Advanced Database Management System Laboratory	0	0	2	1
13CAW02	Advanced Open Source Database Laboratory	0	0	2	1
13CAW03	Dynamic Programming Laboratory	0	0	2	1
13CAW04	Scripting Language Programming Laboratory	0	0	2	1
13CAW05	J2EE Technologies Laboratory	0	0	2	1

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	L	T	P	C
13CA101 **COMPUTER ORGANIZATION**	3	0	0	3

OBJECTIVES :

To introduce students with principles of Digital Systems, apply in the design and application of computer systems and to study property and realization of the various logic gates. To provide an overview of the design of Combinational and Sequential Systems and design different logic systems such as Memory elements

LEARNING OUTCOMES:

At the end of the course the students would be able
- To learn the basic methods for the design of digital circuits
- To understand different methods used for the simplification of Boolean functions
- To outline the formal procedures for the analysis and design of combinational circuits
- To introduce the concept of memories and programmable logic devices

UNIT I   **DIGITAL FUNDAMENTALS**   **(8)**

Number Systems and Conversions – Boolean Algebra and Simplification – Minimization of Boolean Functions – Karnaugh Map, Logic Gates – NAND – NOR Implementation.

UNIT II   **COMBINATIONAL AND SEQUENTIAL CIRCUITS**   **(10)**

Design of Combinational Circuits – Adder / Subtracter – Encoder – Decoder – MUX / DEMUX – Comparators, Flip Flops – Triggering – Master – Slave Flip Flop – State Diagram and Minimization – Counters – Registers.

UNIT III   **BASIC STRUCTURE OF COMPUTERS**   **(9)**

Functional units – Basic operational concepts – Bus structures – Performance and Metrics – Instruction and instruction sequencing – Hardware – Software Interface – Addressing modes – Instructions sets – RISC and CISC – ALU design – Fixed point and Floating point operation.

UNIT IV   **PROCESSOR DESIGN**   **(9)**

Processor basics – CPU Organization – Data path design – Control design – Basic concepts – Hard wired control – Micro programmed control – Pipeline control – Hazards – Super scalar operation.

UNIT V   **MEMORY AND I/O SYSTEM**   **(9)**

Memory technology – Memory systems – Virtual memory – Caches – Design methods – Associative memories – Input/Output system – Programmed I/O – DMA and Interrupts – I/O Devices and Interfaces.

TOTAL = 45

Approved in the Second Governing Body

TEXT BOOKS :

1. Morris Mano, "Digital Design", Prentice Hall of India, Fourth Edition, 2007.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Tata McGraw Hill, Fifth Edition, 2002.

REFERENCES :

1. Charles H. Roth, Jr., "Fundamentals of Logic Design", Jaico Publishing House, Mumbai, Eighth Edition, 2004.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", Pearson Education, Eighth Edition, 2010.
3. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", Morgan Kaufmann, Fourth Edition, 2010.
4. John P. Hayes, "Computer Architecture and Organization", Tata McGraw Hill, Third Edition, 1998.

13CA102 **PROBLEM SOLVING TECHNIQUES** **L   T   P   C**
3   0   0   3

OBJECTIVES:

This course aims to provide deep knowledge about various methods and techniques improves logical thinking that is needed for computer programming.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To study the fundamentals of algorithms and its efficiency
- To understand and know how to use factoring methods
- To know about array techniques and use it.
- To know various sorting and searching techniques.
- To get knowledge about various text processing and pattern searching.

UNIT - I   INTRODUCTION TO COMPUTER PROBLEM-SOLVING   (9)

Introduction – The Problem-Solving Aspect – Top-down Design-Implementation of Algorithms - Program Verification – The Efficiency of Algorithms. Fundamental Algorithms – Exchanging the values of Two Variables – Counting – Summation of set of Numbers – Factorial Computation-Sine function computation – Generation of the Fibonacci sequence – Reversing the Digits of an Integer – Base Conversion Character to Number conversion.

UNIT - II   FACTORING METHODS   (9)

Finding the square Root of a number – The Smallest Divisor of an Integer – The Greatest Common Divisor of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer Generation of Pseudo–random Numbers – Raising a Number to a Large Power – Computing the nth Fibonacci Number.

UNIT - III   ARRAY TECHNIQUES   (9)

Array Order Reversal - Array Counting or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding the kth Smallest Element – Longer Monotone Subsequence.

UNIT - IV   SORTING AND SEARCHING   (9)

The Two-way Merge – Sorting by Selection - Sorting by Exchange - Sorting by Insertion – Sorting by Diminishing Increment – Sorting by Partitioning – Binary search – Hash Searching.

UNIT - V   TEXT PROCESSING AND PATTERN SEARCHING   (9)

Text Line Length Adjustment – Left and Right Justification of Text – Keyword Searching in Text-Text Line editing – Linear Pattern Search – Sub Linear Pattern Search.

TOTAL = 45

REFERENCES:

1. R.G. Dromey " How to solve it by Computer ", Pearson Education, India, 2007.

2. Seymour Lipschutz, "Essentials of Computer Mathematics", Schaums' outlines series, Tata McGrawHill Edition, 2004.

	L	**T**	**P**	**C**

13CA103   **PROGRAMMING IN 'C'**   **3   0   0   3**

OBJECTIVE:

This course aims to provide basic concepts of 'C' language and gain knowledge about functions, arrays, pointers and file concepts.

LEARNING OUTCOMES:

At the end of the course the students would be able
- To develop background and basic knowledge about the C language.
- To understand and use of arrays and functions.
- To know about structures and unions.
- To get a deep knowledge about the pointers and files.

UNIT I   INTRODUCTION TO C LANGUAGE   **(9)**

Overview of 'C' language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/output Operations – Formatted I/O – Decision Making – Branching – IF, Nested IF – Switch – go to – Looping – while, do, for statements.

UNIT II   ARRAYS AND FUNCTIONS   **(9)**

Arrays – dynamic and multi-dimensional arrays – Character arrays and Strings – String handling Functions – User defined Functions – Categories of Functions – Recursion.

UNIT III   STRUCTURES AND UNIONS   **(9)**

Basics of Structures-Declaring a Structure – Array of Structures – Passing Structures elements to Functions- Passing entire Structure to Function – Structures within Structures – Union – Union of Structures – Enumerated Data Types – typedef Statement.

UNIT IV   POINTERS   **(9)**

Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers vs. Arrays, Array of Pointers, Pointers of functions and Structure Pointers.

UNIT V   FILE MANAGEMENT   **(9)**

File Management in C – Data hierarchy – Files and Streams – Sequential access file – Random access file - Pre-processors.

TOTAL = 45

REFERENCES:

1. E. Balagurusamy, " Programming in ANSI C ", Tata Mcgraw Hill, 2004.
2. Yashavant P. Kanetkar, "Understanding Pointers In C", BPB Publications, New Delhi, 2002.
3. Byron C Gottfried, "Programming with C", Schaum's outline series, 2nd edition, Tata Mcgraw Hill, 2006.

13CA104   **DATA STRUCTURES**   **L   T   P   C**

                                                                    3   1   0   4

OBJECTIVE:

To provide the students a clear knowledge about different types of data structures and how to implement them using a programming language.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To understand the various ADTs so as to use them in program design.
- To design algorithms to various problems based on the design strategies.
- To analyze algorithms to find out their time complexity.
- To understand different types of algorithms specifically available for sorting and searching, and how they can be applied on different types of data structures.
- To efficiently implement the different data structures

UNIT I   DATA STRUCTURES   (12)

Introduction – Arrays – Structures – Stack: Definition and examples, Representing Stacks - Queues and lists: Queue and its Representation, lists – Applications of Stack, Queue and Linked Lists.

UNIT II   TREES   (12)

Binary Trees- Operations of binary trees – Binary Tree Representations – node Representation , internal and external nodes, implicit array representation – Binary tree Traversals – Huffman Algorithm – Representing Lists as Binary Trees.

UNIT III   SORTING AND SEARCHING   (12)

General Background – Exchange sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – Basic Search Techniques – Tree Searching – General Search Trees – Hashing.

UNIT IV   GRAPHS AND THEIR APPLICATIONS   (12)

Graphs – An application of graphs – Representation – transitive closure – Warshall's algorithm – Shortest path algorithm – a flow Problem – Dijkstra's algorithm – An application of scheduling – Linked representation of Graphs – Graph Traversals

UNIT V   STORAGE MANAGEMENT   (12)

General Lists: Operations, linked list representation, using lists, Freeing list nodes - Automatic list Management: Reference count method, Garbage Collection, Algorithms, Collection and compaction

                                                               TOTAL = 60

TEXT BOOK:

1. Tanaenbaum A.S.,Langram Y. Augestein M.J, "Data Structures using C", Pearson Education, First Edition, 2004.

REFERENCES:

1. Robert Kruse & Clovis L. Tondo, "Data Structures and Program Design in C"**,** Prentice Hall , Second Edition, 2007.
2. Weiss, "Data Structures and Algorithm Analysis in C", Addison Wesley, Second Edition, 2007.

	L	T	P	C

13CA105   ACCOUNTING AND FINANCIAL MANAGEMENT

L   T   P   C

3   1   0   4

OBJECTIVES:

To make the students expose to the various accounting systems, accounting control and linking the accounting systems to the management decision making.

LEARNING OUTCOMES:

- To introduce prospective managers of new ventures to prepare and analyze financial statements.
- The course emphasis on techniques, cash flows, and impact of accounting principles. Coverage of management control systems including: planning, budgeting, reporting, analysis, and performance Evaluation.

UNIT I   FINANCIAL ACCOUNTING   (12)

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Final Accounts -Trail Balance-Trading Account-Profit and Loss Account-Balance Sheet-Accounting Ratio Analysis-Funds Flow Analysis-Cash Flow Analysis

UNIT II   ACCOUNTING   (12)

Meaning-OBJECTIVES :-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume - Profit Analysis – Break Even Analysis -Applications-Limitations-Standard Costing and Variance Analysis – Material – Labor-Overhead – Sales-Profit Variances

UNIT III   BUDGETS AND BUDGETING CONTROL   (12)

Budgets and Budgetary Control – Meaning – Types – Sales Budget – Production Budget – Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting – Computerized Accounting

UNIT IV INVESTMENT DECISION AND COST OF CAPITAL   (12)

OBJECTIVES : and Functions of Financial Management-Risk-Return Relationship-Time Value of Money Concepts – Capital Budgeting - Methods of Appraisal-Cost of Capital Factors affecting Cost of Capital – Computation for each source of Finance and Weighted Average cost of capital.

UNIT V   FINANCING DECISION AND WORKING CAPITAL MANAGEMENT   (12)

Capital Structure-Factors affecting capital structure-Dividend Policy-Types of Dividend Policy – Concepts of Working Capital - Working Capital Policies-Factors affecting Working Capital- Estimation of Working Capital Requirements

TOTAL = 60

TEXT BOOKS:

1. S.N.Maheswari, "Financial and Management Accounting", Sultan Chand & Sons, Fifth Edition, 2003.
2. I.M.Pandey, "Financial Management", Vikas Publications, Ninth Edition, 2002.

REFERENCES:

1. Gupta, "Cost and Management Accounting", Kalyani Publications, First edition, 2003.
2. Srinivasan and Ramachandran, "Financial Management", Sriram Publications, Fourth Edition, 2012.

13CA111   **PROGRAMMING IN C LABORATORY**

	L	T	P	C
	0	0	3	2

OBJECTIVES:

To implement the applications using branching and looping statements, string functions, arrays, functions, pointers and file concepts.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able
- To develop programs using the C language.
- To write programs using of arrays and functions.
- To write programs using structures and union.
- To get a deep practical knowledge about the pointers and files.

1. Display the following:

> (i) Floyd's triangle

> (ii) Pascal Triangle

2. Generate the following series of numbers:

> (i) Armstrong numbers between 1 to 100

> (ii) Prime numbers between 1 to 50

> (iii) Fibonacci series up to N numbers

3. Manipulate the strings with following operations.

> (i) Concatenating two strings

> (ii) Reversing the string

> (iii) Finding the substring

> (iv) Replacing a string

> (v) Finding length of the string

4. Find the summation of the following series:

> (i) Sine   (ii) Cosine   (iii) Exponential

5. Create the sales report for M sales persons and N products using two dimensional array.

6. Simulate following Banking operations using functions.

> (i)Deposit   (ii) Withdrawal   (iii) Balance Enquiry

7. Implement using recursion

> (i) Find the solution of Towers of Hanoi problem using recursion.

> (ii) Fibonacci number generation.

> (iii) Factorial

8. Generate Student mark sheets using structures.

9. Create a collection of books using arrays of structures and do the following:

(i) Search a book with title and author name (ii) Sorts the books on title.

10. Perform string operations using pointers.

11. Program to implement dynamic memory allocation.

12. Creating, Reading and displaying a sequential and random access file.

13CA112	**DATA STRUCTURES LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

OBJECTIVE:

To implement the concepts of arrays Linked lists, Trees, Searching and Sorting Techniques.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To write the program for arrays linked lists.
- To develop programs for Searching and Sorting.
- To develop programs for different types of algorithms.

To write a program for the following concepts using C language.

1. Stack and Queue
2. Linked List
3. Binary tree Traversals
4. Merge Sort
5. DFS and BFS
6. Warshall's Algorithm
7. Dijkstra's Algorithm
8. Floyd's Algorithm
9. Huffman's Algorithm
10. Insertion Sort

13CA113	**OFFICE AUTOMATION LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

OBJECTIVE:

To learn about Microsoft Word, Excel, Power Point, Access and Tally.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To create documents with simple formatting, merge files and working with tables.
- To create Excel documents, presentation charts and what-if analysis.
- To develop Presentation with animation, text and images and self running presentations.
- To develop the Trading and Profit and Loss accounts, balance sheets using Tally.

MICROSOFT WORD

1. Creating and formatting a simple document (using Bulleted and Numbered list, adding Headers, Footers and Page numbers).
2. Working with Tables (Creating tables, Editing tables, Formatting tables, Converting tables, Sorting table contents, etc.)
3. Mail Merge

MICROSOFT EXCEL

4. Formatting the worksheets (Formatting the cells, rows and columns) & working with Functions and formulae.
5. Presenting Data with charts, performing What – If analysis with Data table & Summarizing the data using Pivot table.

MICROSOFT POWER POINT

6. Presentation of Animation with Text, Images and Media file.
7. Creating PowerPoint Slides with graph, creating self running Presentations & Hiding and Showing the slides.

MICROSOFT ACCESS

8. Creating a Database with key and field properties setting & Entering and Editing data using Forms.
9. Retrieving data from more than one related table using Queries & Generating Report using Report Wizards.

TALLY

10. Creation of Accounts Masters, Accounts Voucher with Voucher Entry, conversion, Interest Calculation & Printing of voucher using Tally.
11. Creation of Trading Account, Profit/Loss Account & Balance Sheet using Tally.

		L	**T**	**P**	**C**

13CA201   MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

3   1   0   4

OBJECTIVE:

The course aims to provide necessary mathematical support and confidence to tackle the real life problems and getting prepared for industry demands for engineers.

