J.J COLLEGE OF ARTS AND SCIENCE (Autonomous)

Sivapuram Post, Pudukkottai.

(Re-Accredited by NAAC with "A" Grade - Third Cycle)

Department of Computer Applications

Master of **C**omputer **A**pplications – M.C.A.

(For the Students admitted from the Academic Year 2019 - 2020)

Programme Structure

Semester	Course Code	Course Title	Hrs / Week	Credit	Exam Hrs	Marks		Total
						Int	Ext	
I	P1R1CACC1	Digital Computer Fundamentals	5	4	3	25	75	100
	P1R1CACC2	Data Structures and Algorithms	5	4	3	25	75	100
	P1R1CACC3	Database Management System	4	4	3	25	75	100
	P1R1CACC4	Shell Programming using Unix	5	4	3	25	75	100
	P1R1CACC5	OOAD and UML	5	4	3	25	75	100
	P1R1CACC6P	Shell Programming using Unix - Practical	3	2	3	40	60	100
	P1R1CACC7P	RDBMS - Practical	3	2	3	40	60	100
		Total	**30**	**24**	**-**	**-**	**-**	**700**
II	P2R1CACC8	Distributed Operating System	5	4	3	25	75	100
	P2R1CACC9	Programming in JAVA	5	4	3	25	75	100
	P2R1CACC10	Object oriented Programming with C ++	5	4	3	25	75	100
	P2R1CACC11	Data Communication Networks	5	4	3	25	75	100
	P2R1CAEC1	To be selected from the list	4	4	3	25	75	100
	P2R1CACC12P	Programming in JAVA - Practical	3	2	3	40	60	100
	P2R1CACC13P	Object oriented programming with C ++ - Practical	3	2	3	40	60	100
		Total	**30**	**24**	**-**	**-**	**-**	**700**

III	P3ECACC14	Compiler Design	5	4	3	25	75	100
	P3R1CACC15	J2EE Technologies	5	4	3	25	75	100
	P3R1CACC16	Management Information System	5	4	3	25	75	100
	P3R1CACC17	Discrete Mathematics	5	4	3	25	75	100
	P3R1CACC18P	J2EE Technologies - Practical	3	2	3	40	60	100
	P3R1CACC19P	Photoshop and flash - Practical	3	2	3	40	60	100
	P3R1CAEC2	To be selected from the list	4	4	3	25	75	100
	P3R1CAPS1	Recent Advancements in the Field of Computer Applications – A Report	-	2	-	-	-	100
		Total	**30**	**26**	**-**	**-**	**-**	**800**
IV	P4R1CACC20	Mobile Communication	5	4	3	25	75	100
	P4R1CACC21	.NET Technologies	5	4	3	25	75	100
	P4R1CACC22	Accounting for Managers	4	4	3	25	75	100
	P4R1CACC23	Probability and Statistics	4	4	3	25	75	100
	P4R1CACC24P	Mobile computing - Practical	3	2	3	40	60	100
	P4R1CACC25P	.NET Technologies – Practical	3	2	3	40	60	100
	P4R1CAEC3	To be selected from the list	4	4	3	25	75	100
	P4R1CAPS2	Soft skill Development Course	2	2	3	25	75	100
		Total	**30**	**26**	**-**	**-**	**-**	**800**
V	P5R1CACC26	Data Mining and Ware Housing	4	4	3	25	75	100
	P5R1CACC27	Network Security	4	4	3	25	75	100
	P5R1CACC28	PHP and MYSQL	4	4	3	25	75	100
	P5R1CACC29	Marketing Management	4	4	3	25	75	100
	P5R1CACC30	Optimization Techniques	4	4	3	25	75	100

	P5R1CACC31P	Network Security - Practical	3	2	3	40	60	100
	P5R1CACC32P	PHP and MYSQL - Practical	3	2	3	40	60	100
	P5R1CAEC4	To be selected from the list	4	4	3	25	75	100
		Total	**30**	**28**	**-**	**-**	**-**	**800**
VI	P6R1CACC33PW	Project Work	-	**12**	-	-	-	**100**
		Grand Total	**150**	**140**	**-**	**-**	**-**	**3900**

Master of **C**omputer **A**pplications (M.C.A.)

List of Elective Courses

(To be followed from the Academic Year 2019-2020 Onwards)

MASTER OF COMPUTER APPLICATIONS (M.C.A.)

LIST OF ELECTIVE COURSES

(FROM THE ACADEMIC YEAR 2019-2020 ONWARDS)

ELECTIVE – I (SEM II)

1:1. ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

1:2. DIGITAL IMAGE PROCESSING

1:3. MACHINE LEARNING

ELECTIVE – II (SEM III)

2:1. SOFTWARE ENGINEERING

2:2. COMPUTER GRAPHICS

2:3. HUMAN COMPUTER INTERACTION

ELECTIVE – III (SEM IV)

3:1. E-COMMERCE

3:2. SOFTWARE PROJECT MANAGEMENT

3:3. CLOUD COMPUTING

ELECTIVE – IV (SEM V)

4:1. BIG DATA ANALYTICS

4:2. SOFT COMPUTING

4:3. SOFTWARE QUALITY ASSURANCE AND TESTING

PROGRAMME SPECIFIC OBJECTIVES:

- To make the learners have a blend of both theoretical and practical based knowledge
- To understand the importance data structures and its associated algorithms in the development of computer programs
- To gain knowledge in various Programming and scripting languages
- To make the students acquire logical, technical thinking coupled with practical exposure
- To incorporate the latest development in the field of technology
- To make the graduates skill oriented and Job ready

PROGRAMME SPECIFIC OUTCOMES:

- Attainment of fundamental knowledge of the applications of Computers
- Understanding the concept of logical thinking and programming the real world problems
- Gather the sufficient information by Internet surfing
- Ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques
- Ability to create and innovate
- Would have the acquired the knowledge and skill to get rewarding careers
- Able to work as I.T Professionals exhibiting social Responsiveness and ethical behaviour

P1R1CACC1: DIGITAL COMPUTER FUNDAMENTALS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of Digital Computer Fundamentals.
2. To understand the concept of Gates.
3. To gain the knowledge about Flip Flops.
4. To get the knowledge about Combinational and Sequential circuits.
5. To understand the concept of Counters and Registers.

UNIT - I: Binary Systems (Inst Hrs: 12)

Binary Systems - Binary Numbers - Number Base Conversions **(ICT)** - Octal and Hexadecimal Numbers – Complements - Binary Codes - Binary Storage and Registers - Binary Logic -Integrated Circuits.

UNIT - II: Boolean Algebra and Logic Gates (Inst Hrs: 12)

Boolean Algebra and Logic Gates: Basic Definition Axiomatic Definitions of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra – Boolean Functions **(Seminar)** - Canonical and Standard Forms - Other Logic Operations – Digital Logic Gates **(ICT)**.

UNIT - III: Simplification of Boolean Functions (Inst Hrs: 12)

The Map Method **(Assignment)** - Two and Three variable maps - Four Variable Map – Five And Six Variable Map - Product Of Sum (pos) – Simplification - NAND and NOR implementation – other two level implementations - Don't Care Conditions.

UNIT - IV: Combinational Logic (Inst Hrs: 10)

Introduction - Design Procedures – Adders – Subtractors - Code Conversion - Analysis Procedure - Multilevel NAND Circuits – Multilevel NOR circuits - Decimal Adder – Decoders – Multiplexers.

UNIT - V: Sequential logic and Registers and Counters (Inst Hrs: 11)

Sequential Logics - Flip Flops **(ICT)** - Triggering of Flip Flops - Analysis Of Clocked Sequential Circuits. Registers - Shift Registers – Ripple Counters - Synchronous Counters – Other Counters.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned.

TEXT BOOK (S):

1. M. Morris Mano "Digital Logic and Computer Design"-, Pearson Education 2018.

Unit - I: Chapter 1; Unit – II: Chapter 2; Unit - III: Chapter 3;
Unit –IV: Chapter 4; UNIT - V: Chapter 6, 7.

REFERENCE BOOK (S):

1. Thomas Bartee C,"Digital Computer fundamentals", TMH, 3rd edition,2018.
2. Dr.Meena,"Principles of Digital Electronics", Eastern Economy Edition, 2013, PHI.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/digital_electronics/index.asp

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Able to understand about digital computer fundamentals
- Able to gain the knowledge about Boolean algebra and logical gates
- Able to develop the knowledge about flip flops
- Able to improve the knowledge about logical circuit and sequential logic
- Able to provide a concept to represent the register and counter

P1R1CACC2: DATA STRUCTURES AND ALGORITHMS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of data structures.
2. To understand the concepts of tress and graphs.
3. To understand the concept of sorting and searching.
4. To understand the concept of searching.
5. To understand the concept of algorithm design techniques.

UNIT - I: Introduction to Data Structures (Inst Hrs: 12)

Arrays - Ordered List - Representation of Arrays - Stack and Queues **(ICT)** – Evaluation of Expressions - Multiple Stacks and Queues - Linked List – Singly Linked List – Linked Stacks and Queues - Polynomial Addition - Doubly Linked List.

UNIT - II: Trees and Graphs (Inst Hrs: 12)

Trees: Basic Terminology - Binary Trees - Binary Tree Representation - Binary Tree Traversal - Threaded Binary Trees – Binary Tree Representation of Trees-Application of Trees (**Seminar)** - Graphs: Basic Terminology - Representation of Graphs – Traversals, Connected Components and Spanning tree **(ICT)** - Shortest Path and Transitive Closure - Topological Sorting.

UNIT - III: Sorting Techniques (Inst Hrs: 12)

Internal and External Sorting – Searching-Insertion Sort – Quick Sort – 2-way merge sort - Heap Sort - Sorting on several keys - External Sorting: Storage devices **(Assignment)** - Sorting with Disks –Sorting with Tapes.

UNIT - IV: Development of Algorithms (Inst Hrs: 11)

Development of Algorithms - Basic Concepts, Structured Program Concepts - Top Down Development of Algorithms - Principle of Analyzing Algorithms - Algorithms Design Methods - Sub Goals and Hill Climbing.

UNIT - V: Algorithms Design Techniques (Inst Hrs: 10)

Divide and Conquer Algorithms **(ICT)** - Dynamic Programming - Greedy Algorithms - Backtracking and Branch & Bound Techniques.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Ellis Horowitz & Sartaj Sahni, "Fundamentals of Data Structures", Galgotia Pub.

Unit - I: Chapter 1, 2, 3, 4; Unit - II: Chapter 5, 6; Unit - III: Chapter 7, 8;

2. Ellis Horowitz & Sartaj Sahni, "Fundamentals of Computer Algorithms", Galgotia Publications.

Unit - IV: Chapter 1, 2, 3; Unit - V: Chapter 4, 5, 6.