LEARNING OUTCOMES:

At the end of the course the students would be able
- To understand matrix and its usage in data representation
- The fundamental models of computation that underline modern computer hardware, software and programming languages.
- To earn the foundations of automata theory, computability theory and complexity theory.

UNIT I   MATRIX ALGEBRA   (12)
Matrices, Rank of Matrix, Solving System of Equations-Eigen Values and Eigen Vectors- Inverse of a Matrix – Cayley Hamilton Theorem

UNIT II   BASIC SET THEORY   (12)
Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion - partitions- Permutation and Combination - Relations-Properties of relations - Matrices of relations - Closure operations on relations - Functions - injective, surjective and bijective functions.

UNIT III   MATHEMATICAL LOGIC   (12)
Propositions and logical operators - Truth table - Propositions generated by a set, Equivalence and implication - Basic laws- Some more connectives – Functionally complete set of connectives – Normal forms – Proofs in Propositional calculus – Predicate calculus.

UNIT IV   FORMAL LANGUAGES   (12)
Languages and Grammars-Phrase Structure Grammar-Classification of Grammars - Pumping Lemma For Regular Languages- Context Free Languages.

UNIT V   FINITE STATE AUTOMATA   (12)
Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA)- Equivalence of DFA and NFA-Equivalence of NFA and Regular Languages.

TOTAL = 60

REFERENCES :

1. Kenneth H.Rosen,, " Discrete Mathematics and Its Applications", Tata McGraw Hill, Fourth Edition, 2002 (Unit 1,2 & 3).
2. Hopcroft and Ullman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, Delhi, 2002. (Unit 4, 5).
3. A.Tamilarasi & A.M.Natarajan, "Discrete Mathematics and its Application", Khanna Publishers, Second Edition 2005.
4. M.K.Venkataraman, "Engineering Mathematics", Volume II, National Publishing Company, Second Edition, 1989.

13CA202   **OBJECT ORIENTED PROGRAMMING**

L   T   P   C

3   0   0   3

OBJECTIVE:

To provide knowledge about object oriented programming concepts and language paradigms.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To introduce Object Oriented Programming Concepts with special emphasis on Object Oriented Programming in C++.
- To explore and implement the various features of OOP such as inheritance, polymorphism, Exceptional handling using programming language C++.

UNIT I   FUNDAMENTALS   **(9)**

Object–Oriented Programming concepts – Encapsulation – Programming Elements – Program Structure – Enumeration Types — Functions and Pointers – Function Invocation – Overloading Functions – Scope and Storage Class – Pointer Types – Arrays and Pointers – Call–by–Reference – Assertions – Standard template library.

UNIT II   IMPLEMENTING ADTs AND ENCAPSULATION   **(9)**

Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – reference semantics – implementation of simple ADTs.

UNIT III   POLYMORPHISM   **(9)**

ADT Conversions – Overloading – Overloading Operators – Unary Operator Overloading – Binary Operator Overloading – Function Selection – Pointer Operators – Visitation – Iterators – Containers – List – List Iterators.

UNIT IV   TEMPLATES   **(9)**

Template Class – Function Templates – Class Templates - Parameterzing – STL – Algorithms – Function Adaptors.

UNIT V   INHERITANCE   **(9)**

Derived Class – Typing Conversions and Visibility – Code Reuse – Virtual Functions – Templates and Inheritance – Run–Time Type Identifications – Exceptions – Handlers – Standard Exceptions.

TOTAL = 45

REFERENCES:

1. Ira Pohl, "Object–Oriented Programming Using C++", Pearson Education, Second Edition, 2003.
2. Stanley B.Lippman, Josee Lajoie, "C++ Primer", Pearson Education, Fourth Edition, 2004.
3. Kamthane,"Object Oriented Programming with ANSI and Turbo C++", Pearson Education, First Edition, 2002.
4. Bhave, "Object Oriented Programming With C++", Pearson Education, Second Edition, 2012.

	L	T	P	C

13CA203 **DESIGN AND ANALYSIS OF ALGORITHMS**

3 1 0 4

OBJECTIVE:

To provide the students with solid foundations in the learning of designing and analyzing of various algorithms.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To introduce basic concepts of algorithms
- To understand mathematical aspects in analyzing algorithms
- To understand different types of algorithms specifically available for sorting and searching, and how they can be applied.

UNIT I   INTRODUCTION   (12)

Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – Analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.

UNIT II   DIVIDE AND CONQUER METHOD AND GREEDY METHOD   (12)

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen's matrix multiplication – Greedy method – Prim's algorithm – Kruskal's algorithm -Dijkstra's algorithm.

UNIT III DYNAMIC PROGRAMMING   (12)

Computing a binomial coefficient – Warshall's and Floyd's algorithm – Optimal binary search tree – Knapsack problem- Memory functions.

UNIT IV   BACKTRACKING AND BRANCH AND BOUND   (12)

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Travelling salesman problem.

UNIT V   NP-HARD AND NP-COMPLETE PROBLEMS   (12)

P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Travelling salesman problem – Knapsack problem.

TOTAL = 60

REFERENCES:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Education, Second Edition, 2005.
2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms", Prentice Hall, Second Edition, 2001.

13CA204   **SYSTEM SOFTWARE**

L	T	P	C
3	0	0	3

OBJECTIVE:

To provide the knowledge about working of assembler, loader, linker, macro processor and system software tools.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors and compilers.
- To have an understanding of system software tools.

UNIT I   INTRODUCTION   (9)

Introduction – System software and machine architecture – The Simplified Instructional Computer (SIC) – Machine Architectures (SIC and SIC/XE) – Data and Instruction Formats – Addressing Modes – Instruction sets – I/O Programming.

UNIT II   ASSEMBLERS   (9)

Basic assembler functions – A simple SIC assembler – Assembler algorithms and data structures – Machine dependent assembler features, Instruction formats and addressing modes – Program relocation – Machine independent assembler features – Literals – Symbol-defining statements – Expressions – Program Blocks – Control Sections and Program Linking – One Pass Assembler and Multipass Assemblers – Implementation examples – MASM assembler.

UNIT III LOADERS AND LINKERS   (9)

Basic loader functions: Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader, features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader. Machine-independent loader features – Automatic Library Search – Loader Options - Loader design options – Linkage Editors – Dynamic Linking – Bootstrap Loaders. Implementation examples: MSDOS linker.

UNIT IV MACRO PROCESSORS   (9)

Basic macro processor functions – Macro Definition and Expansion – Macro Processor Algorithm and

data structures – Machine – independent macro processor features – Concatenation of Macro Parameters

– Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters – Macro

Processor Design Options - Recursive Macro Expansion – Algorithm – General Purpose macro

Processors – Macro Processing within Language Translators - Implementation examples: MASM Macro

Processor – ANSI C macro language.

UNIT V   OTHER SYSTEM SOFTWARE **(9)**

Text editors – Overview of Editing Process - User Interface – Editor Structure – Interactive Debugging Systems – Debugging functions and capabilities – Relationships with Other parts of the system – User Interface Criteria.

TOTAL = 45

TEXT BOOK:

1. Leland Beck, "System Software – An Introduction to Systems Programming", Pearson Education, Inc., Third Edition, 2011.

REFERENCES:

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Tata McGraw Hill Company, Second Edition, 2009.
2. John J. Donovan, "Systems Programming", Tata McGraw Hill Company, 1991.

	L	T	P	C
13CA205　　　　　　　　**OPERATING SYSTEMS**　　　　　　　　　　　3　　0　　0　　3

OBJECTIVE:

      To provide an overview of an Operating System and its concepts such as memory management, processor management, I/O management, File management and Security protection.

LEARNING OUTCOMES:

At the end of the course the students would

- become familiar with the fundamental concepts of operating systems;
- become competent in recognizing operating systems features and issues
- have sufficient understanding of operating system design and how it impacts application systems design and performance.
- To become familiar with the inner workings of mainstream operating systems like DOS, Windows and Linux
- To get an in-depth knowledge of three major OS subsystems: process management, memory management, file systems, and operating system support.

UNIT I　　　　　INTRODUCTION　　　　　　　　　　　　　　　　　　　(9)
Introduction – Operating Systems and services – Processes – CPU Scheduling approaches.

UNIT II　　　　PROCESS SYNCHRONIZATION　　　　　　　　　　　　(9)
Process synchronization – Semaphores – Deadlocks – Handling deadlocks – Multithreading.

UNIT III　　　MEMORY MANAGEMENT　　　　　　　　　　　　　　　(9)
Memory management – Paging – Segmentation – Virtual Memory – Demand paging – Replacement Algorithms.

UNIT IV　　　DISK SCHEDULING　　　　　　　　　　　　　　　　　(9)
Disk Scheduling approaches – File systems – Design issues – User interfaces to file systems – I/O device management.

UNIT V　　　　CASE STUDIES　　　　　　　　　　　　　　　　　　　(9)
Case study –Design and implementation of the UNIX OS, Process model and structure – Memory management - File system – UNIX I/O management and device drivers – Windows – System components – Process Management - Memory management – File Systems – Networking.

TOTAL = 45

REFERENCES:

1.　　Abraham Silberschatz Peter B. Galvin, G. Gagne, "Operating System Concepts", Addison Wesley Publishing Co., Eighth Edition, 2010.
2.　　M. J. Bach, "Design Of The Unix Operating System", Pearson Education, Fifth Edition, 1990.
3.　　Willam Stalling, "Operating System", Pearson Education, Fifth Edition, 2005.

Approved in the Second Governing Body

13CA211   OBJECT ORIENTED PROGRAMMING LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVE:

To develop programs by applying the concept of constructors, Destructors, Function overloading, operator overloading, inheritance and exception handling mechanisms.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To develop programs for implementing the various features of OOP such as Constructors, inheritance, polymorphism, Exceptional handling, Templates using programming language C++.

1.   C++ Program to illustrate Enumeration and Function Overloading

2.   C++ Program to illustrate Scope and Storage class

3.   Implementation of ADT such as Stack and Queues

4.   C++ Program to illustrate the use of Constructors and Destructors and Constructor

        Overloading

5.   Program to illustrate Static member and methods

6.   Program to illustrate Bit fields

7.   Program to overload as binary operator, friend and member function

8.   Program to overload unary operator in Postfix and Prefix form as member and friend

        function

9.   Program to illustrate Iterators and Containers

10.   C++ Program to illustrate function templates

11.   C++ Program to illustrate template class

12.   C++ Programs and incorporating various forms of Inheritance

13.   C++ Program to illustrate Virtual functions

14.   Exception Handling

		L	**T**	**P**	**C**
13CA212	**SYSTEM SOFTWARE LABORATORY**	**0**	**0**	**3**	**2**

OBJECTIVE:

To implement assemblers, Linkers, Loaders, Text editors and Unix concepts such as Message queues, Pipe, FIFO's, Signals, Shared memory

LEARNING OUTCOMES:

At the end of the course the students would be able

- To develop programs for Assemblers, Linkers and Editors.
- To implement the various features in Unix and Shell programming like Message Queues, Pipe, FIFO , Signals and Shared memory.

Write a program to implement the following using shell programming and C programming languages.

1. Assemblers.

2. Linkers.

3. Loaders.

4. Features of text editors

5. Basic UNIX commands.

6. Shell Programming.

7. Grep, sed, awk.

8. File system related system calls.

9. Process management – Fork, Exec.

10. Message queues.

11. Pipe, FIFO's.

12. Signals.

13. Shared memory.

	L	**T**	**P**	**C**
13CA213 **ALGORITHMS LABORATORY**	**0**	**0**	**3**	**2**

OBJECTIVE:

To solve different problems using Divide and Conquer method, Greedy method, Dynamic Programming, Backtracking method, Branch and Bound Technique and to implement different Searching and Sorting Techniques.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To develop programs for Sorting and Searching Techniques.
- To write programs for different algorithms such as Divide and conquer, Dynamic programming, Branch and Bound and Backtracking.

Write a program for the following concepts in C++ language.

1. Quick Sort

2. Binary Search

3. Binary Tree Traversal

4. Warshall's Algorithm

5. Dijkstra's Algorithm

6. Prim's Algorithm

7. Knapsack Problem – Dynamic Programming

8. Subset Sum Problem – Backtracking

9. Travelling salesperson problem – Branch and Bound

10. Strassen's matrix multiplication

13CA301   **COMPUTER NETWORKS**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand networking concepts and basic communication model.
- To understand network architectures and components required for data communication.
- To analyze the function and design strategy of physical, data link, network layer and transport layer
- To Acquire knowledge of various application protocol standard developed for internet

LEARNING OUTCOMES:

At the end of the course the students would be

- Able to Identify the components required to build different types of networks
- Able to understand the functionalities needed for data communication into layers

UNIT I   INTRODUCTION   (9)
Data Communications – Networks – Protocols and Standards. Network Models – OSI Model – Layers – TCP/IP Protocol Suite – Addressing. Digital Transmission – Digital-to-Digital Conversion – Analog-to-Digital Conversion – Transmission Modes. Analog Transmission – Digital-to-Analog Conversion – Analog-to-analog Conversion. Transmission Media – Guided and Unguided Media.

UNIT II   DATA LINK LAYER   (9)
Error – detection and correction – Parity – LRC – CRC – Hamming code – Flow Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 – IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III   NETWORK LAYER   (9)
Internetworks – Circuit Switching - Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – BGP -Routers.

UNIT IV   TRANSPORT LAYER   (9)
Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V   APPLICATIONS   (9)
Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TOTAL = 45

TEXT BOOK:
1. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.

REFERENCES:

1. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
2. Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.
3. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.

	L	**T**	**P**	**C**
13CA302 **DATABASE MANAGEMENT SYSTEMS**	**3**	**0**	**0**	**3**

OBJECTIVES:

- To understand the fundamentals of data models and conceptualize and depict a database system using ER diagram
- To make a study of SQL and relational database design.
- To impart knowledge in transaction processing and database security.

LEARNING OUTCOMES:

At the end of the course the students would be

- Design a database using ER diagrams and map ER into Relations and normalize the relations
- Acquire the knowledge of query evaluation to monitor the performance of the DBMS.
- Develop a simple database applications using normalization.

UNIT I   INTRODUCTION   (6)

Database and database users, Database systems – concepts and architecture, Data modeling using entity relationship model.

UNIT II   DATA MODEL, ALGEBRA & ER DIAGRAM   (9)

Relational data model and relational database constraints, Relational algebra, Relational database design using ER- and EER-to-relational mapping.

UNIT III   BACK END PROGRAMMING   (9)

SQL and PL/SQL.

UNIT IV   RELATIONAL DATABASE DESIGN   (9)

Relational database design – Informal guidelines for relational schemas, functional dependencies, normal forms based on primary keys, general definitions of second and third normal form, Boyce-Codd normal form.

UNIT V   ADDITIONAL TOPICS   (12)

Algorithms for query processing and optimization, Transaction processing concepts, Database security and authorization. XML databases.

TOTAL = 45

TEXT BOOK:

1. R. Elmasri, S.V. Navathe. "Fundamentals of Database Systems", Fifth Edition.

REFERENCES :

1. Henry F. Korth, Abraham Silberschatz, S. Sudarshan." Database System Concepts", McGraw Hill International Publications, 2002.
2. Raghu Ramakrishnan. "Database Management Systems", Third Edition.
3. C. J. Date. "An Introduction to Database Systems", Seventh Edition.

	L	**T**	**P**	**C**
13CA303 **SOFTWARE ENGINEERING**	**3**	**0**	**0**	**3**

OBJECTIVES:

To help students to develop skills that will enable them to construct software of high quality which is reliable and make them practitioners skilled in applying engineering process and practice to software components and Improvement in design languages, reusable code and for participatory design and Interactive debugging.

LEARNING OUTCOMES:

At the end of the course the students would know

- Various quality assurance techniques, including testing, and automated analysis tools.
- Creating a project plan and analyzing design models & Use of CASE tools

UNIT I   INTRODUCTION   **(9)**

Introduction to software Engineering – Software Project management – Software Process – Process Models – Software Project Planning – Project Scheduling.

                                                     (9)
UNIT II   ANALYSIS
Risk Management – Software Estimation - Analysis Model – Design Engineering: Design Concepts - Design Model.

UNIT III   DESIGN   **(9)**

Architectural Design: Software Architecture – Data Design – Architectural Styles – Architectural Design – Mapping DFD into Software Architecture –Component Level Design – User Interface Design.

UNIT IV   TESTING   **(9)**

Testing Strategies – Testing Tactics: Black box testing – White box Testing – Object Oriented Testing – Product Metrics

UNIT V   PROCESS MANAGEMENT   **(9)**
Software Metrics for Process and Project - Software Configuration Management – Software Quality Management.

                                                TOTAL = 45

TEXT BOOK:

1. Roger S. Pressman, "Software Engineering: A Practitioner Approach", McGraw-Hill, Sixth edition, 2010.

REFERENCES:

1. I. Sommerville, "Software Engineering", Addison Wesley Longman, Sixth Edition, 2004.
2. Kassem A.Salleh, "Software Engineering", First Edition, J.Ross Publishing, 2009.
3. Pankaj Jalote, "An Integrated approach to Software Engineering", Springer Verlag, Third Edition, 2005.
4. Jibitesh Mishra, Ashok Mohanty, "Software Engineering" Pearson Education, First Edition, 2012.
5. Roger S.Pressman , David Lowe, "Web Engineering: A Practitioner's Approach", Special Indian Edition, McGraw Hill, 2008.

	L	T	P	C

13CA304   **JAVA PROGRAMMING**

	L	T	P	C
	3	0	0	3

OBJECTIVES:

- To provide Object Oriented Programming knowledge through JAVA.
- To introduce the advanced concepts in JAVA, networking and database connectivity.

LEARNING OUTCOMES:

At the end of the course the students would be

- Able to understand Object Oriented Programming knowledge through JAVA.
- Able to understand networking concepts through TCP/IP, UDP and database connectivity through advanced concepts like RMI, Servlets.

UNIT I   INTRODUCTION   (12)

Overview of Java - Program Structure – Java fundamentals – Expressions and Operators – Control Structures – Arrays – Strings - Classes, Objects and Methods.

UNIT II   INTERFACE AND PACKAGES   (12)

Inheritance – Polymorphism - Interfaces – Packages – Multithread – Exception handling – File handling.

UNIT III   SWING   (12)

Introduction to JFC – JFC Components – Buttons, Checkbox, Radio Button, Textfield, Menu and toolbars, ComboBox and List - Advanced JFC Components – OptionPane, Choice Dialog, Dialog and Progress Monitor – Layout manager and events.

UNIT IV   JDBC AND NETWORK PROGRAMMING   (12)

Network Concepts – Socket, Domain Naming Service, Inet Address, Port - TCP/IP – Datagram – URL – Java Database Connectivity.

UNIT V   ADVANCED JAVA   (12)

Java Beans – RMI – Implementation of RMI Packages – RMI Architecture - Servlet – JSP – JNI.

TOTAL = 60

TEXT BOOKS:

1. Schildt, Herbert, "The Complete Reference – Java 2 ", Fifth Edition, Tata McGraw-Hill, New York, 2002.
2. Elliotte Rusty Harold, "Java Network Programming ", Second Edition, O'Reilly, 2004.

REFERENCES:

1. Keyur Shah, "Java 2 Programming ", Tata McGraw-Hill publication, 2002.
2. Naughton, "The Complete Reference –Java 2", Third Edition, Tata McGraw-Hill publication, 1999.

13CA305   **OBJECT ORIENTED ANALYSIS AND DESIGN**

L	T	P	C
3	0	0	3

OBJECTIVE:

The course aims to introduce the concepts of object –oriented development process, UML and related methodologies.

LEARNING OUTCOMES:

At the end of the course the students would be able

- To know how to identify objects, relationships, services and attributes through UML.
- To understand the use-case diagrams.

UNIT I   INTRODUCTION   (9)

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships – Associations – Aggregations- Identity – Dynamic binding – Persistence – Meta classes – Object oriented system development life cycle.

UNIT II   METHODOLOGY AND UML   (9)

Introduction – Survey – Rumbugh, Booch, Jacobson methods – Patterns – Frameworks – Unified approach – Unified modelling language – Static and Dynamic models – UML diagrams – Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility.

UNIT III   OBJECT ORIENTED ANALYSIS   (9)

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility.

UNIT IV   OBJECT ORIENTED DESIGN   (9)

Design process – Axioms – Colollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface- OOUI- MVC Architectural Pattern and Design- Designing the system.

UNIT V   QUALITY AND TESTING   (9)

Quality assurance – Testing strategies – Test cases – Automated Testing Tools-Case Study – Cryptanalysis – Health Care Systems – Inventory Control System – Rational Rose Suite.

TOTAL = 45

TEXT BOOK:

1. Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 2008.

REFERENCES:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley Long man, Second Edition, 2004.
2. Craig Larman, "Applying UML and Patterns", Pearson, Third Edition 2005.
3. Brahma Dathan, Sarnath Ramnath, "Object Oriented Analysis, Design and Implementation", Univesities Press, 2010.
4. Bernd Bruegge, Allen H. Dutoit, "Object Oriented Software Engineering using UML", Patterns and Java, Pearson, 2004.
5. Martin Fowler, "UML Distilled A Brief Guide to Standard Object Modeling Language", Third Edition, Addison Wesley, 2003.

L	T	P	C
0	0	3	2

13CA311   DATABASE MANAGEMENT SYSTEM LABORATORY

OBJECTIVES:

- To make a study of SQL and relational database design.
- To know about data storage techniques a query processing.

LEARNING OUTCOMES:

At the end of the course the students would be

- Able to understand SQL statements.
- Able to understand stored procedures and functions.
- Develop a simple database applications using normalization.

PART –I:

1. Create Tables

2. Add/Remove/modify Constraints or columns

3. Perform SQL Functions

4. Perform Simple Queries

5. Perform Complex Queries

6. Write PL/SQL blocks

7. Write Cursors

8. Write Functions

9. Write Procedures

10. Write Triggers

PART –II:

1. Design an ER diagram for a proposed System

2. Create Relational Schema for the proposed System

3. Develop the Back End using all the concepts in PART-I

4. Develop a small front end for retrieval, insert, update and delete in VB/VC++/Java from the created

    back end.

	L	**T**	**P**	**C**
13CA312 **JAVA PROGRAMMING LABORATORY**	**0**	**0**	**3**	**2**

OBJECTIVE:

To develop programs by applying the concept of object oriented programming concepts.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To develop programs for implementing the various features of OOP such as class, objects, inheritance, polymorphism, Exceptional handling, packages using programming language Java.
- To develop programs in JDBC, RMI, Servlets, JSP and Bean.

1. Classes, Objects and Methods
2. Inheritance
3. Polymorphism
4. Interfaces
5. Package
6. Creation of a simple program to connect through JDBC.
7. Create a Java Bean.
8. Create a Client/Server application using RMI.
9. Develop an application to connect a Servlet program with database.
10. Create an application to implement JSP.

	L	T	P	C
	0	0	3	2

13CA313   **CASE TOOLS LABORATORY**

OBJECTIVE:

To develop knowledge by applying the concept of different modelling in CASE environment such as case tools.

LEARNING OUTCOMES:

At the end of the laboratory the students would be able

- To understand the case tools Rational Rose.
- To understand how to model a business plan, analyse, design, program, verify, validate and maintain project.

1. Practicing the different types of case tools such as (Rational Rose & other Open Source) used for all the phases of Software development life cycle.

2. Data modeling

3. Semantic data modeling

4. Source code generators

5. Re-engineering

6. Experimenting CASE Environments

    Toolkits

    Language-centered

    Integrated

    Fourth generation

    Process-centered

7. Implementation of the following using CASE Workbenches:

    Business planning and modeling

    Analysis and design

    User-interface development

    Programming

    Verification and validation

    Maintenance and reverse engineering

    Configuration management

    Project management

13PT312   **Language Competency Development**

L	T	P	C
0	0	2	0

OBJECTIVES :

- To make students speak English fluently with emphasis on:
  - Articulation,
  - Vocabulary,
  - Content.
- To develop the habit of self research for learning among students.
- To develop behavioral skills among students across all levels.
- To develop reading habits.
- To develop persuasion and negotiation skills.

LEARNING OUTCOMES:

Learners would be able to

- Articulate fluently in English on the day to day affairs.
- Know the areas from where they can research and learn English.
- Exhibit professionalism.
- Exhibit expertise on world affairs.
- Exhibit persuasion skills.

UNIT I –Auxiliaries   **(7)**

am, is, are (statement and questions) - I am doing - are you doing? - I do/work/like - I don't - Do you - I am doing and I do - I have / I've got

UNIT II –Tense   **(10)**

Was/were - worked/got/went - I didn't…dit you…? - I was doing - I was doing and I did - I have done I've just…I've already…I haven't…yet - Have you ever…? - How long have you…? - for since ago - I have done and I did - is done was done - is being done has been done - be/have/do

UNIT III –Modals   **(7)**

Regular and irregular verbs - I used to… - What are you doing tomorrow? - I'm going to… - will/shall - will/shall - might - can and could - must - should

UNIT IV –Questions Patterns & Tags   **(10)**

I have to… - Would you like …? I'd like… - there is there are - there was/were there has/have been here will be - It… - I am I don't etc - Have you? Are you? Don't you? Etc. - too/either so am I / neither do I etc. - isn't haven't don't etc. - Is it? Have you…? Do they…? Etc. - Who saw you? Who did you see? - Who is she talking do? What is it like? - What…? Which…? How…? - How long does it take…? - Do you know where…? I don't know what…etc.

UNIT V – Reported Speech - Said, Told, Want Series   **(10)**

She said that… He told me that… - Work/working go/going do/doing - to…(I want to do) and ing (I enjoy doing) - I want you to… I told you to… - I went to the shop to… go to… go on… go for… going - get - do and make – have.

UNIT VI –Self Descriptions   **(4)**

I/me he/him they/them etc. - My/his/their etc. - Whose is this? It's mine/yours/hers etc. - I/me/my/mine.

TOTAL = 48

TEXT BOOK:

1. "English Spoken Course materials", from the Speak Easy academy.

REFERENCE BOOKS:

2. "High School English Grammar & Composition", Revised Edition 1st Edition by Wren & Martin.
3. "UPKAR's Correct English – How to Write it", by Dr. B. B. Jain.

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	News Presentation	15	Articulation (a)	Average (a+b+c+d+e)
2	Debate	20	Word Usage (b)	
3	Class Participation	15	Content (c) Listening (d) Body Language (e)	
Internal Total		50		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	Assessment Centre	20	**Role delivery (a)** **Articulation & Word Usage (b)** **Content Validity (c)** **Participation in team (d)**	**Average (a+b+c+ d)**
2	Written Test	30	Objective type	
Final Total		**50**		

Notes:

- News presentation and debate shall happen in every class. So the final marks will be the average of all the attempts.
  - News presentation and debate will be unconventional where in it will be within the team and not for the whole class at once.
  - On a given hour a faculty can assess two teams so considering that there will 72 students there will 6 teams of 12 each and hence every students would have done presentation and debate at least twice per semester for assessment alone.
- Class participation is based on the student's regularity in doing home work.
- Assessment Centre is one where a case shall be given and the students shall be given roles to perform. Language skills, Behavioural skills, General Awareness, Persuasion Skills shall be measured during this exercise.

		L	**T**	**P**	**C**

3   0   0   3

13CA401   **NETWORK PROGRAMMING**

OBJECTIVES:

   The course aims to make understand about networking in the environment of Unix OS and help to
program using TCP, UDP and raw sockets

LEARNING OUTCOMES:

At the end of the course the students would

- Be able to understand Unix OS environment.
- Be able to understand signals, threads, semaphore and mutex in Unix OS.
- Be able to understand and program client/server concepts using TCP, UDP and raw sockets.

UNIT I   INTRODUCTION   (9)

Introduction – Overview of UNIX OS - Environment of a UNIX process - Process control - Process
relationships Signals – Interprocess Communication- overview of TCP/IP protocols.

UNIT II   ELEMENTARY TCP SOCKETS   (9)

Introduction to Socket Programming –Introduction to Sockets – Socket address Structures – Byte ordering
functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept,
read, write , close functions – Iterative Server – Concurrent Server.

UNIT III   APPLICATION DEVELOPMENT   (9)

TCP Echo Server – TCP Echo Client – Posix Signal handling – Server with multiple clients – boundary
conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown –
I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with
multiplexing) – poll function – TCP echo Client (with Multiplexing)

UNIT IV   SOCKET OPTIONS, ELEMENTARY UDP SOCKETS   (9)

Socket options – getsocket and setsocket functions – generic socket options – IP socket options – ICMP
socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client –
Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – Ipv6 support in
DNS – gethostbyadr function – getservbyname and getservbyport functions.

UNIT V   ADVANCED SOCKETS   (9)

Ipv4 and Ipv6 interoperability – threaded servers – thread creation and termination – TCP echo server
using threads – Mutexes – condition variables – raw sockets – raw socket creation – raw socket output –
raw socket input – ping program – trace route program.

TOTAL = 45
Approved in the Second Governing Body

TEXT BOOKS:

1. W. Richard Stevens, "Advanced Programming in The UNIX Environment", Addison Wesley, Second Edition 2009.
2. W. Richard Stevens, "UNIX Network Programming - Volume 1", Prentice Hall International, Second Edition 1998.

REFERENCE:

1. Meeta Gandhi,Tilak Shetty and Rajiv Shah , " The 'C' Odyssey Unix –The open Boundless C", First Edition, BPB Publications, 1992.

13CA402   **RESOURCE MANAGEMENT TECHNIQUES**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide the concept and an understanding of basic concepts in Operations Research.
- Techniques for Analysis and Modeling in Computer Applications.
- To understand , develop and solve mathematical model of linear programming problems.
- To understand , develop and solve mathematical model of Transport and assignment problems.
- To understand network modeling for planning and scheduling the project activities.