REFERENCE BOOK (S):

1. Seymour Lipschutz,G.A Vijayalakshmi, "Data Structures" , TMH, 2008
2. Robert Lafore, "Data structures and Algorithms in Java", Pearson, 2nd Edition, 2011.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Able to develop the knowledge of basic data structure and C++
- Able to understand the concept of trees and graphs
- Able to provide a knowledge about sorting techniques
- Learn to analyze and compare algorithm for efficiency in searching
- Able to learn the different algorithm for design techniques

P1R1CACC3: DATABASE MANAGEMENT SYSTEM

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of database management system.
2. To understand the concept of relationship model.
3. To get the knowledge about relational model.
4. To understand the concept of structured query language.
5. To gain the knowledge about PL/SQL.

UNIT - I: Introduction to Database Management Systems (Inst Hrs: 10)

Introduction: Database Management System – Database System Applications - Database System versus File System - View of Data - Database Languages - Users and Administrators - Database System Structure - Application Architectures **(ICT)**.

UNIT - II: Entity Relationship Model (Inst Hrs: 10)

Basic concepts: Entity Sets – Relationship Sets – Constraints – Keys - Entity Relationship Diagram **(Seminar)** - Weak Entity Sets – Extended E-R Features: Specialization – Generalization - Attribute Inheritance – Constraints – Aggregation.

UNIT - III: RELATIONAL MODEL (Inst Hrs: 08)

Basic Structure – Relational Algebra: Fundamental Operations – Outer Join **(Assignment)**. Functional Dependencies: Basic Concepts – Closure - Closure of Attribute Sets – Decomposition – First Normal Form – Second Normal Form – Second Normal Form - Third Normal Form – Boyce-Codd Normal Form.

UNIT - IV: Structured Query Language (Inst Hrs: 08)

Basic Queries in SQL - Aggregate Functions **(ICT)** – Joins – Set Operations – Sub Queries - DML Commands - DDL Commands –Tables - Views.

UNIT - V: PL/SQL (Inst Hrs: 10)

Introduction - Advantages of PL/SQL – The Generic PL/ SQL Block – PL/SQL : Data types – Variables – Constants – Control Structures – Cursors – Exception Handling – Procedures and Functions - Packages – Triggers **(ICT)** – Types of Triggers.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. H. F. Korth & A. Silberschatz, "Database System Concepts", Tata McGraw Hill, New Delhi. 5th Edition, 2002.

Unit - I: Chapter 1; Unit - II: Chapter 6; Unit – III: Chapter 2, 7;

2. Ivan Bayross,"SQL, PL/SQL, The programming language of Oracle",BPB Publication, 3rd Edition,2009.

Unit - IV: section III Part - 1, 2, 3; Unit - V: section V- Part - 15, 16.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/dbms/

REFERENCE BOOK (S):

1. Elmasri & Navathe,"Fundamentals of Database systems", Addison & Weisely, Pearson Education, 2006.

2. C. J. Date, "An Introduction to Database Systems", Pearson Education, New Delhi, 8th Edition, 2006.

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the basics of database management system
- Understand the meaning and purpose of Entity Relationship model
- Improve the knowledge about relationship model concepts
- Understand the basic concept of Structured Query Language using various commands
- Use PL/SQL Commands with ease

P1R1CACC4: SHELL PROGRAMMING USING UNIX

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of UNIX.
2. To get the knowledge using the shell.
3. To understand the concept of shell programming.
4. To gain the knowledge about features of UNIX.
5. To understand the concept of program development and documentation.

UNIT- I: Introduction to UNIX (Inst Hrs: 12)

Files And Common Commands – More About Files: Directories – The Shell – The Rest of the UNIX system – Directories and File Names **(ICT)** – Permissions – Inodes – The Directory Hierarchy – Devices

UNIT- II: Using the Shell (Inst Hrs: 12)

Command Line Structure – Meta Characters – Creating New Commands – Commands Arguments And Parameters – Program Output As Arguments – Shell Variables **(Seminar)** – More on I/O Redirection – Looping in Shell Programming – Bundle: Putting it All Together . Filters – The grep Family – Other Filters – The Stream editor sed – The AWK Pattern Scanning and Processing Language **(ICT)** – Good Files and Good Filters.

UNIT- III: Shell programming (Inst Hrs: 12)

Customizing the cal command – While and Until loops: Watching for things **(Assignment)** – Traps: Catching interrupts – Replacing a file : Overwrite – Zap : Killing processes by name – The Pick command : blanks vs arguments – The news command : Community Service Messages – Get and put : Cracking the changes.

UNIT- IV: Features in UNIX (Inst Hrs: 11)

Standard input and output: Vis – Program arguments: Vis version 2 – File access : Vis version 3 – A screen at a timer printer : P – An example : Pick – On bugs and debugging – An example : Zap – An interactive file comparison program : idiff – Accessing the environment. Unix System Calls: Low-level I/O – File system: Directories – File system: Inodes – Processes – Signals and interrupts.

UNIT- V: Program Development and Documentations (Inst Hrs: 10)

Stage 1: A four-function calculator – Stage 2: Variables and error recovery – Stage 3: Arbitrary variable names; built-in functions - Stage 4: Compilation into a machine – Stage 5: Control flow and relational operators – Stage 6: Functions and procedures; input/output – Performance evaluation. Document Preparation: The ms macro package **(ICT)** – The troff level – The tbl and eqn preprocessors – The manual page – Other document preparation tools.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Brian W.Kernighan, Robe Pike,"The UNIX PROGRAMMING ENVIRONMENT", PHI Publications, 2008.

Unit - I: Chapter 1, 2; Unit - II: Chapters 3, 4; Unit – III: Chapter 5;
Unit - IV: Chapter 6, 7; Unit -V: Chapter 8, 9.

REFERENCE BOOK (S):

1. Harwani B.M., "Unix & Shell Programming", Oxford University Press,2015.
2. N.P. Gopalan & B. Sivaselvan,"A Beginner's Guide Unix",PHI,2009.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/unix/unix-getting-started.htm

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the basic concepts of UNIX
- Identify and analyze the knowledge of using SHELL
- Create Shell programming using UNIX
- Identify the features in UNIX using file system
- Conceptualize the program development and documentation

P1R1CACC5: OOAD AND UML

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of OOAD and UML.
2. To understand the concept of various object oriented methodologies.
3. To understand the concept of UML.
4. To understand the concept of object oriented analysis.
5. To understand the concept of object oriented design.

UNIT-I: Object Oriented System Development Basics (Inst Hrs: 12)

An Overview of object oriented systems development - Object basics: Object oriented Philosophy – Objects – Attributes - Object Behaviour and Methods - Encapsulation and Information Hiding - Class Hierarchy – Polymorphism **(ICT)** - Aggregation and Object Containment - Object Oriented System Development Life Cycle

UNIT-II: Object Oriented Methodologies (Inst Hrs: 12)

Object Oriented Methodologies - Rumbaugh et al.'s Object Modeling Technique - The Booch Methodology - The Jacobson's et.al. methodologies – Patterns **(Seminar)** – Frameworks - The Unified Approach.

UNIT-III: UML (Inst Hrs: 12)

Introduction - Static and Dynamic Model - Introduction to UML - UML diagrams **(Assignment)** - UML class diagram - Use-Case Diagram - UML dynamic modeling

UNIT-IV: Object Oriented Analysis (Inst Hrs: 11)

Object oriented analysis Process: Business Process modeling - Use case model - Developing Effective documentation - Object Classification **(ICT)** - Identifying Object Relationships, Attributes and Methods

UNIT- V: Object Oriented Design Process and Design Axioms (Inst Hrs: 10)

Object oriented design process – Design axioms – Corollaries - Designing Classes: The Object Oriented Design philosophy - Class visibility – Refining Attributes - Access layer - View layer.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Bahrami Ali, "Object Oriented System development", Irwin McGrawHill, 2005.

Unit - I: Chapter 1, 2, 3; Unit - II: Chapter 4; Unit - III: Chapter 5;

Unit - IV: Chapter 6, 7, 8; Unit - V: Chapter 9, 10, 11, 12.

REFERENCE BOOK (S):

1. Booch Grady, Rambaugh James, Jacobson Ivar, "The Unified Modeling Language – User Guide",Pearson Education,2006.

2. Roff Josan. T,"UML Beginners Guide", TMH, 2003.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/object_oriented_analysis_design/index.htm

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Analyze the basic concepts of OOAD and UML
- Improve the knowledge about various object oriented methodologies
- Understand the concepts of UML models using diagrams and their real world applications
- Identify and analyze the use cases, relationship, attributes and methods
- Develop the knowledge about object oriented design using different layers

P1R1CACC6P: SHELL PROGRAMMING USING UNIX PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 3**

Credit : 2 **Total Inst. Hrs: 36**

1. Write a shell program to some of the series

1/1! + 1/2! + 1/3! +……. +1/10!

2. Write a shell program which accepts the name of the file from, the standard input and then performs the following tests on it.

- File existence
- File readable
- File writable
- Both readable and writable.

3.Write a shell program using three argument to take the pattern as well as input and output file name , if the pattern is found display " pattern found " else display " error message " , also check right number of arguments are entered

4. Write a shell program which periodically monitors the disk for the existence of a file and then executes the program once file has been located [using UNTIL statement].

5. Write a shell program which accepts the name of a file from the standard input and then perform the following test on it.

- Enter the five names in a file
- Sort the name in existing file
- List unsorted and sorted file
- Quit.

6. Write a menu driven shell program to copy, edit, rename, and delete a file.

7. Write a menu driven shell program to perform the following task'

- Enter the sentence in file
- Search a given whole word in an existing file
- Quit

8. A hospital wants to maintain the patient detail by computing technique, write a shell program to get the list of,

- Patients in a given particular blood group.
- Patient in the age group of 20 yrs to 30 yrs.

9. Write a shell program to prepare electric bill for domestic consumers.

10. Write a menu driven shell program for the following

- List of files
- Process of users
- Today's date
- Users of system
- Quit from UNIX.

11. Write a shell program to reverse the sentence and find whether the given sentence is a palindrome or not?

12. Create an equivalent of a four-function calculator using UNIX.

P1R1CACC7P: DBMS PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 3**

Credit : 2 **Total Inst. Hrs: 36**

1. Creating, Updating and Inserting records into the database using simple queries.
2. Use of Select statement – for queries.
    a) AND, OR, NOT Operators, WHERE clause.
    b) UNION, INTERSECTION, MINUS
3. Sorting and Grouping.
4. Nested queries using SQL.
    a) Sub queries
    b) Join
5. Built-in-Functions of SQL
6. Use of Indexes creating views and querying in views.
7. Cursors, triggers and stored procedures and functions.
8. Using PL/SQL perform the following operations:
    a. Student evaluation systems.
    b. Payroll system.
    c. Income tax calculations.
    d. Seat reservation problems.
    e. Mark-Sheet preparation.