LEARNING OUTCOMES:

- Understand and apply linear, integer programming to solve operational problem with constraints.
- Apply transportation and assignment models to find optimal solution in warehousing and Travelling.
- To prepare project scheduling using PERT and CPM.
- Identify and analyze appropriate queuing model to reduce the waiting time in queue.
- Able to use optimization concepts in real world problems.

UNIT I   LINEAR PROGRAMMING MODELS   (9)
Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method

UNIT II   TRANSPORTATION AND ASSIGNMENT MODELS   (9)
Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution – optimum solution - degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm – Variants of the Assignment problem

UNIT III   INTEGER PROGRAMMING MODELS   (9)
Formulation – Gomory's IPP method – Gomory's mixed integer method – Branch and bound technique.

UNIT IV   SCHEDULING BY PERT AND CPM   (9)
Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling.

UNIT V   QUEUEING MODELS   (9)
Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO / ∞ /∞), (M / M / 1) : (FIFO / N / ∞), (M / M / C) : (FIFO / ∞ / ∞), (M / M / C) : (FIFO / N / ∞) models.

TOTAL = 45

REFERENCES:

1. Taha H.A, "Operations Research: An Introduction ", 8th Edition, Pearson Education, 2008.
2. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, "Operations Research", Pearson Education, Asia, 2005.
3. Prem Kumar Gupta, D.S. Hira, "Operations Research", S.Chand & Company Ltd, New Delhi, Third Edition , 2008.
4. John W. Chinneck, "Feasibility and Infeasibility in Optimization Algorithms and Computational Methods", Springer, 2008.
5. Ravindran, Phillips, Solberg,"Operations Research: Principles And Practice", Second Edition, John Wiley & Sons, 01-Jul-2007.
6. Ibe, O.C, "Fundamentals of Applied Probability and Random Processes", Elsevier, U.P., First Indian Reprint, 2007.
7. Gross, D. and Harris, C.M., "Fundamentals of Queuing Theory", Wiley Student, 3rd Edition, New Jersy, 2004.

13CA403   **.NET FRAMEWORK**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide Web based programming knowledge using .NET Framework.
- To introduce the concepts of VB.NET data access and Web services.

LEARNING OUTCOMES:

- Able to understand .Net Framework and VB.Net.
- Able to develop an application using ASP.NET .
- Able to understand the concept of web services.

UNIT I   INTRODUCTION TO .NET FRAMEWORK   **(12)**

Characterize the .NET Paradigm – Web Services – .NET Framework – Common Language Runtime (CLR) – Re-use Code - Multiple Language Support in .NET – Cross-Language Interoperability – Garbage Collection - Structured Error-Handling – Namespaces - .NET Class Framework Vs Language-Specific Class Library - .NET Windows Forms - Console Applications.

UNIT II BASICS OF VB.NET   **(12)**

Object Oriented Programming and VB.NET – Creating Windows Forms Applications – Data Types – Variables – Operators – Arrays – Conditional Logic – Procedures – Dialog Boxes – File IO and System Objects – Dictionary Objects – Error Handling – Namespaces – Classes and Objects – Multithreading.

UNIT III IDE FOR VB.NET AND DATA ACCESS   **(12)**

Visual Basic .NET IDE – Compiling and Debugging – Customizing – Source Control – Data Access in .NET – ADO.NET – Data Access in Visual Studio .NET – XML in .NET – Introduction to Forms – Controls – Specific Controls – Visual Inheritance – Irregular Forms.

UNIT IV ASP.NET AND THE WEB   **(12)**

Introduction to Web Development – Introduction to ASP.NET – Page Framework – HTML Server Controls – Web Controls – Validation Controls – User Controls –   Events – Cascading Style Sheets – State Management – ASP.NET Applications – Tracing.

UNIT V   WEB SERVICES   **(12)**

Introduction to Web Services – Web Services Infrastructure – SOAP – Building Web Service – Deploying and Publishing Web Services – Web Services Discovery – Consuming Web Services – Globalization.

TOTAL = 60

TEXT BOOKS:

1. Bill Evjen, Jason Beres, et al., *"Visual Basic .NET Programming", Wiley, New Delhi, 2007.*
2. Matthew MacDonald, "ASP .NET: The Complete Reference"*, Tata McGraw Hill, New Delhi, 2007.

REFERENCES:

1. Jeffrey R. Shapiro, "Visual Basic .NET: The Complete Reference"*, Tata McGraw Hill New Delhi, 2002.
2. Steven Holzner, "Visual Basic .NET Programming – Black Book"*, Dream Tech Press, New Delhi, 2008.

			L	**T**	**P**	**C**

13CA404   **OPEN SOURCE SYSTEMS**

L   T   P   C
3   0   0   3

OBJECTIVES:

- Provide the knowledge of PHP and Perl. It helps to do web based programming.
- It allows the students to learn about cookies

LEARNING OUTCOME:

- The students shall be able to do the programming using PHP and Perl and python.

UNIT I   INTRODUCTION TO OPEN SOURCE PROGRAMMING AND PHP   (14)

Introduction to Open Source Programming, OSD, PHP, Apache, MySQL– Overview of PHP – Variables, Operations, Constants, Control Structures Arrays, Functions, Classes – Handling Files.

UNIT II   DATABASE PROGRAMMING   (6)

My SQL database programming – Connecting – Table creation – Record Insertion – Updating – Multiple database handling

UNIT III   MAILS AND COOKIES   (6)

E-mailing with PHP – Sending an email – Multipart Message – Storing images – Getting confirmation. Session tracking using PHP – Graphics Input Validators – Cookies

UNIT IV   PHP FRAMEWORK   (6)

Introduction to Symfony, CakePHP, AND ZEND Framework - First applications on three frameworks - Working with databases

UNIT V   PERL   (13)

Introduction to Perl – Numbers and strings – Control statements – Lists and arrays – Introduction to TCl/Tk-Introduction to Python.

TOTAL = 45

TEXT BOOKS:

1. Ashish Wilfred Metta Gupta and Karticj Bhatnagar "PHP Professional Projects," – Prentice Hall and India Pvt. Ltd., New Delhi, 2002.
2. Bartosz Porebski, Karol Przystalski and Leszek Nowak, "Building PHP Applications symphony, CakePHP, and Zend Framework", Worx publications.
3. Sevev suehring, Dim Conderse, and Joyce Park "PHP 6 and MySQL bible", Wiley- India Pvt ltd, New Delhi, 2009.

REFERENCES:

1. Beginning PHP, Apache, MYSQL Web Development Micheal K. Glass, Rommnle Scouarnec, Wiley Dream Tech publishing Inc. New Delhi 2004.
2. Core PHP Programming, Leon Atkinson and Zeev Suraski, Pearson Education, Delhi, 3rd edition, 2004.
3. Teach Yourself Perl, Clinton pierce, Techmedia, New Delhi, 2000.
4. Tom Christiansen and Nathan Torkington, Perl CookBook, Shroff Publications, 1999.

13CA411   **NETWORK PROGRAMMING LABORATORY**   **L   T   P   C**

                                                                                        0   0   3   2

OBJECTIVES:

- To provide practical knowledge to develop program to understand network concepts and sockets.
- To provide knowledge about RPC, Sliding Window, DNS, etc.

LEARNING OUTCOMES:

- Able to develop program TCP, UDP Sockets.
- Able to understand the Sliding Window Protocol, RPC, DNS, etc

1. Socket Programming

     TCP Sockets

     UDP Sockets

     Applications using Sockets

2. Simulation of Sliding Window Protocol

3. Simulation of Routing Protocols

4. RPC

5. Development of applications such as DNS/ HTTP/ E – mail/ Multi - user Chat

13CA412   **.NET FRAMEWORK LABORATORY**   **L   T   P   C**

                                                                                   0   0   3   2

OBJECTIVES:

- To provide Web based programming knowledge using VB.NET.
- To provide practical knowledge about ADO.NET.

LEARNING OUTCOMES:

- Able to know how to develop a web application in VB.NET.
- Able to know how to use ADO.NET in applications
- Able to gain good experience by doing mini project.

1. Create a simple application using VB.NET.

2. Design a Web application form to create a database that validates the entries using controls.

3. Design an application using ASP.NET.

4. Create a Web service for an application using VB.NET.

5. Create a package for any application using   ADO.NET.

6. Create any online application for implementing .Net framework.

		L	T	P	C
13CA413	**OPEN SOURCE SYSTEMS LABORATORY**	0	0	3	2

OBJECTIVES:

- To provide how to install different kind of installation.

- To provide knowledge about PHP with MySQL, Phyton and perl.

LEARNING OUTCOMES:

- Able to understand installation of various softwares.

- Able to have the knowledge about PHP, MySQL, Phython and Perl.

1. Installation in different modes (User mode, GUI, Single user, Server).
2. MySQL Installation.
3. Apache Installation.
4. PHP Program using statement and function.
5. PHP Program using regular expression and string manipulation.
6. PHP Program using arrays and objects.
7. Data base connectivity with MYSQL.
8. PHP with Database Connectivity.
9. PHYTON Programming.
10. Perl script and CGI.
11. Development of an application using PHP and MYSQL.

	L	**T**	**P**	**C**
13PT412 **Verbal, APPS, Reasoning Training**	**0**	**0**	**2**	**0**

OBJECTIVES :

- To develop students to workout solution for problems that involves mathematics aptitude.
- To develop students to workout solutions for problems that involving general reasoning.
- To develop students to become sharp in usage of English grammar.

LEARNING OUTCOMES:

Learners would be able to

- Solve aptitude problems with ease.
- Solve reasoning problems with ease.
- Improve written communication skills in English.

Unit I - Verbal (16)

Tense - Articles- Preposition - Subject Verb agreement- Sentences completion-Sentence Improvement-Incorrect sentences-Jumble sentence- Error spotting-Confusable words-Synonyms & Antonyms-Statement & Arguments-Reading comprehension-Theme detection.

UNIT II – Reasoning (16)

Odd man out - Number series-Diagrammatic question-Figure series-Venn Diagram -Syllogism-Coding &decoding-Seating arrangement, Height arrangement-Logical Puzzle-Cube problems-Analogy-Blood Relations-Directions-Data Interpretation-Data sufficiency-Statement & Assumption.

UNIT III –Aptitude (16)

Number system -Factorial-Matrix-Average-Percentage-Age-Ratio & Proportion-Partnership-Profit & loss-Mixture & Allegation-Simple and Compound Interest-Probability-Permutation and Combination-Speed & Distance-Train-Time & Work-Calendar-Clock-Volume & surface areas.

TOTAL = 48

TEXT BOOKS:

1. "Verbal Book", by Kaushal.B.Shah.
2. "Reasoning & Aptitude Book", by Vignesh.D.

REFERENCE BOOKS:

1. "Quantitative Aptitude", by Dinesh Khattar
2. "Objective English", by Hari Mohan Prasad   & Uma Rani Sinha.
3. "A Modern approach to verbal & non verbal reasoning", by R.S.Aggarwal.
   .

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions	
1	Written	50	Objective type	Average of Ten tests will be taken
Internal Total		**50**		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions
1	Written Test	50	Objective type
Final Total		**50**	

L   T   P   C

13CAX01   DATA MINING AND DATA WAREHOUSING   **3   0   0   3**

OBJECTIVES:

The subject is designed to meet the challenges of developing large data warehouses, as the industrial market is moving towards customer satisfaction and relationship intelligence will have to be embedded in business. The focus is mainly on the concepts of very large databases and their applications. The objective is to introduce the basic concepts of data warehouses, the design and tuning its performance. The concept of knowledge discovery in databases is also given importance. The students are given exposure to Knowledge Discovery process the architectures, the mining methodologies and the potential applications of data mining. We also develop data marts and extract patterns from it.

LEARNING OUTCOMES:

The students will be able to extract knowledge from hidden data in the database.

UNIT I   VERY LARGE DATABASES AND DATA WAREHOUSE   **(12)**

Introduction: VLDB – Data warehouse – Architecture of Data warehouse – Data warehouse and Business Strategy – Managing the Data – Data warehouse Development Life Cycle – Modeling.

UNIT II   METADATA REPOSITORY   **(6)**

Metadata and Metadata catalog – Performance issues and indexing – View Maintenance – Aggregates – Data warehouse on the Internet and security.

UNIT III   DATA MINING   **(6)**

Data Mining – Knowledge discovery in databases – Confluence of multiple disciplines – Taxonomy of data mining tasks – Integration of Data Mining and Data Warehousing – Concept Description..

UNIT IV DATA MINING TECHNIQUES   **(14)**

Data Mining Models – Statistics – Decision Trees – Neural Networks – Nearest Neighbor and Clustering – Genetic Algorithms – Rule Induction – Data Visualization – Selecting and using the right technique.

UNIT V OLTP & CASE STUDY   **(7)**

Online Transaction Processing, Applications of Data warehousing and Data Mining – A Case study.

TOTAL = 45

TEXT BOOKS:

1. Jiawei Han. "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers 2001.
2. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 1998.
3. W.H. Inmon, "Building the Data Warehouse", Wiley Dream tech & Sons Inc, 4th edition, 2005.

REFERENCES:

1. Usama M Fayyad, Gregory Piatetsky – Shapiro, Padhrai Smyth and Ramasamy Uthurusamy. "Advances in Knowledge Discovery and Data Mining", The M.I.T Press, 1996.
2. Sean Kelly "Data Warehousing in Action", John Wiley & Sons Inc 1997
3. Berry Micheal and Gordon Linoff, "Mastering Data Mining",John Wiley & Sons Inc, 2000

	L	T	P	C

13CAX02   **ELECTRONIC COMMERCE**   **3   0   0   3**

OBJECTIVE:

The course aim is to provide the knowledge about the Electronic commerce and its usage in Internet.

LEARNING OUTCOMES:

At the end of the course the students would

- Be able to understand the Electronic Commerce and Security Technologies.
- Be able to understand about Electronic payment methods, Providers and Electronic Business Applications.

UNIT I   INTRODUCTION   (6)

Networks and Commercial Transactions - Internet and Other Novelties – Electronic Transactions Today – Commercial Transactions –Establishing Trust - Internet Environment – Internet Advantage – World Wide Web

UNIT II   SECURITY TECHNOLOGIES   (9)

Why Internet Is Unsecure - Internet Security Holes - Cryptography: Objective – Codes and Ciphers – Breaking Encryption Schemes- Data Encryption Standard – Trusted Key Distribution and Verification – Cryptographic Applications –Encryption - Digital Signature – Nonrepudiation and Message Integrity.

UNIT III   ELECTRONIC PAYMENT METHODS   (9)

Traditional Transactions : Updating - Offline and Online Transactions - Secure Web Servers – Required Facilities – Digital Currencies and Payment Systems – Protocols for the Public Transport – Security Protocols – SET – Credit Card Business Basics.

UNIT IV   ELECTRONIC COMMERCE PROVIDERS   (9)

Online Commerce Options - Functions and Features - Payment Systems: Electronic, Digital and Virtual Internet Payment System - Account Setup and Costs - Virtual Transaction Process - InfoHaus - Security Considerations – CyberCash: Model - Security - Customer Protection - Client Application - Selling through CyberCash.