P2R1CACC8: DISTRIBUTED OPERATING SYSTEM

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of DOS.
2. To understand the concept of communication in distributed system.
3. To understand the concept of synchronization in distributed system.
4. To get knowledge about processors and processes in distributed system.
5. To gain the knowledge about distributed file system.

UNIT- I: Introduction to DOS (Inst Hrs: 12)

What is Distributed System – Goals – Advantages and Disadvantages of DOS – Hardware concepts – Multi computers – Software concept – Network Operating System – Multi - Purpose Time Sharing System – Design Issues **(ICT)** – Characteristics.

UNIT- II: Communication in Distributed System (Inst Hrs: 12)

Layered Protocols – Asynchronous Transfer Mode (ATM) Networks – ATM Switching – Client/Server model – Addressing **(Seminar)** – Group Communications.

UNIT- III: Synchronization in Distributed System (Inst Hrs: 12)

Clock Synchronization – Mutual Exclusion – Election Algorithm – Bully Algorithm – Ring Algorithm – Atomic Transactions: Transaction Model – Implementation – Concurrency – Control – Dead Lock In Distributed Systems: Detection and Prevention **(Assignment)**.

UNIT- IV: Processes and Processors in Distributed System (Inst Hrs: 11)

Threads – Introduction – Thread usage – Design issues for thread packages – Implementing a Thread Packages – System Models: The Workstation Model – Using Idle Workstation – The Processor Pool Model – Hybrid Model – Processor Allocation **(ICT)** – Fault Tolerance.

UNIT-V: Distributed File System (Inst Hrs: 10)

The File Service Interface – Directory Server Interface – Semantics of File Sharing – Distributed File System Implementation **(ICT)** – Trends – New Hardware – Scalability – WAN – Mobile Users – Distributed Shared Memory – Introduction – Shared Memory .

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Andrew S.Tanenbaum, "Distributed Operating System", Pearson Education, 2006

Unit – I: Chapter 1; Unit – II: Chapters 2.1, 2.2, 2.3, 2.5; Unit – III: Chapter 3; Unit – IV: Chapter 4 ; Unit –V: Chapter 5.1, 5.2, 6.2, 6.3, 6.4.

REFERENCE BOOK (S):

1. Pradeep.K & Singh**, "**Distributed Operating System Concept and Design", PHI Publications, 2006.

ONLINE RESOURCE(S):

1.http://ecomputernotes.com/fundamental/disk-operating-system/distributed-operating-system

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the concepts of DOS, characteristics and design issues
- Acquire knowledge on communication mechanism in distributed environment
- Know Synchronization in distributed system
- Understand the concept of thread
- Understand Distributed file system and memory concepts

P2R1CACC9: PROGRAMMING IN JAVA

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of Java.
2. To get the knowledge about class, objects, methods, exceptions and string.
3. To understand the concepts of inheritance and packages.
4. To get knowledge about multithreading, I/O and networking.
5. To gain the knowledge about applet, events and AWT components.

UNIT - I: An overview and Basic of Java (Inst Hrs: 12)

Creation of Java - Java and Internet - Java Buzzwords - OOPS - Simple Program - Lexical Issues - Data Types - Literals - Variables - Type Conversation and Casting - Arrays - Operators - Control Statements :Selection statements - Iteration Statements - Jump Statements**(ICT).**

UNIT - II: Class, Objects, Methods, Exception & String (Inst Hrs: 12)

Introducing Classes - Class Fundamentals - Declaring Objects - Introducing Methods - Constructors - This keyword - Garbage Collection- Finalize() Method - Exception Handling - Java's Built-in Exceptions - Creating Own Exception - String Handling **(Seminar)** - Special String operations - Modifying string .

UNIT - III: Inheritance and Packages (Inst Hrs: 12)

Inheritance Basics - Super Keyword - Multilevel Hierarchy- Constructors are called- Overriding - Abstract Classes and Methods - Final Keyword **(Assignment)** - Overloading - Parameters - Passing Arguments - Returning Object - Recursion - Access Control - Static – Nested and Inner Classes - String Class - Command Line Argument - Interfaces - Packages - Access Protection

UNIT - IV: Multithreading, I/O and Networking (Inst Hrs: 11)

Java Thread - Creating a Thread - Creating Multi Threads - I/O Basics - Reading and Writing Console I/O - Reading and Writing Files **(ICT)**- Stream Classes - Byte Streams - Character Streams - Stream I/O – Networking Classes and Interfaces.

UNIT - V: Applets, Events and AWT Components (Inst Hrs: 10)

Applet Class - Applet Basics - Applet skeleton - Applet Methods - Applet Tags - Parameters to Applet **(ICT)**-Event Handling - Event Classes - Event Listener Interface – Working with Graphics- AWT Controls , Layout Manager &, Menus : Control Fundamentals - Labels - Buttons - Check Boxes - Checkbox Group - Choice - List - Scroll Bars -Text Field - Text Area - Layout Managers - Menu Bars and Menus - Dialog Boxes - File Dialog .

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Herbert Schildt, "The Complete Reference Java2", Fifth Edition, 2007.

Unit - I: Chapter 1, 2, 3, 4, 5; Units - II: Chapter 6, 10, 13 ; Unit - III: Chapters 7, 8, 9; Unit - IV: Chapter 11, 12, 17, 18; Unit - V: Chapter 19, 20, 21, 22.

REFERENCE BOOK (S):

1. Dr.C.Muthu, "Essentials of Java Programming", Vijay Nicole Imprints Pvt Ltd., 5th Reprint 2009.

2. Royuttam. K, "Advanced Java Programming", Oxford University Press, 2015.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/java/

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Learn the basics of JAVA
- Get the knowledge about classes and objects
- Understand the concept of inheritance and package
- Get the knowledge about multithreading
- Gain the knowledge about applet ,event and AWT components

P2R1CACC10: OBJECT ORIENTED PROGRAMMING WITH C++

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of C++.
2. To get the knowledge about classes and arrays.
3. To understand the concept of overloading.
4. To get the knowledge about inheritance.
5. To understand the advanced I/O and virtual functions.

UNIT - I: An overview of C++ **(Inst Hrs: 12)**

Object Oriented Programming – C++ Console I/O - C++ Comments – Classes: Some Different between C and C++ - Introduction Function Overloading **(ICT)** – Constructor and Destructor Functions - Constructor take Parameters – Introducing Inheritance – Object Pointer – in line Functions – Automatic in lining.

UNIT - II: Classes & Arrays **(Inst Hrs: 12)**

Assigning Objects – Passing Objects to Functions – Returning Objects from Functions – An Introduction to Friend Functions – Arrays of Objects – Using Pointers to Objects – Using new & delete – More about new & delete **(ICT)**– Reference – Passing Reference to Objects –Returning references – Independent Reference and Restrictions.

UNIT - III: Overloading **(Inst Hrs: 12)**

Overloading Constructor Functions – Creating and Using a Copy Constructor – Using default arguments – Overloading and ambiguity – Finding the address of an overload functions – The Basic's of operator overloading - Overloading binary Operators - Overloading the relational and logical operators – Overloading a Unary operators **(Assignment)** – Using friend Operator Functions - A closer at the assignment operator - Overloading the subscript() operator.

UNIT - IV: Inheritance **(Inst Hrs: 11)**

Base class access control - Using protected members – Constructor , Destructors and Inheritance – Multiple Inheritance – Virtual Base Classes **(ICT)** - Some C++ I/O basics – Formatted I/O using Width(), Precision() and fill () - Using I/O Manipulators – Creating your own inserters - Creating Extractors.

UNIT - V: Advanced I/O & Virtual Functions **(Inst Hrs: 10)**

Creating your own manipulators – File I/O basics – Unformatted, Binary I/O- more unformatted I/O functions – Random Access - Checking the I/O status – Customized I/O and files – Pointers to derived classes - Introduction to virtual functions – More about virtual functions – applying polymorphism – Exception handling**(ICT)**.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Herbert Schildt, "Teach yourself C++", III edition, Tata McGraw Hill 7th Reprint 2001.

Unit – I: Chapter 1.1, 1.3 - 1.7, 2.1 - 2.4, 2.6, 2.7; Unit – II: Chapter 3, 4;

Unit – III: Chapter 5.1, 5.2, 5.4 - 5.6, 6; Unit – IV: Chapter 7, 8;

Unit – V: Chapter 9, 10, 11.3.

REFERENCE BOOK (S):

1. Robert Lafore, "Object Oriented Programming in Turbo C++",Galgotia Publications, 2001.
2. E.Balagurusamy "Object Oriented Programming with C++",TMH New Delhi, 2012.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/cplusplus/

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the concept of OOPS
- Understand Classes and Objects
- Understand Function Overloading
- Understand the Inheritance concepts
- Understand the Virtual Functions and Exception Handling

P2R1CACC11: DATA COMMUNICATION NETWORKS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of data and communication networks.
2. To understand the concept of OSI model.
3. To understand the concept of transmission media.
4. To get the knowledge about switching techniques.
5. To gain the knowledge about routing algorithms.

UNIT - I: Introduction **(Inst Hrs: 12)**

Networks – Protocols and Standard – Line Configuration – Topology **(ICT)** – Transmission Mode – Categories of Networks – Inter Networks.

UNIT - II: OSI Model **(Inst Hrs: 12)**

Functions of the layers – TCP/IP Protocol Suite – Signals – Analog and Digital Signal – Periodic and A-periodic Signals – Analog Signals **(Seminar)** – Digital Signal – Data Transmission – Data Terminal Equipment – Data Circuit terminals Equipment – Modems.

UNIT - III: Transmission Media **(Inst Hrs: 12)**

Guided media – Unguided Media **(Assignment)** – Transmission impairments – Media Comparis on. Multiplexing – FDM – TDM – WDM. Error Detection and correction – Types of Errors–Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) – Checksum – Error Correction.

UNIT - IV: Switching Techniques **(Inst Hrs: 11)**

Circuit switching – Packet Switching – Message Switching – Networking and Internetworking Devices – Repeaters – Bridges – Routers – Gateways **(ICT)**.

UNIT - V: Routing Algorithms **(Inst Hrs: 10)**

Distance Vector Routing – Link State Routing – Data Link Control – Line Discipline – Flow Control – Error Control**(ICT)**.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. William Stallings, "Data & Computer Communications", Sixth Edition, Pearson Education, 2001.

Unit – I: Chapter 1, 2; Unit - II: Chapter 3, 4, 5 ; Unit - III: Chapter 6, 7, 8; Unit - IV: Chapter 10, 11, 12, 13; Unit - V: Chapter 18, 19, 20.

REFERENCE BOOK (S):

1. Fred Halsall, "Data Communications, Computer Networks and Open Systems", Addison Wesley, 1995.

2. Mousavi & Massoud, "Data Communication and Networking A Practical Approach", Australia Cenage, 2012.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/data_communication_computer_network/

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Learn the basis of data and communication network
- Understand the concept of OSI model
- Get the knowledge about transmission media
- Get the knowledge about the switching techniques
- Learn the routing algorithms

P2R1CACC12P: PROGRAMMING IN JAVA PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Write a Java Program to Perform Arithmetic Operations In Switch Case

2. Preparing a Student Mark List Using Class And Objects

3. Write a Java Program to Display Matrix Using Array Concept

4. Write a Java Program to Implement The Concept Of Packages And Interface

5. Write a Java Program to Draw The Rectangle Using Polymorphism And Inheritance

6. Create a Try Block That Is Likely To Generate Two Types Of Exception And Incorporate Necessary Catch Blocks

7. Create a Java Program Using Multi-Threading Concept

8. Write a Program to Passing Parameter Using Applet

9. Write a Applet Program to Change The Background Color With The Help Of Three Button Named Red, Green, Blue

10. Draw the Rectangle, Oval and Circle Shapes Using Graphics Class

P2R1CACC13P: OBJECT ORIENTED PROGRAMMING WITH C++ PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Write a C++ program to find the largest list of prime numbers.
2. Write a C++ program to manipulate the file operations.
3. Write a C++ program to implement the virtual functions.
4. Write a C++ program to add two complex numbers using Operator Overloading.
5. Write a C++ Program to implement Sorting of Array of English Words in Dictionary order.
6. Write a C++ Program to implement Stack and its Operations Push and Pop.
7. Write a C++ Program to implement Queue and its Operations such as Front and Rear.
8. Write a C++ Program to implement Singly Linked List and its Operations such as insert, delete, print, navigate, and search.
9. Write a C++ Program to implement Sorting Operations on a Singly Linked List.
10. Write a C++ Program to implement Doubly Linked List and its Operations such as insert, delete, print, navigate, and search.
11. Write a C++ Program to implement Sorting Operations on a Doubly Linked List.

P3R1CACC14: COMPILER DESIGN

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of compiler design.
2. To get the knowledge about different types of parsing.
3. To understand the concept of intermediate code generation.
4. To gain the knowledge about code generation.
5. To understand the concept of optimization.

UNIT - I: Introduction **(Inst Hrs: 12)**

Compilers – Analysis of the source program – Phases of a Compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools- Lexical Analysis- Role of Lexical analyzer- Issues in Lexical analysis - Input Buffering **(ICT)** – Specification of Tokens.

UNIT - II: Different Types of Parsing **(Inst Hrs: 12)**

Role of Parser, Writing Grammars - Context-Free Grammars - Top Down parsing – Recursive Descent Parsing – Predictive parsing – Bottom-up parsing – Shift Reduce Parsing **(Seminar)** – Operator Precedent Parsing – LR Parser – SLR Parser.

UNIT - III: Intermediate Code Generation **(Inst Hrs: 12)**

Intermediate Languages –Types of three address Statement –Syntax – Directed Translation into three address code – Implementation of three address Statements – Declarations – Assignment Statements - Boolean Expressions – Methods of translating Boolean Expression – Case Statements – Back patching **(Assignment)** – Procedure calls.

UNIT - IV: Code Generation **(Inst Hrs: 11)**

Issues in the design of code generator – The target machine - Runtime storage management – Basic Blocks and Flow Graphs **(ICT)** – Transformation of Basic Blocks - A simple code Generator – DAG representation of Basic Blocks - Peephole optimization.

UNIT - V: Optimization **(Inst Hrs: 10)**

Introduction – Principles Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments **(ICT)** – Source Languages Issues - Storage Organization - Storage Allocation strategies – Access to non-local names - Parameters Passing.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Alfred Aho, Ravi Sethi, Jeffy D.Ullman, "Compilers- Principles , Tecniques and tools", Pearson Education Asia,2007.

Unit - I : Chapter 1, 3.1 - 3.3; Unit - II: Chapter 4.1 - 4.7;

Unit - III : Chapter 8.1 - 8.7; Unit - IV: Chapter 9.1 - 9.6 & 9.8, 10.3;

Unit - V : Chapter 10.1, 10.2, 10.4, 10.6, 7.

REFERENCE BOOK (S):

1. Mohan H. S., "Compiler Design", Narosa Publications, 2014.

2. Chattopadhyay & Shantanu, "Compiler Design", PHI Learning, 2013.

ONLINE RESOURCE (S):

1. https://www.geeksforgeeks.org/compiler-design-tutorials/

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the various phases of a compiler
- Know the role of parser
- Get Knowledge on intermediate code generation
- Gain knowledge on actual code generation
- Understand various code optimization issues

P3R1CACC15: J2EE TECHNOLOGIES

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of J2EE.
2. To understand the concept of presentation tier.
3. To understand the concept of the enterprise information system tier.
4. To gain the knowledge about service tier.
5. To gain the knowledge about data tier.

UNIT - I: Introduction (Inst Hrs: 12)

Understanding java and the J2EE platform - understanding J2SE - Examining the Origin of (J2EE) - Working with the Model-View-Controller **(ICT)** - Understanding J2EE API's -Introducing Application Servers - Implementing the J2EE Platform - Understanding the features of an Application server - Examining full J2EE Implementations - Examining partial J2EE Implementations - Avoiding vendor lock-in – Understanding RMI - Providing an Overview of RMI - Developing applications with RMI - Pushing data from the RMI server - RMI over Inter – ORB protocol(IIOP).

UNIT - II: The Presentation Tier (Inst Hrs: 12)

Creating a magazine publisher application using Servlet **(Seminar)** - Using the Servlet context-performing URL redirection - Examining the Web.xml deployment descriptor - Going over JSP basics - Introducing JSP - Examining MVC and JSP - JSP scripting elements and directives - Working with variable scopes – Error pages - Using Java Beans.

UNIT - III: The Enterprise Information System Tier (Inst Hrs: 12)

Working with Java Mail - Exploring the "Hello world" of Java Mail-understanding the protocols for Java Mail - Java Mail components - using the Java Mail API - integrating Java Mail into J2EE - Understanding the java messaging service - Explaining messaging-Introducing JMS - Examining messaging models - Understanding the major JMS components - Configuring JMS **(Assignment)**.

UNIT - IV: The Service Tier (Inst Hrs: 11)

Understanding EJB Architecture and Design **(ICT)** - Explaining the EJB component model -Reviewing roles, relationship and responsibilities - The Enterprise Java Beans - Understanding EJB Container Functionality - Integrating with CORBA - Performance and Scalability issues.

UNIT - V: The Data Tier **(Inst Hrs: 10)**

Introducing JDBC driver types - Creating your first JDBC program - Performing batch updates - Using save points - Configuring the JDBC **(ICT)** - ODBC Bridge - Explaining Database Connection pools and Data Sources – Revisiting – DBProcessor - Using the row set interface -Understanding the J2EEconnector Architecture - Examining the contracts - The Common Client Interface (CCI) - Packaging and Deployment.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. J2EE bible 1.4-McGovern et al., 2007.

Unit - I: Chapter 1, 3, 4; Unit - II: Chapter 5, 6 Unit - III: Chapter 8, 9; Unit - IV: Chapter: 14; Unit - V: Chapter 18, 19.

REFERENCE BOOK (S):

1. Kanda Dass & Rashmi, "J2EE Made Easy", Vikas Publications, 2014.
2. Kumar P.V., "J2EE Architecture An Illustrative Gateway to enterprise solution", TMH, 2007.

ONLINE RESOURCE (S):

1. http://www.actsinfo.biz/technologies/java-j2ee-technologies/

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the basics of J2EE
- Understand the concept of presentation tier
- Understand the concept of enterprise information system tier
- Understand the knowledge about service tier
- Understand the knowledge about data tier

P3R1CACC16: MANAGEMENT INFORMATION SYSTEMS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

- Upon successfully completing this course, a student will be able to do the following:
- Identify managerial challenges and opportunities for organizational advancement that may be resolved by the application of current new technologies.
- Identify opportunities for and successfully apply various information technologies to gain competitive advantage.
- Define and recognize key enabling technologies that may advance organizations now and in the future.
- Explain applications as groupware, the Internet, executive information systems, telecommunications, and other organizational support technologies and relate them to solving organization problems.
- Make required personal and organizational changes to implement the new technologies in established and in new organizations.
- Identify new opportunities and champion the introduction and application of advancing technologies in an organization.

Unit – I: Introduction of MIS (12hrs)

Introduction of MIS: Definition of MIS – Systems approach – meaning and objectives of MIS – MIS and use of computer – limitations of MIS.

Unit – II: Computer Software for information systems (12hrs)

Computer Software for information systems: introduction – system software – Application software – Software Trends.

Unit – III: Information system in Business (12hrs)

Information system in Business: introduction – Functional areas of Business – marketing information system – Human Resource Information System.

Unit – IV: Application of Information Technology in Business (12hrs)

Application of Information Technology in Business: Introduction of E-Commerce, Mobile Commerce, E-Governance, E-enterprises, From PC to the Web.

Unit – V: Information Security, Ethics and Society (12hrs)

Information Security, Ethics and Society: Challenges of Securing Computer systems – Types of Security Breaches, Cyber Laws and IT Act 2000 – Ethical and Social Dimensions of Information Technology.

Unit VI: Latest Learning (for Continuous Internal Assessment only):

Latest Developments Related to the course during the semester concerned.

(Theory: 75 marks)

Text Books:

1. Management, Information System A.K. Gupta – S. Chand and Company.
2. Management Information system Dr. S.P. Rajagopalan – Margham Publications, Chennai

Reference Books:

1. Management Information System P. Mohan – Himalaya Publishing House. Mumbai
2. Management Information System, Managerial Perspectives – D.P. Goyal – Macmilan.