UNIT V   ONLINE COMMERCE ENVIRONMENTS   (12)

Servers and Commercial Environments - Payment Methods - Server Market Orientation – Netscape Commerce Server – Microsoft Internet Servers - Digital Currencies – DigiCash – Using   Ecash – Ecash Client   Software   and Implementation – Smart cards - The Chip - Electronic Data Interchange - Internet Strategies, Techniques and Tools.

TOTAL = 45

Approved in the Second Governing Body

TEXT BOOK:

1. Pete Loshin, "Electronic Commerce", , Firewall media, An imprint of Laxmi publications Pvt. Ltd., New Delhi, Fourth Edition, 2004.

REFERENCES:

1. Pete Loshin, "Electronic Commerce", , Firewall media, An imprint of Laxmi publications Pvt. Ltd., New Delhi, Fourth Edition, 2004.
2. Jeffrey F.Rayport and Bernard J. Jaworski, "Introduction to E-Commerce", Tata Mc-Graw Hill Pvt., Ltd., Second Edition, 2004.
3. Greenstein, "Electronic Commerce", Tata McGraw Hill Pvt., Ltd., 2000.

13CAX03 **MOBILE COMPUTING** **L   T   P   C**

                                                       3   0   0   3

OBJECTIVES:

- To learn the basic concepts, aware of the GSM, SMS, GPRS Architecture.
- To have an exposure about wireless protocols -WLN, Bluetooth, WAP, ZigBee issues.
- To Know the Network, Transport Functionalities of Mobile communication
- To understand the concepts of Adhoc and wireless sensor networks.
- To impart knowledge about Mobile Application Development

LEARNING OUTCOMES:

- Understand the architectures, the challenges and the Solutions of Wireless Communication those are in use.
- Able to develop simple Mobile Application Using Android.

UNIT I   INTRODUCTION TO WIRELESS NETWORKING.   **(6)**

Advantages and disadvantages of wireless networking Characteristics of radio propagation. Fading, Multipath Propagation

UNIT II INTRODUCTION TO DIGITAL TRANSMISSION.   **(8)**

Definition of bit-rate and signaling rate. Introduction to synchronous transmission. The need for pulse shaping, synchronization and line-coding. Calculation of bit-error probabilities.

UNIT III NARROWBAND & WIDEBAND TECHNIQUE   **(10)**

Narrowband digital modulation. The need for modulation. Binary and multi-level (M-ary) amplitude-shift keying (ASK), frequency-shift keying (FSK) and phase-shift keying (PSK). Wideband modulation techniques to cope with inter symbol interference Direct sequence spread spectrum Adaptive Equalization Orthogonal frequency division multiplex

UNIT IV MEDIUM ACCESS CONTROL (MAC)   **(13)**

MAC protocols for digital cellular systems such as GSM. MAC protocols for wireless LANs such as IEEE802.11 and HIPERLAN I and II. The near far effect. Hidden and exposed terminals. Collision Avoidance (RTS-CTS) protocols.

UNIT V PROTOCOLS SUPPORTING MOBILITY   **(8)**

Mobile network layer protocols such as mobile-IP, Dynamic Host Configuration Protocol (DHCP). Mobile transport layer protocols such as mobile-TCP, indirect-TCP. Wireless Application Protocol (WAP).

                                                                TOTAL = 45

TEXT BOOK

1. J.Schiller, "Mobile communications", ISBN: 0-321-12381-6, Addison-Wesley, 2003.

REFERENCES:

1. T.S. Rappaport, "Wireless communications; Principle and Practice", 1999.
2. A S. Tanenbaum, "Computer Networks", Fourth Edition, Prentice Hall PTR; August,2002.

13CAX04   **COMPUTER GRAPHICS AND MULTIMEDIA**

L	T	P	C
3	0	0	3

OBJECTIVE:

      The subject aims to cover Interactive and Non Interactive computer graphics methods, 2D and 3D modeling and develop device independent graphics packages.

LEARNING OUTCOMES:

At the end of the course the students would know

- It will help the students to learn how to design and develop optimal graphics algorithms with the optimal storage requirement. Starting with line and move primitive, the package is extended to characters and life style followed by polygon and polygon interior style.
- Able to learn the Multimedia trends and its applications.

UNIT I   **OUTPUT PRIMITIVES**   **(9)**

Introduction - Line - Curve and Ellipse Drawing Algorithms – Attributes – Two- Dimensional Geometric Transformations – Two-Dimensional Clipping and Viewing.

UNIT II   **THREE-DIMENSIONAL CONCEPTS**   **(9)**

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation.

UNIT III   **MULTIMEDIA SYSTEMS DESIGN**   **(9)**

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT IV   **MULTIMEDIA FILE HANDLING**   **(9)**
Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT V   **HYPERMEDIA**   **(9)**
Multimedia Authoring & User Interface – Hypermedia messaging – Mobile Messaging – Hypermedia message component – Creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

      TOTAL = 45

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI, 2003.

REFERENCES:

1. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.
2. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.

	L	T	P	C

13CAX05   **PRINCIPLES OF MANAGEMENT**   **L   T   P   C**

3   0   0   3

OBJECTIVE:
To expose the students to the basic concepts of management in order to aid in understanding how an organization functions, and in understanding the complexity and wide variety of issues managers face in today's business firms.

LEARNING OUTCOMES:

The students should be able to describe and discuss the elements of effective management,
- Discuss and apply the planning, organizing and control processes
- Describe various theories related to the development of leadership skills, motivation techniques, team work and effective communication,
- Communicate effectively through both oral and written presentation.

UNIT I   INTRODUCTION TO MANAGEMENT   (9)

Organization- Management- Role of managers- Evolution of management thought- Organization and the environmental factors- Managing globally- Strategies for International business.

UNIT II   PLANNING   (9)

Nature and purpose of planning- Planning process- Types of plans- OBJECTIVES :- Managing by Objective (MBO) strategies- Types of strategies – Policies – Decision Making- Types of decision- Decision making process- Rational decision making process- Decision making under different conditions.

UNIT III   ORGANISING   (9)

Nature and purpose of organizing- Organization structure- Formal and informal groups organization- Line and staff authority- Departmentation- Span of control- Centralization and decentralization- Delegation of authority-Staffing- Selection and Recruitment- Orientation- Career development- Career stages- Training- Performance appraisal

UNIT IV   DIRECTING   (9)

Managing people- Communication- Hurdles to effective communication- Organization culture- Elements and types of culture- Managing cultural diversity.

UNIT V   CONTROLLING   (9)

Process of controlling- Types of control- Budgetary and non-budgetary control techniques- Managing productivity- Cost control- Purchase control- Maintenance control-Quality control- Planning operations

TOTAL = 45

Approved in the Second Governing Body

TEXT BOOKS:

1. Andrew J. Dubrin, "Essentials of Management", Thomson Southwestern, 9th Edition, 2012.
2. Samuel C. Certo and Tervis Certo, "Modern management: concepts and skills", Pearson education, 12th Edition, 2012.
3. Harold Koontz and Heinz Weihrich, "Essentials of management: An International & Leadership Perspective", 9th Edition Tata McGraw-Hill Education, 2012.
4. Charles W .L Hill and Steven L McShane, "Principles of Management" , McGraw Hill Education, Special Indian Edition, 2007.

		L	T	P	C
13CA501	**SOFTWARE TESTING**	3	0	0	3

OBJECTIVES:

- To understand the fundamentals of software testing.

- To provide a complete, comprehensive coverage of various software testing methods.

- To develop test cases using manual testing and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

On completion of this course the student able

CO1. To apply the Software Testing Concepts.

CO2. To understand the working of manual testing.

CO3. To design the test cases and to get familiarity over testing tools.

CO4. To use the techniques, skills and modern software testing tools necessary for testing.

UNIT I INTRODUCTION (9)

Purpose of testing - Some Dichotomies – A model for testing-The taxonomy of bugs: Synopsis – Consequence of bugs – taxonomy of bugs – Level of Testing – Test Cases - Examples.

UNIT II FUNCTIONAL AND STRUCTURAL TESTING (9)

Boundary Value Testing – Equivalence Class Testing – Comparison Testing - Cause Effect Graphs - Basis Path Testing - Condition Testing - Data Flow Testing – Loop Testing - Structural Coverage.

UNIT III TESTING TYPES AND DOCUMENTS PREPARATION (9)

Unit Testing- Integration Testing – System Testing – Interaction Testing – Verification and Validation – Use case-Test Case-Bug Report Preparation.

UNIT IV FUNCTIONALITY TOOL (9)

Introduction to Win Runner - Creating a test script - Running a recorded test script - Verifying the Application - Analyzing test results - GUI Map - Data-Driving an Automated Test - Running tests in Batch mode - Test Script Language (TSL).

UNIT V OPEN SOURCE TOOL (9)

Introduction to Selenium - How to use Selenium – Test Automation for Web Application-IDE-Building Test Cases-Running Test cases-Script Language-Debugging-Trouble Shooting.

TOTAL: 45

TEXT BOOKS:

1. Paul C. Jorgensen, "Software Testing, A Craftsman's Approach", CRC Press, Second Edition (2007).

2. Renu Rajani, Pradeep Oak, "Software Testing Effective methods, Tools and Techniques", Tata McGraw- Hill, 2005.

REFERENCES:

1. J.Myers ,"The Art of Software Testing", 2nd edition. Published by John Wiley & Sons Inc., NJ, USA.

2. Boris Beizer ,"Software Testing Techniques", DreamTech Press.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and Pos												
COs	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x				x	x
2	x	x	x		x				x		x	
3		x	x	x	x	x	x			x	x	x
4				x	x	x	x	x		x	x	x

13CA502   **SOFTWARE PROJECT MANAGEMENT**   **L   T   P   C**

OBJECTIVES: **3   0   0   3**

- To know of how to do project planning for the software process.
- To learn the cost estimation techniques during the analysis of the project.
- To understand the quality concepts for ensuring the functionality of the software.

COURSE OUTCOMES:

On completion of this course the student able to

    CO1. Understand the activities during the project scheduling of any software application.

    CO2. Apply the risk management activities and the resource allocation for the projects.

    CO3. Can apply software estimation and recent quality standards for evaluating software projects.

    CO4. Acquire knowledge to create reliable, replicable cost estimation that links to the requirement of project planning and managing.

UNIT I SOFTWARE PROJECT MANAGEMENT CONCEPTS   (9)

Introduction to software project management - An Overview of Project Planning: Select Project - Identifying Project Scope and objectives - Infrastructure - Project Products and Characteristics - Estimate Efforts - Identify Activity Risks and Allocate Resources.

UNIT II SOFTWARE EVALUATION AND COSTING   (9)

Project Evaluation: Strategic Assessment - Technical Assessment - Cost-benefit analysis - Cash Flow Forecasting - Cost-Benefit Evaluation Techniques - Risk Evaluation. Selection of an Appropriate Project Approach: Choosing Technologies - Choice Of Process Models - Structured Methods.

UNIT III SOFTWARE ESTIMATION TECHNIQUES   (9)

Software Effort Estimation: Problems with over and under Estimations - Basis of Software Estimation - Software Estimation Techniques - Expert Judgement - Estimation by Analogy. Activity Planning: Project Schedules - Projects and Activities - Sequencing and Scheduling Activities - Networks Planning Models - Formulating a Network Model.

UNIT IV RISK MANAGEMENT   (9)

Risk Management: Nature of Risk - Managing Risk - Risk Identification and Analysis - Reducing the Risk. Resource Allocation: Scheduling resources - Critical Paths - Cost Scheduling - Monitoring and Control: Creating Framework - Cost Monitoring - Prioritizing Monitoring.

UNIT V SOFTWARE QUALITY MANAGEMENT   (9)

Defining Software Quality - ISO9126 – Product and Process Metrics – Product vs Process Quality Management – Quality Management Systems – Process Capability Models – Techniques to help enhance Software Quality – Testing – Software Reliability – Quality Plans.

TOTAL: 45

Approved by Third Academic Council

TEXT BOOK:

1. Bob Hughes & Mike Cotterell, "Software Project Management", Tata McGraw – Hill Publications, Fifth Edition, 2012.

REFERENCES:

1. S.A. Kelkar, "Software Project Management", PHI, New Delhi, Third Edition, 2013.
2. Richard H. Thayer, "Software Engineering Project Manangement", IEEE Computer Society.
3. Futrell, "Quality Software Project Management", Pearson Education India, 2008.

Mapping of Course Outcome and Programme Outcome

COs	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x	x	x	x	x	x
2	x	x	x	x	x	x	x		x	x	x	x
3				x	x	x		x			x	x
4					x	x		x	x	x		

Mapping of COs and Pos

11

	L	T	P	C

13CA511   **SOFTWARE TESTING LABORATORY**   **L   T   P   C**
                                                                  0   0   3   2

OBJECTIVES:

- To get the knowledge on the fundamentals of software testing tools.

- To get practical knowledge and comprehensive coverage of various software testing methods.

- To develop test cases and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

On completion of this course the student able

CO1. To apply the Software Testing concepts in the projects.

CO2. To acquire knowledge on various software testing tools.

CO3. To design the test cases for the software project.

CO4. To use the techniques, skills and modern software testing tools necessary for testing.

LIST OF EXPERIMENTS

1. Develop a SRS for any one application.

2. Draw the design for any one application.(Data Flow Diagram)

3. Create a use case design, test case design and bug report for Flight Reservation System.

4. Implement context sensitive mode, analog mode to check the GUI object properties as well as mouse movements and keyboard inputs.

5. Implement the GUI Checkpoint for single property.

6. Implement the GUI Checkpoint for object Window

7. Implement the synchronization point to avoid timing problem.

8. Implement the Data Driven Concept to achieve the regression testing

9. Implement the POPUP-EXCEPTION Concept to eliminate pop-up window exception during testing.

10. Implement the TSL-EXCEPTION Concept to eliminate TSL exceptions during testing process.

Mapping of Course Outcome and Programme Outcome

COs	Pos											
---	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x				x	x
2	x	x	x	x	x	x	x	x	x	x		x
3		x	x		x	x	x		x	x		x
4				x	x	x	x		x	x	x	x

13

	L	**T**	**P**	**C**
	3	**0**	**0**	**3**

13CAX06   **CLOUD COMPUTING**

 OBJECTIVES:

- To introduce the broad perceptive of cloud architecture and model.

- To understand the concept of developing of cloud Services.

- To be familiar with the lead players in cloud.

- To know different cloud programming models as per need.

COURSE OUTCOMES:

On completion of this course the student able to

CO1. Identify the architecture, infrastructure and delivery models of cloud computing.

CO2. Choose the appropriate cloud player, Programming Models and approach.

CO3. Compare the strengths and limitations of cloud computing.

CO4. Design Cloud Services and Set a private cloud.

UNIT I   UNDERSTANDING CLOUD COMPUTING   (7)

Cloud Computing – History of Cloud Computing - Cloud Architecture – Cloud Storage – Need for Cloud Computing - Advantages and Disadvantages of Cloud Computing - Companies in the Cloud Today – Cloud Services.

UNIT II   DEVELOPING CLOUD SERVICES   (10)

Web–Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III   USING CLOUD SERVICES   (10)

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – String and Sharing Files.