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- ❖ Evaluate the role of information systems in today's competitive business environment.
- ❖ Identify and describe important features of organizations in order to build and use information systems successfully.
- ❖ Demonstrate systems analysis, design and decision making in a business setting.
- ❖ Define and describe the fundamentals of hardware, software, database management, data communications and systems related to the management activities of an organization.
- ❖ Assess how information systems support the activities of managers and end-users in organizations.
- ❖ Identify the principal management challenges posed by the ethical and social impact of information systems and management solutions

P3R1CACC17: DISCRETE MATHEMATICS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 5 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

- To study the basic concepts of Algebra
- To introduce a number of discrete mathematics structure found to be serving as tools even today in the development of theoretical Computer science
- To solve problems on Groups and Monoids
- To know the importance of discrete structures towards simulation of problems in computer science and engineering in near future
- To provide the knowledge of recurrence relations

UNIT I: Sets, Relations and Functions

Basic concepts of set theory – Some operations on Set. Partial ordering relations. Representation of discrete structure – Hasse diagram, functions, Inverse functions, Compositions of functions, Recursive functions

UNIT II: Mathematical Logic

Statement and notations – Connectives – Well formed, Logic operators, Truth tables - Tautology – Normal forms, Theory of inference and deduction, Mathematical calculus, Predicate calculus predicates and quantifiers

UNIT III: Groups and Subgroups

Algebraic Structure, Definition &Examples - General properties – Group Axioms, Permutation groups, subgroups, cosets, Lagrange's Theorem, Normal subgroups, semi groups, free semi groups and monoids – Definition and examples – Homomorphism of semi groups and Monoids

UNIT IV: Lattices and Boolean algebra

Lattices as a partial ordering sets – Definitions and Examples – Some properties of lattices – Lattices as algebraic systems, Sub Lattices – Discrete product and homomorphism – Some special Lattices – Boolean Algebra – Definition – sub algebra – Direct product and homomorphism – Boolean functions – Representation and minimization of Boolean functions – Karnaugh Map

Unit V: Recurrence Relations

Formulation - Solving by iteration method-Solving Recurrence Relations- Solving Linear Homogeneous Recurrence Relations of order two- Solving Linear Non - Homogeneous Recurrence Relations-Generating functions.

Unit –VI:

Latest development related to the course during the semester concerned. [For continuous CIA Assessment only]

Text Books:

[1] Tremly. J.P and Manohar.P., Discrete Mathematics Structures with Application to computer Science, MCGraw Hill, 1987.

[2] " Discrete Mathematics", N.Chandrasekaran and M.Umaparvathi, PHI Learning Private Limited, New Delhi, 2010.

Unit – I: Chapter II Section 2.1-2.6.1 [1]

Unit – II: Chapter I Section 1.1-1.4 except (1.4.4) [1]

Unit – III: Chapter III Section 3.1, 3.2 and 3.5 [1]

Unit – IV: Chapter IV Section 4.1 – 4.4 [1]

Unit – V: Chapter 6: Sec 6.1 to 6.6 [2]

Reference Books:

1) James C.Abboh, Sets, Lattices and Boolean algebra, Allya and Bacon Bortou, 1969.
2) G.S.S BhishmaRao, Discrete Structures and Graph theory, Scitech Publications pvt., Ltd.
3) C.L. Liu, Elements of Discrete Mathematics, Tata MCGraw Hill, 1987.

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the basic concepts of sets, Relations and functions
- Understand the logical arguments and logical constructs
- Understand groups, semigroups and monoids
- Appreciate the basic principles of Boolean algebra and lattices
- Understand recurrence relations and to find solution

P3R1CACC18P: J2EE TECHNOLOGIES PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Find the marks of the students using Remote Method Invocations.

2. Write a Servlet program to calculate the bonus of an employee

3. Write a Servlet program to implement Session Tracking.

4. Write a Servlet program to check authentication for user using Cookies.

5. Write a Servlet program and use JDBC in it.

6. Write a simple program for JSP.

7. Write a JSP program that works with JDBC.

8. Write a JSP Program with Bean Class.

9. Write an EJB Stateless Program to create bonus of an employee.

10. Write an EJB Stateless Program to prepare Mark Statement.

P3R1CACC19P: PHOTOSHOP AND FLASH PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

Photoshop

1. Develop an image using selection tools.

2. Develop an image using effects and apply filters and layers.

3. Develop an image with the help of clone stamp tool, smudge tool.

4. Create an e-invitation for college day.

5. Designing a student id card.

6. Designing multi-media profile about your university technology park.

7. Designing a cover page for the book in your subject area.

8. Designing a web banner.

Flash

9. Animate an image using motion, shape tweening, and actions.

10. Create an animation to represent the growing moon.

11. Create an animation to indicate a ball bouncing on steps.

12. Simulate movement of a cloud.

13. Animate a comic character.

14. Draw the fan blades and to give proper animation.

15. Create an animated cursor.

P4R1CACC20: MOBILE COMMUNICATION

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of mobile communication.
2. To understand the concept of telecommunication system.
3. To get the knowledge about wireless LAN.
4. To gain the knowledge about mobile network layer.
5. To understand the concept of wireless application protocol.

UNIT - I: Wireless Transmission (Inst Hrs:12)

Introduction : Application – A short history of wireless communication – A market for mobile communications – A Simplified Reference Model – Wireless Transmission – Multiplexing –Spread Spectrum – Cellular systems – Medium Access Control – SDMA – FDMA – TSMA – CDMA **(ICT)**- Comparison of S/T/F/CDMA.

UNIT - II: Telecommunications Systems (Inst Hrs: 12)

Telecommunications Systems :GSM – Mobile Services –System Architecture – Radio Interface – Protocols – Localization and Calling – Hand over and Security – UMTS and IMT 2000- Satellite System – History – Applications – Basics – GEO 193 – LEO 194 - MEO195- Routing – Localization – Handover – Examples **(Seminar)**.

UNIT - III: Wireless LAN (Inst Hrs: 12)

IEEE 802.11 - System architecture – Protocol Architecture – Physical Layer – Medium Access Control Layer – MAC Management-802.11b 251 802.11a254 - Newer Developments – HIPERRLAN – **Historical:** HIPERRLAN 1260 - WATM264 - BRAN275- HIPERRLAN 2 277 – Bluetooth **(Assignment)** - User scenarios - Architecture – Radio Layer 296 - Baseband Layer – Link manger protocol-L2CAP 305 - Security 307 - SDP 309 - Profiles 310 - IEEE 802.15 311.

UNIT - IV: Mobile Networks Layer (Inst Hrs: 11)

Mobile IP: Goals , assumptions and requirements - Entities and terminology – IP Packet Delivery - Agent Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – Mobile Adhoc Networks **(ICT)** - Routing – Destination Sequence Distance Vector - Dynamic source routing.

UNIT - V: Support for Mobility **(Inst Hrs: 10)**

World Wide Web - Hypertext Transfer Protocol - Hypertext Markup Languages - Wireless Applications Protocol (WAP) - Architecture – Wireless Datagram Protocol - Wireless Transport Layer Security- Wireless Session Protocol – Wireless Applications Environment – Wireless markup Languages - WML Script **(ICT)** - Wireless Telephony Applications.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 03)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Jochen Schiller, "Mobile Communication", Pearson Education, Delhi, 2000.

Unit - I: Chapter1, 2.1 - 2.5, 2.7, 2.8, 3.1 - 3.2, 3.3, 3.4, 3.5, 3.6;
Unit - II: Chapter 4 .1, 4.4, 5; Unit - III: Chapter 7.3, 7.4, 7.5;
Unit - IV: Chapter 8.1, 8.3; Unit - V: Chapter 10.2, 10.3.

REFERENCE BOOK (S):

1. The Wireless Application Protocol: Writing Application for the Mobile Internet", Sandeep Singhal, et al., Pearson Publications, 2007.

ONLINE RESOURCE (S):

1. https://www.javatpoint.com/mobile-communication-introduction

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Have knowledge on simplified reference model
- Have knowledge on satellite system and security
- Have knowledge on various standards in mobile communications
- Have knowledge on ip packet delivery & routing
- Have knowledge on supporting technologies wad, http, wml script

P4R1CACC21: .NET TECHNOLOGIES

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 4 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

1. To understand the basics of .NET.
2. To understand the concepts of objects and namespaces.
3. To understand the concept of web from fundamentals.
4. To understand the concept of error handling.
5. To understand the concept of data controls.

UNIT - I: Introducing .NET (Inst Hrs: 12)

The Evolution of Web Development – HTML and HTML Forms, Server-Side Programming, Client-Side Programming. The .NET Framework- C#, VB, and the .NET Languages, The Common Language Runtime, The .NET Class Library. The C# Language: C# Language Basics – Variables and Data Types – Variable Operations – Object-Based Manipulation - Conditional Logic – Loops **(ICT)** – Methods.

UNIT - II: Types, Objects, and Namespaces (Inst Hrs: 12)

The Basics About Classes – Static Members, A Simple Class. Building a Basic Class – Creating an Object, Adding Properties, Automatic Properties, Adding a Method, Adding a Constructor, Adding an Event **(Seminar)**. Value Types and Reference Types –Understanding Namespaces and Assemblies – Advanced Class Programming. Developing ASP.NET Applications: The Promise of Visual Studio – Creating Websites – Designing a Web Page – The Anatomy of a Web Form – Writing Code – Visual Studio Debugging.

UNIT - III: Web Form Fundamentals (Inst Hrs: 12)

The Anatomy of an ASP.NET Application – Introducing Server Controls – HTML Server Controls, Converting an HTML Page to an ASP.NET Page, View State, The HTML Control Classes, Event Handling, Error Handling. The Page Class – Application Events – ASP.NET Configuration. Web Controls: Stepping Up to Web Controls –Web Control Classes – List Controls – Table Controls – Web Control Events and Auto Post Back – A Simple Web Page **(Assignment).**

UNIT - IV: Error Handling (Inst Hrs: 11)

Exception Handling – Handling Exceptions - State Management: The Problem of State – View State – Transferring Information Between Pages – Cookies – Session State – Session State Configuration – Application State. Validation: Understanding Validation – The Validation Controls - Rich Controls: The Calendar – The Ad Rotator – Pages with Multiple Views **(ICT)**. ADO.NET Fundamentals: Understanding Databases – Configuring Your

Database –SQL Basics – The Data Provider – Direct Data Access – Disconnected Data Access.

UNIT - V: The Data Controls (Inst Hrs: 10)

The Grid View – Formatting the Grid View **(ICT)** – Selecting a Grid View Row – Editing with the Grid View – Sorting and Paging the Grid View – The Details View and Form View. XML: XML Explained – The XML Classes – XML Validation – XML Display and Transforms.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 03)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Mathew MacDonald, "Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional", Apress Publications, Second edition, 2007

REFERENCE BOOK (S):

1. Mirudula Parihar,"ASP.NET Bible", DreamTech Publication, 2007.
2. Buzek & Grieg, "ASP.NET Developers Guide", TMH, 2008.

ONLINE RESOURCE (S):

1. http://ecomputernotes.com/csharp/dotnet/dot-net

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Learn C# language basics, and its framework
- Learn the concept of objects and namespace
- Design and Develop simple web page using web form
- Understand the error handling mechanism
- Project the outcomes of the web applications using various views

P4R1CACC22: ACCOUNTING FOR MANAGERS

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To familiarize the students with basic knowledge of accountancy and accounts related to finance and management.
2. To understand about the concept of management accounting and analysis of financial statements.
3. To indulge in various ratios to take decision and proficiency in marginal costing technique.
4. To habituate the preparation of budgets by following budgetary control techniques

Unit - I: Accounting concepts (Hours: 08)

Accounting principles and concepts –Double entry book keeping-income and expenditure – Accounting records and system-Assets and liabilities, depreciation.

Unit - II: Final Accounts (Hours: 09)

Journal- Ledger-Trial balance-Trading-Manufacturing –Profit and loss accounts and balance sheet.

Unit - III: Management Accounting (Hours: 09)

Definition of management accounting –nature-scope-objectives-merits-limitations-difference between management accounting and financial accounting-financial statement analysis-internal and External analysis, Vertical and horizontal analysis.

Unit - IV: Financial Statement Analysis (Hours: 12)

Analysis and interpretation of financial statement -comparative income statement –common size income statement-trend analysis, Ratio analysis

Unit -V: Budget and Budgetary Control (Hours: 10)

Budgeting and budgetary control – Types of budget- Preparation of various functional budgets, preparation of cash budget and flexible budget- Advantages of budgetary control.

Unit VI Latest Learning (for Continuous Internal Assessment only):

Latest Developments Related to the course during the semester concerned.

(Theory 25 Marks Problem 50 Marks)

Text Book:

1. Financial Accounting- Dr. Radha, Prasanna Publication. Chennai
2. Management Accounting – Murthy and S. Gurusamy. Vijay Nicole Imprints Pvt.Ltd. Chennai

Reference Books:

1. Management Accounting – R.S.N.Pillai and Bhagavathy, Sultan Chand Publication.NewDelhi
2. Financial Accounting- T.S.Reddy and Murthy, Margham Publications, Chennai

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

1. Understand about the concept of management accounting, and different methods of analysis of financial statements.
2. Elicit knowledge on various types of ratio analysis techniques and analyzing the cost volume and break even analysis in Marginal costing.
3. Proficiency in preparation of different types of budgets like sales budget, Cash budget and flexible budget etc.

P4R1CACC23: PROBABILITY AND STATISTICS

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 5 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

- To apply probability theory via Baye's rule
- To use method of moments and moments generating function
- To Learn the Additive properties of Normal Distribution
- To known the most widely used t-distribution
- To interpret the procedure for testing of hypothesis

Unit I: Theory of Probability

Probability – Random Experiment - Addition theorem – Conditional Probability – Multiplications Theorem- Baye's theorem – Random Variables and their Properties – Discrete and Continuous Random Variables

Unit II: Discrete Probability Distributions

Binomial, Poisson and their properties – Definition, Mean, Variance, Moment Generating Functions, Additive Properties.

Unit III: Continuous Probability Distributions

Normal, Uniform distributions – Definition, Mean, Variance, Moment Generating Functions, Additive Properties.

Unit IV: Tests of Significance for Small Samples

Introduction – Derivation of Chi – Square Distribution – Applications of chi – square Distribution – Student's 't' Distribution – Applications for 't' Distribution – t – Test for single mean , t – Test for difference of means.

Unit V: Tests of Significance for Large Samples

Introduction – Types of Sampling – Parameter and Static – Test of significance – Procedure for testing of Hypothesis – Sampling.

Unit –VI:

Latest development related to the course during the semester concerned. [For continuous CIA Assessment only]

Text Books:

[1] "**Probability, Statistics and Random Processes**", T. Veerarajan, Tata McGraw Hill (2009)

[2] **"Fundamentals of Mathematical Statistics**" - S.C.Gupta, V.K.Kapoor - Sultan Chand & Sons - New Delhi (1995).

Unit I: Chapter 1, Pg. No. 1-20, [1]

Chapter 2, Pg. No. 33- 49 [1]

Unit II: Chapter 5, Pg. No. 208- 214, 219-233[1]

Unit III: Chapter 5, Pg. No. 239-241, 246 – 278 [1]

Unit IV: Chapter 15, Sec 15.1, 15.2, 15.6 – 15.6.3, Chapter 16, Sec 16.1, 16.2.1, 16.3 – 16.3.1,16.3.2 [2]

Unit V: Chapter 14, Sec 14.1-14.8(except 14.8.5) [2]

Reference Books:

[1] "**Mathematical Statistics"** - J.N. Kapur, H.C.Saxena - S.Chand& Company Ltd - New Delhi (2011)

[2] **"Introduction to Biostatistics**" – Sokaland Rohlf – Toppan Co. Japan

[3] "**Statistical and Numerical Methods**", by P.R. Vittal and V. Malini, Margham Publications

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Prove some basic theorems on probability theory
- Understand the concept that poisson distribution is limiting case of binomial distribution
- Know the most widely used probability distribution and recognize them in applications
- Develop skills to apply chi-square distribution
- Demonstrate a solid understanding of interval estimation and hypothesis testing

P4R1CACC24P: MOBILE COMPUTING PRACTICAL

Max Marks : 40+60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Design a different Layout design including nested layout for a single bio-data.

2. Design of simple Calculator.

3. Design of Calendar for any given month and year

4. Design a Timer to System Time.

5. Design of simple game.

6. Animation: Bouncing of a ball.

7. Animate an image.

8. Design a personal phone book containing the name, phone no., address, e-mail, etc.

9. Simulation of Authentication and encryption technique used in GSM.

10. Browsing the Internet using Mobile phone simulator

P4R1CACC25P: .NET TECHNOLOGIES PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Write C# windows application for currency conversion.

2. Write C# windows application for calculator with some scientific function.

3. Design website for online entrance examination registration form.

4. Create a job search portal by using web controls.

5. Design ASP.Net login page for website with Session and cookies.

6. Create the webpage to validate E-Mail registration.

7. Design a web page that makes uses of Ad Rotator Control.

8. Design a web page involving Multi View Control.

9. Create a MSSQL table and execute queries to read, add, remove and modify a record from that table.

10. Design website for your college department.

P4R1CAPS2: SOFT SKILL DEVELOPMENT COURSE

Max Marks : 25 + 75 = 100 **Hrs / Week : 02**

Credit : 2 **Total Inst. Hrs: 24**

COURSE OBJECTIVES:

1. To get the idea about soft skill development.
2. To get the knowledge about error correction.
3. To gain the knowledge of proficiency in English.
4. To get the idea about group discussion, interview and presentation skills.
5. To understand the concepts of percentage and its application, inverse variation, arithmetic progression.

UNIT - I: Reading Comprehension (Inst Hrs: 05)

Reading Comprehension - Read The Following Passage And Answer The Question Given Below - Comprehension Test Can Be Given In Different Ways - Method I, Method II, Method III , Method IV - Read The Following Passages And Answer The Questions That Follow - Fill In The Gaps With Suitable Words from the list. **(ICT)**

UNIT - II: Error Correction (Inst Hrs: 05)

Error Correction – Choose The Most Appropriate Answer - Correct The Following Sentences - Choose The Correct Answer - Identify The Part Which Contains An Error. If There Is No Error Write 'D'- Choose The Correct Answer - Correct The Following Sentences - Identify The Part Which Contains An Error. If There Is No Error Write 'E' - Identify Where An Error Is Present In The Given Sentences. **(Seminar)**

UNIT - III: Proficiency in English (Inst Hrs: 04)

Proficiency in English - I. (A) Prefixes [Skills: Willingness to Practice] - Practicing Prefixes Meaning Note:-I. (B) Prefixes-Numeric's [Skills: Aptitude For Numbers] - II .(A) Suffixes - II .(B) When The Suffix Ness Is Added To Adjectives Ending In N The Resulting Noun Has Of Course A Double N-Even If "It Looks Wrong" - III. Try These Roots [Skills: A Drive To Tyr] - IV. Plural Problems [Skills: Grammar, Reading] - V. Stress In Spelling [Skills: Common Sense] VI. Spell Intelligently [Skills: Basic Spelling and Grammar] - VII. Some Homophones [Skills: Grammar, Knowing Regulations] - VIII. Quote, Apostrophize [Skills: Grammar, Rule] - IX. Noun, Adjective, Verb [Skills: Awareness Of How Rules Work] - X. No Confusion, Please [Skills: Clear Apprehension] - XI. Mistakes Beware [Skills: Alertness] - XII. Correct the Fault [Skills: Self-Direction]. **(Assignment)**

UNIT - IV: Group Discussion and Interview, Presentation Skills (Inst Hrs: 04)

Group Discussion - Topics For Group Discussion – Interview – Preparation – Appearance **(ICT)** – Punctuality - Handling Of The Opening Moments – Speech - Be Honest And Bold - Some Possible Questions - Exercise - Chapter-VI: Presentation Skills-Punctuality-Handling Of The Opening Moments-Speech-Be Honest And Bold-Some Possible Questions-

Preparing The Introduction Of The Presentation-Preparing The Body Of The Presentation-Check Understanding - Handling Interruptions - Preparing The Conclusion Of The Presentation - Summary/Conclusion - Cue Cards - Overhead Projector – Whiteboard – Computer - Based Presentation - Handouts

UNIT - V: Percentage and its Applications, Direct and Inverse Variation, Arithmetic Progression. (Inst Hrs: 04)

Percentage And Its Applications – Introduction - Some Problems On Percentage - Profit And Loss - Simple Interest - Direct And Inverse Variations – Introduction - Direct Variation - Inverse Variation - Time And Work, Time And Distance **(ICT)**-Arithmetic Progressions – Introduction - Arithmetic Progressions - The N^{th} term Of An Arithmetic Progression - Sum Of A Finite Number Of Terms Of An Arithmetic Progression

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. K.Meena & V.Ayothi, "A book on Development of Soft Skills"- (Full Book), PR Publisher and Distributors, 2012.

REFERENCE BOOK (S):

1. I Jayakaran, "English Companion for All Competitive Examinations",2M Publishing International.

2. Hari Mohan Prasad & Uma Rani Sinha, "Objective English for Competitive Examinations", Third Edition ,The McGraw-Hill Companies.