UNIT IV   OUTSIDE THE CLOUD   (9)

Evaluating Web Mail Services – Evaluating Instant Messaging – Evaluating Web Conference Tools – Creating Groups on Social Networks – Evaluating on Line Groupware – Collaborating via Blogs and Wikis.

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UNIT V   STORING AND SHARING   **(9)**

Understanding Cloud Storage – Evaluating on Line File Storage – Exploring on Line Book Marking Services – Exploring on Line Photo Applications – Exploring Photo Sharing Communities – Controlling it with Web Based Desktops.

TOTAL: 45

TEXT BOOK:

1. Michael Miller, "Cloud Computing", Pearson Education, New Delhi, 2009.

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G.Dongarra, " Distributed and Cloud Computing, from Parallel Processing to the Internet of Things", Morgan Kautomann Publishers, 2012.

2. Ronald L.Krutz, Russal Dean Vines, "Cloud security- A Comprehensive Guide to Secure cloud computing", Wiley – India, 2010.

3. Kailash Jayaswal, Jayannath Kallakurchi, Donald J.Houde, Dr. Deven shan and Kogent, "Cloud Computing", Learning solutions Inc, Black Book.

4. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach, TMH, 2009.

5. Kumar Saurabh, "Cloud Computing – Insights into New-Era Infrastructure", Wiley India, 2011.

Mapping of Course Outcome and Programme Outcome

COs	Mapping of COs and Pos											
	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x		x	x	x	x		x	
2		x	x	x		x	x	x	x	x	x	x
3	x		x			x	x			x	x	x
4			x	x	x	x	x	x	x	x	x	x

15

Approved by Third Academic Council

13CAX07   **ETHICAL HACKING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn various hacking techniques and attacks.

- To know how to protect data assets against attacks from the Internet.

- To assess and measure threats to information assets.

- To understand the benefits of strategic planning process.

- To evaluate where information networks are most vulnerable.

COURSE OUTCOMES:

On completion of this course, a student should be able to

CO1. Have awareness about various hacking techniques and attacks.

CO2. Defend hacking attacks and protect data assets.

CO3. Defend a computer and a LAN against a variety of different types of security attacks using a number of hands-on techniques.

CO4. Practice and use safe techniques on the World Wide Web.

UNIT I HACKING WINDOWS   **(9)**

Hacking windows – Network hacking – Web hacking – Password hacking. A study on various attacks – Input validation attacks – SQL injection attacks – Buffer overflow attacks – Privacy attacks.

UNIT II TCP/IP   **(9)**

TCP / IP – Checksums – IP Spoofing port scanning, DNS Spoofing. Dos attacks – SYN attacks, Smurf attacks, UDP flooding, DDOS – Models. Firewalls – Packet filter firewalls, Packet Inspection firewalls – Application Proxy Firewalls. Batch File Programming.

UNIT III FUNDAMENTALS OF COMPUTER FRAUD   **(9)**

Fundamentals of Computer Fraud – Threat concepts – Framework for predicting inside attacks –Managing the threat – Strategic Planning Process.

UNIT IV ARCHITECTURE   **(9)**

Architecture strategies for computer fraud prevention – Protection of Web sites – Intrusion detection system – NIDS, HIDS – Penetrating testing process – Web Services– Reducing transaction risks.

UNIT V KEY FRAUD INDICATOR SELECTION PROCESS CUSTOMIZED   **(9)**

Forensics – Computer Forensics – Journaling and it requirements – Standardized logging criteria – Journal risk and control matrix – Neural networks – Misuse detection and Novelty detection.

TOTAL: 45

Approved by Third Academic Council

REFERENCES:

1. Kenneth C.Brancik, "Insider Computer Fraud", Auerbach Publications Taylor & Francis Group, 2008.

2. Ankit Fadia, " Ethical Hacking", Macmillan India Ltd, Second Edition, 2006.

Mapping of Course Outcome and Programme Outcome

	Mapping of COs and Pos											
COs	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x		x	x	x	x
2				x	x	x	x		x		x	x
3				x	x	x	x	x	x	x	x	x
4				x	x	x	x	x	x	x	x	x

Approved by Third Academic Council

13CAX08   **PARALLEL AND DISTRIBUTED COMPUTING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide an understanding of the basic principles on which the internet and other distributed systems are based on their architecture, algorithms and design.
- To learn about various techniques and concepts in parallel and distributed computing.
- To learn how to sustain in problematic situations.

COURSE OUTCOMES:

On completion of this course the student will be

CO1. Able to know about distributed environment and parallel computational environments.

CO2. Able to know about Security, Data Replication, Group Communication, Distributed file systems.

CO3. Able to gain knowledge about Fault Tolerance and Distributed Transactions.

UNIT I   INTRODUCTION TO DISTRIBUTED ENVIRONMENT (8)

Introduction – Client–Server Paradigm – Threads in Distributed Systems – Remote Procedure Call – Remote Object Invocation – Message-Oriented Communication - Unicasting – Group Communication – Reliable and Unreliable Multicasting.

UNIT II   INTRODUCTION TO PARALLEL COMPUTERS AND COMPUTATION (8)

Introduction to Parallelism and Computing - Parallel Machine Model - Parallel Programming Model - HPC/HTC models.

UNIT III DESIGNING PARALLEL ALGORITHMS (10)

Methodical Design - Partitioning - Communication - Agglomeration - Mapping. Design and Development of Parallel Processing Systems - Unix Workstation Clusters - Master Slave Programming - Multi-threaded Programming - Scheduling – Concurrency.

UNIT IV FAULT TOLERANCE AND DISTRIBUTED FILE SYSTEMS (10)

Introduction to Fault Tolerance – Distributed Commit Protocol – Distributed File System Architecture – Issues in Distributed File Systems – Sun NFS.

UNIT V CASE STUDIES (9)

Distributed Object-Based System – CORBA – COM – Distributed Coordination Based System – JINI – Matrix Vector Multiplication – Combinatorial Search.

TOTAL: 45

Approved by Third Academic Council

REFERENCES:

1. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Pearson Education Asia, Third Edition, 2002.

2. Mukesh Singhal, "Advanced Concepts in Operating Systems", McGraw Hill Series in Computer Science, 1994.

3. Grama A., Kumar V., Gupta A., "An Introduction to Parallel Computing, Design and Analysis of Algorithms", Addison Wesley, Second Edition, 2003.

4. Quinn M J, "Parallel Computing: Theory and Practice", McGraw Hill, 1996.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x		x	x	x	x		x	
2	x	x	x	x	x	x	x	x	x	x	x	x
3				x	x	x	x	x	x	x	x	x

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13CAX09   **WEB MINING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the different knowledge discovery issues in data mining from the world wide web.
- To analyze the different algorithms commonly used by Web application.
- To apply the role played by Web mining in Information retrieval and extraction
- To learn the documents structures and grouping
- To learn to use the probabilistic model for web mining
- To learn to develop applications using Web mining

COURSE OUTCOMES:

On completion of this course the student will be able to

CO1. Identify application areas for web content mining, web structure mining and web usage mining.

CO2. Design to retrieval the web data

CO3. Develop schemes to crawl the web data, organize and index

CO4. Cluster the documents for fast access

CO5. Select between different approaches and techniques of web mining and develop algorithms are used by web mining applications.

UNIT I   INTRODUCTION   **(9)**

Overview of Data mining – Data mining from a Business Perspective – Data types, Input and output of data mining algorithms- Decision Tree- Classification and Regression Trees – Preprocessing and Post processing in Data mining

UNIT II   INFORMATION RETRIEVAL   **(9)**

Information Retrieval and Text Mining - Keyword Search - Nearest-Neighbor Methods – Measuring Similarity - Web-Based Document Search - Document–Matching - Inverted Lists - Evaluation of Performance - Structure in a Document Collection - Clustering Documents by Similarity- Evaluation of Performance - Information Extraction - Patterns and Entities from Text- Co reference and Relationship Extraction - Template Filling and Database Construction

UNIT III   WEB SEARCH   **(9)**

Crawling the web – HTML and HTTP Basics – Crawling Basics – Engineering Large Scale Crawlers- Putting together a Crawler- Boolean Queries and the Inverted Index – Relevance Ranking – Similarity Search

UNIT IV   LEARNING   **(9)**

Similarity and Clustering – Formulations and approaches- Bottom up and Top down Partitioning Paradigms – Clustering and Visualization via Embeddings – Probabilistic Approaches to clustering– Collaborative Filtering – Supervised Learning – Semi Supervised Learning

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UNIT V APPLICATIONS (9)

Social Network Analysis- Social Sciences and Bibliometry – Page Rank and HITS – Short comings of coarse Grained Graph model- Enhanced Models and Techniques- Evaluation of Topic Distillation- Measuring and Modeling the Web – Resource Discovery – Collecting Important Pages Preferentially – Similarity Search Using Link Topology – Topical Locality and Focused Crawling – Discovering Communities- The Future of Web Mining.

TOTAL: 45

REFERENCES :

1. Sholom Weiss, "Text Mining: Predictive Methods for Analyzing Unstructured Information", Springer, 2005.

2. Hercules Antonio Do Prado, Edilson Fernada, " Emerging Technologies of Text Mining: Techniques and Applications", Information Science Reference (IGI), 2008.

3. Min Song, Yi-fang Brrok Wu, "Handbook of Research on Text and Web Mining Technologies", Vol I & II, Information Science Reference (IGI),2009.

4. Soumen Chakrabarti ," Mining the Web : Discovery Knowledge from Hypertext Data" , Elsevier Science, 2003.

5. K.P.Soman,Shyam Diwakar, V.Ajay, " Insight into Data Mining Theory and Practice ", Prentice Hall of India Private Ltd, 2006.

6. Anthony Scime, "Web Mining Applications and Techniques", Idea Group Publishing, 2005.

7. Margret H.Dunham, "DATA MINING - Introductory and Advanced Concepts", Pearson Education, 2003.

8. R. Kosala and H. Blockeel, "Web Mining Research: A Survey", SIGKDD Exploration, Vol. 2, Issue 1, 2000.

9. J. Srivastava et al, "Web Usage Mining: Discovery and Applications of Usage Patterns from Web Data", SIGKDD Exploration, Vol. 2, Issue 1, 1999.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x			x	x	x	x			
2		x	x		x	x	x	x	x	x	x	x
3		x	x	x	x	x	x	x	x	x	x	x
4		x	x	x	x	x	x	x	x	x	x	x
5		x	x	x	x	x	x	x	x	x	x	x

Approved by Third Academic Council

13CAX10   **SOFT COMPUTING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the key aspects of Soft Computing.

- To learn the basic concepts of Neural Networks, Genetic Algorithm and Fuzzy Logic and to get exposure to many real world control problems.

COURSE OUTCOMES:

On completion of this course the student will have the

CO1. Ability to know about fundamentals of Soft Computing

CO2. Ability to implement machine learning through neural networks.

CO3. Ability to gain Knowledge to develop Genetic Algorithm and by using it solve the optimization problem.

CO4. Ability to understand fuzzy concepts and system implementation.

UNIT I   ARTIFICIAL INTELLIGENCE   **(9)**

Introduction – Intelligent Agents – Agents and Environments – Good Behavior – Nature of Environments – Structure of Agents – Problem solving – Solving Problems by Searching – Problem Solving Agents – Example problems – Uninformed search Strategies – Avoiding Repeated States – Searching with Partial Information.

UNIT II   NEURAL NETWORKS   **(9)**

Neural Network Theory – Components and Terminology – Topologies – Comparing Neural Networks and other Information Processing Methods – Pre-processing - Post Processing – Implementation of Neural Networks – Implementation Issues - Back Propagation Implementation– Kohonen Network Implementation.

UNIT III   GENETIC ALGORITHM   **(9)**

Introduction to Genetic Algorithm – Computer Implementation of Genetic Algorithm – Some applications of Genetic Algorithms.

UNIT IV   FUZZY SET THEORY   **(9)**

Fuzzy System Theory – Fuzzy Sets and Fuzzy Logic – Approximate Reasoning –Fuzzy Systems Implementation – Issues – Fuzzy Rule system – Evolving Fuzzy Rule Systems.

UNIT V CASE STUDIES: ROBOTICS   **(9)**

Introduction – Robot Hardware - Robotic Perception – Planning to move – Planning Uncertain Movements – Moving – Robotic Software Architectures – Application Domains.

TOTAL: 45

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TEXT BOOKS:

1. Stuart Russell, Peter Norving, "Artificial Intelligence A Modern Approach" , Fifth Impression, Second Edition, 2008. [Unit 1 & Unit 5]

2. Russell C Eberhart, Yuhui Shi, "Computational Intelligence: Concepts to Implementations", AP Professional, 2009. [Unit 2 & 4 Unit]

3. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989. [Unit 3]

REFERENCES:

1. S.N.Sivanandam, S.N.Deepa, "Principles of Soft Computing", Wiley India (P) Ltd, First Edition, 2007.

2. Simon Haykin, "Neural Networks, A Comprehensive Foundation", Addison Wesley Longman, Second Edition, 2001.

3. Timothy J. Ross, "Fuzzy Logic with Engineering Application", Tata McGraw Hill, 1977.

4. S. Rajasekaran , G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.

Mapping of Course Outcome and Programme Outcome

COs	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x		x	x				x	
2				x	x	x	x	x	x	x	x	x
3				x	x	x	x		x	x	x	x
4	x	x	x				x		x	x	x	x

Approved by Third Academic Council

		L	**T**	**P**	**C**
13CAX11	**ADVANCED DATABASE MANAGEMENT SYSTEM**	**3**	**0**	**0**	**3**

OBJECTIVES:

- To understand the advanced DBMS concepts using SQL Server.
- To learn about sub queries, triggers and procedures.
- To know about Transaction, Locking and recovery in SQL Server.

COURSE OUTCOMES:

On completion of this course the student will be

CO1. Able to apply knowledge on creation of database and perform various operations on tables.

CO2. Able to create stored procedures and cursors.

CO3. Able to develop applications connected to SQL Server.

UNIT I   SQL SERVER OVERVIEW   (9)

SQL Server Architecture - Working with SQL Server - Creating Database - Modifying & Deleting Database - Creating, Modifying and Deleting Tables. Data Integrity - Types of data Integrity - using Constraints and Rules – Planning and Creating Indexes, Index Architecture.

UNIT II   QUERY, VIEW, JOINING   (9)

Introduction to Queries, Nested Queries, Using exist, not exist, like , not like, in, between and other functions – Summarizing Data, using Aggregate Function, Group By Fundamentals, Listing Top Values, using Compute And Compute by Keyword –Defining View and Advantage of View.

UNIT III   TRIGGERS, PROCEDURE & CURSOR   (9)

Defining Triggers, Examples of Triggers – Implementing User Defined Procedures. Creating and Executing Procedures - Stored Procedure – Declaring – opening, fetching and closing a cursor.

UNIT IV   TRANSACTION & LOCKING MECHANISM   (9)

ACID – Properties Isolation Levels – Types of New Isolation level in SQL Server 2005 - Fundamentals of Locks – Row, Page & Table level Locks – Advantage and Disadvantage of Lock in OLTP Systems.