3. V.Shymala, "Effective English Communication for You", Emerald Publishers.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/soft_skill_tutorials.htm

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Know how to read comprehensions
- Know how to correct errors
- Become proficiency in English
- Know how to participate in group discussion
- Understand Arithmetic Progression

P5R1CACC26: DATAMINING AND WAREHOUSING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of data mining and warehousing.
2. To understand the concept of cluster analysis.
3. To gain the knowledge about web data mining and search engines.
4. To get the knowledge about data warehousing.
5. To understand the concept of online analytical processing and information privacy.

UNIT- I: Association Rules Mining (Inst Hrs: 10)

Introduction to Data mining – Association Rule Mining – The Apriori Algorithm **(ICT)** – Improving the efficiency of Apriori algorithm – Apriori-Tid – Direct Hashing and Pruning(DHP) – Dynamic Itemset Counting (DIC) – Performance Evaluation of algorithms – Software for Association Rule Mining.

UNIT- II: Cluster Analysis (Inst Hrs: 10)

Classification – cluster analysis – Desired features of Cluster analysis – Types of Data- Computing Distance – Types of cluster analysis methods **(Seminar)** – Partitional methods – Hierarchical methods – Density based methods – Dealing with large database – Quality and validity of cluster analysis methods – Cluster analysis software.

UNIT- III: Web Data Mining and search Engines (Inst Hrs: 10)

Web data mining – Web terminology and characteristics **(Assignment)** – Locality and hierarchy in the web –Web content mining – Web usage mining – Web structure mining – Search Engines – Characteristics of Search Engines – Search Engine Functionality – Search Engine architecture – Ranking of Web pages **(ICT)** – The search engine industry – Enterprise search engine software.

UNIT- IV: Data Warehousing (Inst Hrs: 08)

Data warehousing – Introduction – Operational Data stores – ETL – Data warehouses – Data warehouse design – Guidelines for data warehouse implementation – Data warehouse – Metadata – Algorithms & Operations to create data warehouse – designing data warehouse – Application of Data warehouse **(ICT).**

UNIT- V: Online analytical processing and Information Privacy (Inst Hrs: 08)

Online analytical processing – OLAP – Characteristics of OLAP systems – Motivation for using OLAP – Multidimensional View and /data Cube – Data cube Implementations – Information privacy – What is Information privacy? – Basic principles of Protect Information privacy – Uses and Misuses of Data Mining – Primary Aims of Data Mining Pitfalls of Data Mining – Technological Solutions.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. G.K.Gupta, "Introduction to Data Mining with case studies", Prentice Hall India, 2006.

   Unit - I: Chapter 1, 2; Unit - II: Chapter 3, 4; Unit - III: Chapter 5, 6; Unit - IV: Chapter 7; Unit - V: Chapter 8, 9.

REFERENCE BOOK (S):

1. Sharam Nitu,"DataWareHouse and Data Mining", Global Academic Publications,2013.

2. Naga Bhushana. S, "Data WareHousing OLAP & Data Mining", New age International Publications, 2016.

ONLINE RESOURCE (S):

1. https://www.guru99.com/data-mining-vs-data-warehouse.html

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the concept of Data mining and the association rule mining
- Understand Various algorithm of classification and clustering methods
- Excel in web data mining
- Knowledge on data ware housing
- Acquire basic principles of information privacy

P5R1CACC27: NETWORK SECURITY

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of network security.
2. To get the knowledge about public-key encryption and hash functions.
3. To get the knowledge about network security applications.
4. To gain the knowledge about IP security.
5. To understand the concept of system security.

UNIT - I: Symmetric Ciphers (Inst Hrs: 10)

Introduction: Security Trends – The OSI Security Architecture – Security Attacks – Security Services – Security Mechanisms – A Model for Network Security – Symmetric Ciphers: Classical Encryption Techniques **(ICT)** – Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Rotor Machines – Steganography.

UNIT - II: Public-key Encryption and Hash Functions (Inst Hrs: 10)

Symmetric Ciphers: Block Ciphers and The Data Encryption Standards – Block Cipher Principles – The Data Encryption Standard **(Seminar)** – The Strength of DES – Differential and Linear Cryptanalysis – Block Cipher Design Principles – Public-key Encryption and Hash Functions: Public-key Cryptography and RSA – Principles of Public-key Cryptosystems – The RSA Algorithm.

UNIT - III: Network Security Applications (Inst Hrs: 10)

Network Security Practices: Authentication Applications: Kerberos – X.509 Authentication Service – Public-key Infrastructure – Electronic Mail Security **(Assignment)** – Pretty Good Privacy – S/MIME.

UNIT - IV: IP Security (Inst Hrs: 08)

Network Security Practices : IP Security Overview – IP Security Architecture – Authentication Header – Encapsulating Security Payload – Combining Security Associations – Key Management – Web Security: Web Security Considerations **(ICT)** – Secure Socket Layer and Transport Layer Security – Secure Electronic Transaction.

UNIT - V: System Security (Inst Hrs: 08)

Intruders – Intrusion Detection – Password Management – Malicious Software: Viruses and Related Threats – Virus Countermeasures – Distributed Denial of Service Attacks – Firewalls: Firewall Design Principles **(ICT)** – Trusted Systems – Common Criteria for Information Technology Security Evaluation.

UNIT - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. William Stallings, "Cryptography and Network Security Principles and Practices", Prentice-Hall, Third Edition, 2003.

Unit I: Chapter 1, 2; Unit - II: Chapter 3, 9; Unit - III: Chapter 14, 15;

Unit - IV: Chapter 16, 17; Unit - V: Chapter 18, 19, 20.

REFERENCE BOOK (S):

1. Johannes A.Buchaman , "Introduction to Cryptography", Springer – Verlag 2000.
2. Atul Kahate, "Cryptography and Network Security", Tata McGraw Hill.2007.

ONLINE RESOURCE (S):

1.https://www.tutorialspoint.com/information_security_cyber_law/network_security.htm

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Gain the knowledge about the basic components and principles of cryptography
- Gain the knowledge to design their own cryptographic algorithm
- Learn the knowledge of network security in different and dynamic environment
- Obtain the knowledge to classify the threats and can design their own database of threats to avoid the VIRUS
- Get the job as network security professionals

P5R1CACC28: PHP AND MYSQL

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of PHP and MYSQL.
2. To understand the concept of arrays and objects.
3. To gain the knowledge about getting involved with the code.
4. To understand the concept of learning MYSQL.
5. To understand the concept of MYSQL functions.

UNIT I: PHP Language structure (Inst Hrs: 10)

The building block of PHP: Variables - Data types – Operators and Expressions- Constants. Flow Control Functions in PHP: Switching statements - Looping statements. Working with Functions: Calling function - Defining a Function - Return values from user defined functions **(ICT)** - Variable Scope - Static statement - More about arguments.

UNIT II: Arrays and Objects (Inst Hrs: 10)

Working with Arrays: Define Array - Types of arrays - Array related functions **(Seminar)**. Working with Classes and Objects: Creating an object - object inheritance. Working with Strings, Dates, Times: Formatting strings with PHP - Investigating strings in PHP - Manipulating string with PHP - Date functions - Time functions.

UNIT III: Getting involved with the code (Inst Hrs: 10)

Working with Forms: Creating and accessing input forms –using hidden fields to save state-redirecting the user- working with file uploads. Working with Cookies and Session: Setting cookie with PHP- starting a session-creating session variable. Working with Files and Directories: Include () - validating files - Creating and Deleting files **(Assignment)** - Directories function.

UNIT - IV: LEARNING MySQL (Inst Hrs: 08)

Understanding the Database Design Process: The importance of good database design - Types of Table Relationships - Understanding Normalization and Database Design Process. Learning Basic SQL Queries: Data types in MySQL-table creation-insert, select, where, update, replace, and delete commands **(ICT)**.

UNIT - V: MySQL FUNCTIONS **(Inst Hrs: 08)**

String functions in MySQL - Using Date functions - Using Time functions - Using Transactions - Using stored procedures – MySQL with MySQLi functions **(ICT)**. Interaction with MySQL using PHP: Connecting to MySQL - Working with MySQL data - Working with XML - Sample projects using PHP and MySQL.

UNIT - VI: Latest Learning (For CIA only): **(Inst Hrs: 02)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Julie C.Metoni ,"Sams Teach Yourself PHP, MySQL, Apache", Pearson,2007

Unit - I: Chapter 5, 6, 7; Unit - II: Chapter 8, 9, 10; Unit - III: Chapter 11, 12, 13; Unit - IV: Chapter 15, 16; Unit - V: Chapter 17, 18.

REFERENCE BOOK (S):

1. Vikram Vaswani,"PHP Programming solutions",.TMH, 2007
2. Tim Converse, Joyce Park," PHP5 and MYSQL Bible"

ONLINE RESOURCE (S):

1. https://www.w3schools.com/php/default.asp

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand the basics of PHP and MYSQL
- Understand the concepts of Arrays and objects
- Gain the knowledge about coding
- Understand the concept of MYSQL
- Acquire the knowledge about MYSQL functions

P5R1CACC29: MARKETING MANAGEMENT

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To endow students with the knowledge of marketing
2. To understand the importance of consumer behavior
3. Able to identify and use source of marketing research information
4. To understand good marketing practices
5. Able to develop a sound integrated marketing communication plans

Unit - I: INTRODUCTION (Hours: 08)

Definition –meaning of marketing and marketing management – scope – nature and importance of marketing management – functions – problems – principles of marketing management – marketing mix and strategic marketing planning process – marketing organization structure

Unit - II: PRODUCT (Hours: 10)

Product development – new product planning and development – steps in new product planning and development – product life cycle – product line and product mix decisions – pricing – objectives of pricing decision – factors influencing pricing decision – process of price determination – kinds of pricing – consumer adoption process

Unit – III: CHANNELS OF DISTRIBUTION (Hours: 10)

Meaning – basic channels of distribution – selection of a suitable channel – factors influencing selection of a channel – middlemen – kinds – functions and elimination of middlemen – argument in favour of and against middlemen – management of marketing channels – online marketing

Unit - IV: SALES PROMOTION (Hours: 10)

Sales promotion – meaning and definition – objectives and importance of sales promotion – sales promotional activities – types of sales promotion programmes – salesmanship – essentials – steps in selling – personal selling – sales organization –

salesmanship qualities – exhibition, trade fairs, fashion shows – marketing communication process

Unit - V: ADVERTISING (Hours: 10)

Meaning and definition of advertising – advertising and publicity – objectives of advertising – advertising media – advertising copy – qualities of good advertisement – effectiveness of advertising – factors governing selection of media – role of advertising agency – benefits of service agencies.

Unit - VI: Latest Learning (for Continuous Internal Assessment only):

Latest Developments Related to the course during the semester concerned.