UNIT V   HIGH AVAILABILITY OF SERVER   (9)

Disaster Recover – Failover Clustering – Log Shipping – Database Mirroring – What is Replication – Types of Replication.

`   **TOTAL: 45**

Approved by Third Academic Council

TEXT BOOKS:

1. Abraham Silberschatz, Hentry F.Korth and S.Sudharssan,"Database System Concepts", Tata McGraw Hill, Fourth Edition, 2002.

2. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Pearson Education/Addison Wesley, Fifth Edition, 2007.

REFERENCES:

1. C.J.Date, A.Kannan and S.Swamynathan,"An Introduction to Database Systems", Pearson Education, Eighth Edition, 2006.

2. Robert Vieira, "Professional SQL Server 2005 Programming", Wiley Publication.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x		x		x			
2			x	x	x		x		x	x	x	x
3				x	x	x	x	x	x	x	x	x

Approved by Third Academic Council

	L	T	P	C
13CAX12 **ADVANCED OPEN SOURCE DATABASE**	3	0	0	3

OBJECTIVES:

- To understand the basics in advanced DBMS concepts using PostgreSQL.

- To understand what is a good database design.

- To implement the storing & accessing data from database with Java.

COURSE OUTCOMES:

On completion of this course the student will be

    CO1. Frame a well structured & normalised database.

    CO2. Administrate the database.

    CO3. Recover a database from transaction failure.

    CO4. Lock data between transactions.

UNIT I   INTRODUCTION TO POSTGRESQL   **(9)**

Programming with Data- Constant Data, Flat Files for Data Storage, Repeating Groups and Other Problems; DBMS - Database Models, Query Languages, Responsibilities; PostgreSQL- History, Architecture, Data Access; Relational Database Principles.

UNIT II   ACCESSING DATA   **(9)**

Getting Started with PostgreSQL – Installing in Various Platforms - Creating the Sample Database- Accessing Your Data - Data Interfacing- Adding, Updating, Deleting Data - Advanced Data Selection - Aggregate Functions, Subquery, Joins.

UNIT III   DATA MANAGEMENT & SECURITY   **(9)**

Data Definition- Data Types; Data Manipulation - Table Management - Views - Foreign Key Constraints; Transactions- ACID Rules, Single User & Multiple User transactions; Locking.

UNIT IV POSTGRESQL PROCEDURES & ADMINISTRATION   **(9)**

Operators, Built-in Functions, Procedural Languages - Stored Procedures - SQL Functions- Triggers; PostgreSql Administration: System Configuration - PostgreSQL Internal Configuration - Database Backup and Recovery.

UNIT V DATABASE DESIGN & PROGRAMMING POSTGRESQL WITH JAVA   **(9)**

Database Design : Good database design **-** Stages in Database Design- Converting to a Physical Model - Normal Forms - Common Patterns; Accessing PostgreSQL from Java : Using a PostgreSQL JDBC Driver- Making Database Connections- Working with JDBC Result Sets-Creating JDBC Statements

TOTAL: 45

Approved by Third Academic Council

TEXT BOOK:

1. Neil Matthew and Richard Stones, "Beginning Databases with PostgreSQL", A press, Second Edition, 2005.

REFERENCES:

1. Bruce Momjian, "PostgreSQL Introduction and Concepts", Addison–Wesley, First Edition, 2001.
2. Korry Douglas, Susan Douglas, "PostgreSQL, 2nd Edition" Sams, Second Edition, 2005.
3. Regina Obe and Leo Hsu, "PostgreSQL: Up and Running", O'Reilly, First Edition, 2012.
4. Postgresql Manuals – http://www.postgresql.org/docs/
5. Database System Concepts - http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x		x	x			x	x
2		x	x	x	x	x	x	x	x	x	x	
3		x	x	x	x		x		x	x	x	x
4				x	x	x	x	x	x	x	x	x

27

13CAX13   **DYNAMIC PROGRAMMING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand basic concepts in dynamic programming using Ruby on Rail.

- To understand the Rail Framework.

- To understand programming constructs of Ruby

- To deploy Ruby on Rails.

COURSE OUTCOMES:

On completion of this course the student will

CO1. Be able to use Rails and also program constructs of Ruby.

CO2. Be able to develop application in Ruby on Rail.

CO3. Acquire knowledge about Object-Relational Mapping with ActiveRecord.

CO4. Apply knowledge to deploy Rails.

UNIT I INTRODUCTION ON RAILS   **(8)**

What Is Rails?- History of Rails- Installing Rails- Editors and IDEs- Understanding Rails- Misconceptions about Rails- Understanding MVC- Rails' Standard Packages- Rails' Main Principles- Rails vs. ASP.NET vs. ASP.NET MVC.

UNIT II INTRODUCTION ON RUBY   **(9)**

What's Ruby? – Hello Application – IRB- RI- Data Types - Programming Ruby - Defining Methods – Conditionals – Looping - Exception Handling - Objects and Classes - Modules and Mixins – Metaprogramming - Method Name Resolution - Alternative Ruby Implementations.

UNIT III RUBY APPLICATION   **(10)**

Creating a New Rails Application - Scaffolding and Migrations - RESTful Application - Analyzing the Model - Analyzing the Controller - Analyzing the View Layer - Adding Partials - Adding Validations - Adding a Bit of Style - Setting a Default Time Zone - Adding Support for Textile - Using named_scope - Adding a Custom REST Action. Incremental Development, Logging, and Debugging - Adding Pagination - Adding Comments - Defining Associations - Nested Resources - Runtime Environments – Logging - Debugging - Rails Directory Structure.

UNIT IV OBJECT-RELATIONAL MAPPING   **(10)**

Supported Databases - ActiveRecord Outside of Rails - Object-Relational Mapping - CRUD Operations - ActiveRecord Associations - ActiveRecord Validations - Advanced ActiveRecord - Testing Models - Handling Requests with ActionController - Defi ning Routes with map.connect - Named Routes - RESTful

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Routes - Working with Controllers – Rendering - Accessing the Request and Response Environment - Maintaining the State – Filters - Testing Controllers.

UNIT V RENDERING THE USER INTERFACE (8)

Working with Templates - Built-in Template Engines - Adding an RSS and Atom Feed – Helpers - Adding a Sprinkle of Ajax – Alternatives. ActiveResource and Web Services – Security - Performance and Optimization - Deploying Rails.

TOTAL: 45

TEXT BOOK:

1. Antonio Cangiano, "Ruby on Rails - Bible", Wiley Publishing Inc., 2009.

REFERENCES:

1. David A. Black, "Ruby for Rails", ISBN: 1932394699, Manning Publications; First Edition 2006.
2. Peter Cooper, "Beginning Ruby: From Novice to Professional", ISBN: 1590597664, Apress; First Edition, 2007.
3. David Flanagan and Yukihiro Matsumoto, "The Ruby Programming Language", ISBN: 0596516177, O'Reilly Media; First Edition, 2008.
4. Dave Thomas, Chad Fowler, and Andy Hunt, "Programming Ruby: The Pragmatic Programmers' Guide", ISBN: 0974514055, Pragmatic Bookshelf, Second Edition, 2004.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x			x	x	x	x
2			x	x	x		x		x	x	x	x
3		x	x		x	x		x		x	x	x
4				x	x		x	x	x	x	x	x

29

	L	**T**	**P**	**C**

13CAX14   **SCRIPTING LANGUAGE PROGRAMMING**   **3**   **0**   **0**   **3**

OBJECTIVES:

- To understand basics of scripting language programming concepts using Python.
- To learn the usage of Python syntax.
- To learn and use the Object Oriented paradigm in Python programs
- To understand the usage of Python Regular Expression capabilities for data verification.

COURSE OUTCOMES:

On completion of this course the student will have the

CO1. Ability to gain knowledge in Python.

CO2. Ability to analyse and synthesis program.

CO3. Ability to solve problem using Python.

CO4. Ability to create software's using Python language.

UNIT I   AN INTRODUCTION TO PYTHON & BASIC PYTHON SYNTAX   **(9)**

Brief History of Python – Python Versions – Installing Python Environment - Variables - Executing Python from the Command Line - Editing Python Files – Dynamic Types - Python Reserved Words - Naming Conventions - Basic Syntax - Comments – String Values - String Operations – String Operators - Numeric Data Types - Conversions - Simple Input and Output.

UNIT II   LANGUAGE COMPONENTS & COLLECTIONS   **(9)**

Introduction - Control Flow and Syntax - Indenting - If Statement - Relational Operators - Logical Operators - True or False – Bit-wise Operators - While Loop - Break and Continue, For Loop - Collections -Introduction - Lists - Tuples - Sets - Dictionaries - Sorting Dictionaries - Copying Collections.

UNIT III   FUNCTIONS & MODULES   **(9)**

Introduction, Defining Functions Parameters - Function Documentation - Keyword and Optional Parameters - Passing Collections to a Function - Variable Number of Arguments - Scope - Functions - Passing Functions to a Function - Mapping Functions in a Dictionary – Lambda Closures. Modules: Modules - Standard Modules – sys, Standard Modules – math, Standard Modules – time, dir Function.

UNIT IV   EXCEPTIONS & INPUT AND OUTPUT   **(9)**

Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, Writing Your Own Exception Classes. Data Streams, Creating Your Own Data Streams, Access Modes Writing, Data to a File Reading, Data From a File, Additional File Methods, Using Pipes as Data Streams, Handling IO Exceptions, Working with Directories, Metadata, The pickle Module.

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UNIT V   CLASSES IN PYTHON & REGULAR EXPRESSIONS   **(9)**

Classes Principles of Object Orientation - Creating Classes - Instance Methods - File Organization - Special Methods - Class Variables - Inheritance - Polymorphism - Type Identification - Custom Exception Classes - Class Documentation – pydoc. Simple Character Matches - Special Characters - Character Classes - Quantifiers - Dot Character - Greedy Matches - Grouping - Matching at Beginning or End - Match Objects - Substituting - Splitting a String - Compiling Regular Expressions - Flags.

TOTAL: 45

TEXT BOOKS:

1.   Naomi R. Ceder , "The Quick Python Book", Second Edition, January 15, 2010.

2.   Martin C. Brown, "PYTHON: The Complete Reference", McGraw-Hill, 2001.

REFERENCES:

1.   David M. Beazely, "Python Essential Reference", 4th Edition, Addison-Wesley Professional; Fourth Edition, 2009.

2.   John V. Guttag, "Introduction to Computation and Programming Using Python", MIT Press; Spring 2013 ed Edition, 2013.

3.   Paul Barry, "Head First Python Paperback – Import", O'Reilly, First Edition, 21 Dec 2010.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x				x	x	x			
2		x	x		x				x	x	x	x
3		x	x	x	x	x	x	x	x	x	x	x
4						x	x			x	x	x

Approved by Third Academic Council

13CAX15   **J2EE TECHNOLOGIES**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand advanced concepts in java.
- To learn about server side scripting and component creation using java.
- To learn about Javamail, Java Beans, Structs etc.
- To learn about web services and its protocols.

COURSE OUTCOMES:

On completion of this course the student will be

    CO1. Able to use advanced Java programming concepts.
    CO2. Creating java server side scripting.
    CO3. Developing well-architected Web applications.
    CO4. Identifying web services and applying them on the web.

UNIT – I   INTRODUCTION & DATABASE PROGRAMMING   (9)

J2EE Platform – Enterprise architecture styles – J2EE run times – J2EE API – J2EE architecture – Containers – Introduction to J2EE technologies – Naming and directory services.

Database programming with JDBC – JDBC/ODBC bridge – Establishing a connection – Creating and executing SQL statements – Querying – Report statements – Scrollable and updatable result sets – Java.sql packages – JDBC data sources – Connection pooling.

UNIT – II   SERVLET & JSP   (9)

Servlet Architecture – Servlet Interface – Servlet HTTP Interfaces – Request Processing – Response Generation – Session Management – Servlet Deployment

Java Server Pages : Introduction to JSP – JSP Directives – Scripting elements – Standard Actions – Implicit objects – Scope – JSP pages as XML documents – JSP Sample Program – Design Strategies – JSP tag Extensions–A simple TAG – Writing TAG Extensions.

UNIT – III JAVAMAIL & CORBA   (9)

Java Mail API: Introduction to Java Mail – Mail Protocols – Java Mail Overview – Quick, Send me a Email (An example program)

CORBA – Interface Definition language – Object Request Broker – system object model – portable object adapter – CORBA services – CORBA component model – containers – application server – model driven architecture.

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UNIT- IV   ENTERPRISE JAVA BEANS   (9)

Overview of EJB – EJB Middleware Architecture – EJB Architecture – EJB Containers and its services – Design of EJB Tier – Session java Beans – Stateless and Stateful Beans, Entity Beans and Persistence – Container Vs Bean Managed Persistence, Message Driven Bean – Relationships, EJB Container Services.

UNIT V   STRUTS & WEB SERVICE TECHNOLOGIES   (9)

Struts Framework: Introduction – Building a simple struts – Model layers – View layer – controller layer – Validator – Tiles – Declarative Exception Handling – Strut Modules.

WEB SERVICES: SOAP – WSDL – UDDI – JAXP – JAXB

TOTAL: 45

TEXT BOOKS:

1.   Jim Keogh, "The Complete Reference J2EE", Tata McGraw – Hill, 2002.

2.   James Holmes, "The Complete References Struts", Second Edition, Tata McGraw Hill Edition – 2007.

3.   Paul J Perrone, Venkata S.R. Krishna R and Chayanti, "Building Java Enterprise Systems with J2EE", Techmedia , New Delhi, 2000.

REFERENCES:

1.   Jusin Couch, Daniel H. Steinberg, "J2EE Bible", Wily India (P) Ltd, New Delhi, 2002.

2.   Paul Tremblett, "Instant Enterprise Java Y-Beans", Tata McGraw Hill Publishing Company, New Delhi, 2001.

Mapping of Course Outcome and Programme Outcome

COs	Mapping of COs and POs											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x	x		x		x	x	x	x
2			x		x		x	x	x	x	x	x
3		x	x	x	x	x	x	x	x	x	x	x
4	x	x		x	x	x	x	x	x	x	x	x

Approved by Third Academic Council

13CAW01 **ADVANCED DATABASE MANAGEMENT SYSTEM LABORATORY**

L	T	P	C
0	0	2	1

OBJECTIVES:

- To learn the fundamental concepts in SQL Server.
- To learn about sub queries, triggers and procedures.
- To know how to connect SQL Server with front-end.

COURSE OUTCOMES:

On completion of this course the student will be

CO1. Able to apply practical knowledge on creation of database and perform various operations on tables.

CO2. Able to implement stored procedures and cursors.

CO3. Able to develop applications connected to SQL Server.

LIST OF EXPERIMENTS:

1. DDL & DML – data types, create, alter, drop table, integrity constraints
2. Insert, delete and update commands
3. DCL & TCL – grant, revoke, rollback and commit
4. Select command using logical operators, order by, group by clause etc.
5. Join query concept
6. Database objects – view, index, sequence – create, alter and drop
7. Function – definition and implementation
8. Database triggers
9. Stored procedures
10. Record management using cursors
11. Develop an application using Database Connectivity

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x		x		x	x	x	x
2		x	x		x	x		x		x	x	x
3			x	x	x		x	x	x	x	x	x

13CAW02   **ADVANCED OPEN SOURCE DATABASE LABORATORY**   L T P C
0 0 2 1

OBJECTIVES:

- To learn the fundamental concepts in PostgreSQL.

- To learn about sub queries, triggers and procedures.

- To know how to connect PostgreSQL with front-end.

COURSE OUTCOMES:

On completion of this course the student will be

CO1. Able to know basics in administrating the database.

CO2. Able to apply practical knowledge on creation of database and perform various operations on tables.

CO3. Able to implement stored procedures and cursors.

CO4. Able to store and retrieve data from database with the front-end Java.

LIST OF EXPERIMENTS:

Basic SQL

1. Setting up and Getting Familiar with PostgreSQL/PGAdmin3

    - Install PostgreSQL and pgadmin and configure

    - connect to PostgreSQL using either the psql command line interface, or using pgAdmin3.

    - Administering PostgreSQL and Creating Users

2. DDL

    - Data Types

    - Schema creation, Alter and deletion

3. DML

    - Insert, select, delete and update commands

Intermediate SQL

4. Integrity constraints

5. Aggregates functions, Subquery and Joins.

6. Database objects – view, index, sequence – create, alter and drop

35

Advanced SQL

7. Functions.

8. Stored procedures and triggers

9. DCL & TCL – grant, revoke, rollback and commit

10. Develop a package using database connectivity

Mapping of Course Outcome and Programme Outcome

Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x	x		x	x	
2		x	x		x		x		x	x		x
3				x	x	x	x		x	x	x	x
4					x	x	x	x	x	x	x	x

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DYNAMIC PROGRAMMING LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To learn dynamic programming concepts using Ruby on Rail.

- To understand the Rail Framework.

- To gain knowledge in programming constructs of Ruby

- To know how to deploy Ruby on Rails.

COURSE OUTCOMES:

On completion of this course the student will

CO1. Be able to work on Rails and also do the program using constructs of Ruby.

CO2. Be able to apply practical knowledge to develop applications in Ruby on Rail.

CO3. Apply object oriented concepts in developing application.

CO4. Apply knowledge to deploy Rails.

LIST OF EXPERIMENTS:

1. Create a ruby program with classes, objects, getter and setter.

2. Create a ruby program that handles File Operations.

3. Create ruby program that connect with database to perform CRUD operation.

4. Create a ruby program with inheritance and modules. Use the module from that presents in different file.

5. Create a rails application with some static web pages. Set index page as a root.

6. Create a rails application with basic authentication with sign-in and sign-out, user must sign in to see the content.

7. Create a rails application with basic association and implement the association with real time application like online shopping, micro blog, etc.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x		x		x	x	x	x
2		x	x		x			x	x	x	x	x
3		x	x	x	x	x	x			x	x	x
4		x	x	x	x	x	x	x	x	x	x	x

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13CAW04   **SCRIPTING LANGUAGE PROGRAMMING LABORATORY**

L	T	P	C
0	0	2	1

OBJECTIVES:

- To understand the scripting language programming concepts using Python.
- To learn the usage of Python syntax.
- To learn and use the Object Oriented paradigm in Python programs
- To understand the usage of Python Regular Expression capabilities for data verification.

COURSE OUTCOMES:

On completion of this course the student will have the

CO1. Ability to install Python

CO2. Ability to analyse and synthesis program.

CO3. Ability to solve problem using Object Oriented paradigm in Python.

CO4. Ability to create applications using Python language.

LIST OF EXPERIMENTS:

1. Python Installation
2. String operations
3. Simple input and output operations
4. Control flow statements
5. Collections
6. Functions
7. Modules
8. Exception Handling
9. File operations
10. Directories
11. Classes
12. Regular Expressions

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x			x	x	x	x	x	x	x	
2		x	x	x	x	x	x		x	x	x	x
3		x	x	x	x		x	x	x	x	x	x
4		x	x	x	x		x	x	x	x	x	x

13CAW05   **J2EE TECHNOLOGIES LABORATORY**

L	T	P	C
0	0	2	1

OBJECTIVES:

- To understand database connectivity using JDBC.

- To learn about server side programming.

- Learn how to develop middleware components using Java Bean, CORBA and EJB.

COURSE OUTCOMES:

On completion of this course the student will be

CO1. Able to use JDBC to connect with front-end.

CO2. Creating java server side scripting.

CO3. Developing well-architected Web applications.

CO4. Apply knowledge about Java Bean, CORBA and EJB for developing various applications.

LIST OF EXPERIMENTS:

1. Develop an application using JDBC.

2. Write a java Program for session tracking.

3. Write a JAVA Servlet Program to implement a dynamic HTML.

4. Write a JAVA JSP Program to implement verification of a particular user login and display a welcome page.

5. Develop a middleware component for retrieving Stock Market Exchange Information using CORBA.

6. Develop a middleware component for retrieving Weather Forecast information using CORBA.

7. Develop a java bean to draw various graphical shapes.

8. Write a JAVA JSP Program to get student information through a HTML and create a JAVA Bean Class, populate Bean and display the same information through another JSP.

9. Develop an Enterprise Java Bean for Library operations.

10. Develop an application using Struts to send an E-Mail.

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Mapping of Course Outcome and Programme Outcome

<table>
<tr><td colspan="13">Mapping of COs and POs</td></tr>
<tr><td rowspan="2">Cos</td><td colspan="12">POs</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr>
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</table>

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13CAX16   **MOBILE APPS DEVELOPMENT**

L	T	P	C
3	0	0	3

OBJECTIVES:

This course aims to teach mobile app development using Android as the development platform.

COURSE OUTCOMES:

At the end of this elective, student shall be able to:

CO1. Appreciate the Mobility landscape

CO2. Familiarize with Mobile apps development aspects

CO3. Design and develop mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.

CO4. Appreciation of nuances such as native hardware play, location awareness, graphics, and multimedia

UNIT I GETTING STARTED WITH MOBILITY   **(7)**

Mobility landscape, Mobile platforms, Mobile appsdevelopment, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development

UNIT II BUILDING BLOCKS OF MOBILE APPS   **(15)**

App user interface designing – mobile UI resources (Layout, UI elements, Draw-able, Menu), Activity-states and life cycle, interaction amongst activities.

App functionality beyond user interface - Threads,Async task,Services – states and lifecycle, Notifications, Broadcastreceivers,Telephony and SMS APIs

Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

UNIT III SPRUCING UP MOBILE APPS   **(9)**

Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope)

UNIT IV TESTING MOBILE APPS   **(8)**

Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk

UNIT V TAKING APPS TO MARKET   **(6)**

Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

TOTAL: 45

42

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TEXT BOOK:

1.   Anubhav Pradhan, Anil V Deshpande, "Mobile Apps Development", First Edition, 2013.

REFERENCES:

1.   Barry Burd, "Android Application Development All in one for Dummies", First Edition, 2013.
2.   "Teach Yourself Android Application Development In 24 Hours", SAMS Publication.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x	x	x	x	x	x	x
2	x	x		x	x	x		x	x	x	x	x
3		x	x	x	x	x	x	x	x	x	x	x
4		x		x	x	x	x	x	x	x	x	x

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13CAX17	**DESIGNING ENTERPRISE APPLICATIONS**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

OBJECTIVES:

The aim of this paper includes designing and developing high quality enterprise applications and other task related to it.

COURSE OUTCOMES:

At the end of this elective, student shall be able to

CO1. Familiarize with concept of Enterprise Analysis and Business Modeling.

CO2. Understand requirements validation, planning and estimation.

CO3. Design and document the application architecture.

CO4. Understand the importance of application framework and designing other application components.

CO5. Construct different solution layers and perform Code review, Code analysis, build process.

UNIT I   (8)

Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications

UNIT II   (9)

Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation

UNIT III   (12)

Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture- design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation ofapplication architecture and design

UNIT IV   (9)

Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

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UNIT V   **(7)**

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

TOTAL: 45

TEXT BOOKS:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu "Raising Enterprise Applications", John Wiley Publication.

2. Brett McLaughlin, "Building Java Enterprise Applications", O'Reilly Media Publication.

REFERENCES:

1. "Software Requirements: Styles & Techniques", Addison-Wesley Professional.

2. "Software Systems Requirements Engineering: In Practice", McGraw-Hill Osborne Media.

3. "Managing Software Requirements: A Use Case Approach", Second Edition, Pearson Publication.

4. "Software Architecture: A Case Based Approach", Pearson Publication.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x	x		x	x		
2	x	x	x		x	x				x		
3		x		x		x		x	x	x	x	x
4	x		x	x	x	x	x		x	x	x	x
5			x		x	x			x	x	x	x

Approved by Third Academic Council

13CA512   **MINI PROJECT**   **L   T   P   C**
                                                                    0   0   2   1

OBJECTIVES:

- To provide the opportunity to the students to demonstrate independence and originality, to plan and organise a large project over a long period.
- To provide the opportunity to specialise in specific areas of Computer Applications.
- To provide opportunity to demonstrate a wide range of skills and knowledge learned.
- To encourage integration of knowledge gained in the previous course.

COURSE OUTCOMES:

At the end of the course the students are able to

CO1. Identify the problem and analyse the project requirements.

CO2. Apply current techniques and software tools necessary for solving complex modules.

CO3. Show their individuality and inspiration in the mini project by designing a specific to real time applications.

CO4. Interpret the data and synthesis the information to derive conclusion for implementation of project.

METHODOLOGY	- Maximum four students per batch. - Faculty guide will be allotted for each batch by the HOD. - By mutual discussion, the faculty guide will assign a title in the general / subject area to the student. - Students have to refer the Journals and magazine and collect the published literature. - Using OHP/Power Point, the student has to make presentation for 15 -20 minutes followed by 10 minutes discussion. - Each batch have to do the project and present the progress of the project by two project reviews ,one at the middle and the other near the end of the semester. - The student batches have to write a Technical Report for about 25 -30 pages (Title page, One page Abstract, Review of Research paper under various subheadings, Concluding Remarks and List of References). The technical report has to be submitted to the HOD one week before the final presentation, after the approval of the faculty guide.

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	Week	Activity
EXECUTION	I	Allotment of Faculty Guide by the HoD
	II	Collection of Technical papers
	III- IV	Finalizing the title with the approval of Faculty Guide
	V	First Project Review
	VI	Progress of the Project
	VII	Second Project Review
	VIII	Report Preparation
	IX	Report submission
	X-XI	Demo & Final presentation

EVALUATION

- **50% by Continuous Assessment + 50% by end semester examination**
- **2 Hrs/week and 1 credit**

Component	Weightage
First Project Review	25%
Second Project Review	25%
Project Report	30%
Demo & Final presentation	20%
Total	**100%**

Approved by Third Academic Council

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x	x	x	x	x	x	x		
2		x	x	x	x		x					x	x
3			x		x	x	x	x	x	x	x	x
4		x	x		x	x	x	x		x	x	x

Approved by Third Academic Council

13PT512	**LANGUAGE AND CAREER PROFICIENCY**	**L**	**T**	**P**	**C**
		0	**0**	**2**	**0**

OBJECTIVES:

- To develop inter personal skills and be an affective goal oriented team player.
- To demonstrate critical and innovative thinking.
- To develop communication and problem solving skills.
- To re-engineer attitude and understand its influence on behaviour.

COURSE OUTCOMES:

At the end of this course, student shall be able to

CO1. Get exposure about the fundamentals of GDs and Interviews.

CO2. Communicate efficiently with team.

CO3. Present the ideas among the team.

CO4. Enhance holistic development of students and improve their employability skills.

UNIT I: JOB APPLICATION WITH RESUME

Writing Application for job – Difference between Bio-data, Resume and Curriculum Vitae – Resume styles – Structuring the resume.

UNIT II: INTERVIEW SKILLS

Pre-interview preparation techniques –Kindsof interviews –Required key skills –Often asked questions – Answering strategies – Corporate culture – Mock interviews.

UNIT III: GROUP DISCUSSION

Nature of GD – Importance of GD skills – Types of GD – Characteristics of successful GD – GD Strategies – Discussing case studies – Client Communication – Inter cultural communication - Mock GD

UNIT IV: PRESENTATION SKILLS

Elements of effective presentation – Structure of presentation- Planning, Preparing and Organizing the ideas – Presentation tools – Voice modulation – Body language – Picture perception.

UNIT V: LANGUAGE AND VOCABULARY

Synonyms – Antonyms – Prefix & Suffix – Articles – Tenses – Voices – Modal Auxiliaries – Concord– Troublesome Prepositions – Prepositional Phrases – Error correction

Continuous Assessment will be done through Mock Interview, Mock GD and Paper Presentation.

TOTAL : 30

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REFERENCES:

1. Rizvi, Ashraf.M, "Effective Technical Communication", Tata McGRaw Hill Publishing Company Limited, New Delhi, 2006.

2. McGrath, E.H., Basics of Managerial Skills, Prentice-Hall of India Private Limited New Delhi. 2007.

3. Clegg., Brain., Time Management. Kogan Page India Pvt.Ltd. New Delhi. 2009.

4. Kher, Ajai. B., Group Discussion, Vohra Publishers and Distributers. New Delhi.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x	x	x	x		
2	x	x		x	x	x	x	x	x	x	x	x
3	x	x	x	x	x	x	x	x	x	x	x	x
4	x	x	x	x	x	x	x	x	x	x	x	x

Mapping of COs and POs

Approved by Third Academic Council

	L	**T**	**P**	**C**
13CA631 **PROJECT WORK**	**0**	**0**	**24**	**12**

OBJECTIVES:

- Understand programming language concepts
- Understand software engineering principles and develop an ability to apply them to software design of real life problems in an industry/ commercial environment.
- Learn to plan, analyze, design and implement software project.
- Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
- Learn about different software development process models and how to choose an appropriate one for a project.

COURSE OUTCOMES:

At the end of the project work students will be able to

CO1. Apply programming language concepts for the project development.

CO2. Apply software engineering principles and have the ability to use them for software design of real life problems in an industry/ commercial environment.

CO3. Acquire knowledge about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases.

CO4. Demonstrate the ability to locate and use technical information from multiple sources.

CO5. Plan, analyze, design and implement a software project.

CO6. Get motivation to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.

CO7. Demonstrate an understanding of professional ethics.

CO8. Demonstrate the ability to communicate effectively in speech.

CO9. Demonstrate the ability to communicate effectively in writing.

CO10. Conceptualize, design, and implement a project with their team.

Approved by Third Academic Council

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x		x			x		
2	x	x	x				x				x	
3		x	x		x	x	x	x	x	x	x	
4		x		x	x		x	x	x	x	x	x
5		x	x	x	x		x	x	x	x	x	x
6				x	x	x	x	x	x	x		x
7		x		x	x	x	x	x				
8		x	x	x		x	x	x	x			
9		x	x	x		x	x	x	x			
10		x	x	x	x	x	x	x	x	x	x	x

(Table header: Mapping of COs and POs)

Approved by Third Academic Council