(Theory 75 Marks)

Text books:

1. Marketing management – Dr.Radha , Prasanna Publishers, 2010.
2. Marketing – Rajan Nair, S. Chand publications, NewDelhi, 2013

Reference books:

1. Marketing – J.Jayansankar, Margham Publications, Chennai
2. Marketing Management – S.A.Sherlekar, Himalaya Publishing House.
3. Marketing Management – R.S.N.Pillai and Bagavathi, Sultan Chand and sons, New Delhi.
4. Marketing Management – PhilpKotler, PHI, New Delhi

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Understand of nuances of marketing as a subject and its various elements of marketing mix that influence the organization.
- Comprehend the knowledge about product life cycle and new product planning process.
- Enhance assessment of price and how that influences the cost of the product.

Describe about various promotion techniques that help to increase the sales of the product.

P5R1CACC30: OPTIMIZATION TECHNIQUES

Max Marks : 25 + 75 = 100 **Hrs / Week : 05**

Credit : 5 **Total Inst. Hrs: 60**

COURSE OBJECTIVES:

- To describe the need and importance of operations research
- To discuss the basic concepts and techniques for solving replacement problem
- To maintain the balance between inventories
- To maximize the utility of limited resources
- To analyse the simulation of Inventories problems

Unit I: Linear Programming Problem

Introduction – origin and development of OR – Nature and Features of OR – Scientific Method of OR – Modeling in OR – Operations Research and Decision Making – Applications of OR - Linear Programming Problem - Mathematical Formulation of the problem - Graphical Solution - General LPP - Canonical and standard forms of LPP–Simplex method - Use of Artificial variables - Big M method .

Unit II: Replacement Problems

Introduction - Replacement of Equipments / Asset that Deteriorates Gradually - Replacement of equipment that fails suddenly

Unit III: Inventory Control

Introduction – Types of Inventories – Reasons for carrying Inventories – The Inventory Decisions – Objectives of scientific Inventory control – Cost associated with Inventories – Factors affecting Inventory control – An Inventory control problem – The concept of EOQ - Deterministic inventory problems with no shortages - Deterministic inventory problems with shortages– Problems of EOQ with Price Breaks

Unit IV: Queueing Theory

Introduction - Queueing system –Elements of a Queueing system – Operating characteristics of a Queueing system – Deterministic Queueing system – Probability distributions in Queueing systems - Classifications of queueing models –Definition of Transient and Steady states – Poisson Queueing systems (Model I – IV only)

UNIT V: Simulation

Introduction – Why Simulation? – Process of Simulation – Simulation Models – Event – Type Simulation – Generation of Random Numbers - Monte Carlo method – Simulation of Inventory Problems - Simulation of a Queueing System - Simulation of Maintenance Problems - Simulation of Investment and Budgeting - Simulation of Jobs sequencing - Simulation of Networks - Advantages and disadvantages of Simulation

Unit –VI:

Latest development related to the course during the semester concerned. [For continuous CIA Assessment only]

Text Book:

[1] KantiSwarup, Gupta and Manmohan: "Operations Research". Sultan Chand & sons, New Delhi

Unit I: Chapter 1 sec: 1.1 to 1.5, 1.9, 1.10, Chapter 2 sec: 2.1 to 2.3

Chapter 3 sec: 3.1 to 3.5 and Chapter 4, sec: 4.1 to 4.4

Unit II: Chapter 18, sec: 18.1 to 18.3

Unit III: Chapter 19, 19.1 to19.12

Unit IV: Chapter 21, 21.1 to 21.9, (Model I to Model IV)

Unit V: Chapter 22, Sec: 22.1 to 22.14

Reference Books:

1) **Operations Research** -HamdyA.Taha - Prentice Hall of India, New Delhi.
2) **Operations Research and Quantitative analysis** - P.K. GuptadD.S.Hira - Schand& Company Ltd - New Delhi.
3) **Operations Research Methods and Application** -P.Marriappan - New Century Book House Pvt. Ltd.

COURSE OUTCOMES:

After the successful completion of the Course the Students shall be able to,

- Apply knowledge of optimization to formulate and solve engineering problems
- Understand the different methods of optimization and be able to technique for a specific problem
- Learn the cost function of Inventory system
- Acquire the knowledge of Poisson Queuing System
- Understand the concept of Simulation of Networks

P5R1CACC31P: NETWORK SECURITY PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Write a networking program in Java to implement a TCP server that provides services for a TCP Client.
2. Write a networking program to implement socket programming using user datagram Protocol in Java.
3. Implement an FTP server using socket programming.
4. Implement a chat server using socket programming.
5. Implement an ECHO server using socket programming.
6. Implement Address Resolution Protocol using socket programming.
7. Implement Ping server and Ping client using socket programming.
8. Implement Single Window Protocol.
9. Implement Remote Command Execution using network programming.
10. Using Remote Method Invocation distribute the processing to three nodes.
11. Implement a program to retrieve the data for the specified URL.
12. Write a Java program to check whether the given DNS is found in the internet or not.
13. Write a program to implement multicasting.
14. Write a network program using HTTP to print the document for the given URL.

P5R1CACC32P: PHP AND MYSQL PRACTICAL

Max Marks : 40 + 60 = 100 **Hrs / Week : 03**

Credit : 2 **Total Inst. Hrs: 36**

1. Write a PHP program to create Student Mark Statement.
2. Write a PHP Program to create Employee pay roll preparation.
3. Write a PHP program to use three buttons and change the Background color.
4. Write a PHP program to format the given text.

   Bold

   Italic

   Underline

   Increase the font size

   Change the font color.
5. To develop a PHP program for multiply 5 sessions variables.
6. Display student Resume using Cookies.
7. Create a student database and manipulate the records in PHP.
8. Create an employee database and manipulate the records in PHP.
9. Create a course registration form with name, address and list of available course. Reply with the corresponding course fees on selection of a single course or a collection of courses.
10. Write a PHP program using list box and create Multiplication table from 1 to 20.

MASTER OF COMPUTER APPLICATIONS (M.C.A.)

LIST OF ELECTIVE COURSES

(FROM THE ACADEMIC YEAR 2019-2020 ONWARDS)

ELECTIVE – I (SEM II)

1:1. ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

1:2. DIGITAL IMAGE PROCESSING

1:3. MACHINE LEARNING

ELECTIVE – II (SEM III)

2:1. SOFTWARE ENGINEERING

2:2. COMPUTER GRAPHICS

2:3. HUMAN COMPUTER INTERACTION

ELECTIVE – III (SEM IV)

3:1. E-COMMERCE

3:2. SOFTWARE PROJECT MANAGEMENT

3:3. CLOUD COMPUTING

ELECTIVE – IV (SEM V)

4:1. BIG DATA ANALYTICS

4:2. SOFT COMPUTING

4:3. SOFTWARE QUALITY ASSURANCE AND TESTING

P2R1CAEC1:1 - ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

6. To understand the basics of artificial intelligence and expert system.
7. To understand the searching techniques.
8. To understand the two knowledge about knowledge representation.
9. To understand the concept of learning.
10. To get the knowledge about applications.

Unit- I: Introduction **(Inst Hrs: 10)**

Intelligent Agents – Agents and Environments – Good behavior – The nature of environments – Structure of agents – Problem solving **(ICT)** – Problem solving agents – Example problems – Searching for solutions – Uniformed search strategies – Avoiding repeated status – Searching with partial information.

Unit-II: Searching Techniques **(Inst Hrs: 10)**

Informed search and exploration – Informed search strategies – Heuristic function – Local search algorithms and optimistic problems **(ICT)** – Local search in continuous spaces – Online search agents and unknown environments – Constrain satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems – Adversarial search – Games **(Seminar)** – Optimal decisions in games – Alpha-Beta pruning – Imperfect real time decision – Games that include an element of chance.

Unit-III: Knowledge Representation **(Inst Hrs: 08)**

First order logic – Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic – Inference in first order logic – Prepositional versus first order logic – Unification and Lifting – Forward chaining – Backward chaining – Resolution – Knowledge representation **(Assignment)** – Ontological Engineering – Categories and Objects – Actions – Simulation and events – Mental events and mental objects.

Unit-IV: Learning **(Inst Hrs: 08)**

Learning from observations – forms of learning – Inductive learning – Learning decision trees – Ensemble learning – Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming – Statistical learning methods – Learning with complete data – Learning with hidden variable – EM algorithm – Instance based learning – Neural networks – Reinforcement

learning – Passive reinforcement learning - Active reinforcement learning – Generalization in reinforcement learning**(ICT).**

Unit-V: Applications (Inst Hrs: 10)

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction – Probabilistic language processing – Probabilistic language models – Information retrieval – Information extraction – Machine translation.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Stuart Russell, Peter Norvig, "Artificial Intelligence- A modern Approach", 2nd edition, Pearson education / Prentice Hall of India, 2004.
   Unit-I: Chapter 2.1,2.2,2.3,2.4, 3.1,3.2,3.3,3.4,3.5,3.6;
   Unit-II: Chapter 4.1,4.2,4.3,4.4,4.5,4.6 , 5.1,5.2,5.4, 6.1,6.2,6.3,6.4,6.5;
   Unit-III: Chapter 8.1,8.2,8.3,8.4, 9.1,9.2,9.3,9.4,9.5, 10.1,10.2,10.3,10.4;
   Unit-IV: Chapter 18.1,18.2,18.3,18.4, 19.1,19.2,19.3,19.4,19.5, 20.1,20.2,20.3,20.4, 21.1,21.2,21.3,21.4;
   Unit-V: Chapter 22.1,22.2,22.3,22.4,22.5,22.6,22.7,22.8, 23.1,22.2,23.3,23.4.

REFERENCE BOOK (S):

1. Elaince Rich and Kevin Knight, "Artificial Intelligence",2nd edition, Tata McGraw-Hill, 2003.
2. George F.Luger, "Artificial Intelligence – Structures and Strategies for complex problem solving", Pearson Education / PHI,2015, 5th edition.

ONLINE RESOURCE (S):

1. www.tutorialspoint.com/artificial_intelligence

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Students gained knowledge on working principles of Artificial Intelligence and Neural Networks
- Students can able to apply the AI Concepts in real world applications which involve perception, reason and learning
- Students might gain the real world knowledge representation
- Students can design the difference machine learning techniques
- Students understood the various searching techniques constraint satisfaction problem

P2R1CAEC1:2 - DIGITAL IMAGE PROCESSING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To have the basic knowledge of digital image processing.
2. To understand the mathematical background for image representation, pre-processing.
3. To know about the segmentation and object recognition.
4. To have the knowledge about image compression.
5. To obtain the insight about segmentation.

UNIT–I: Introduction (Inst Hrs: 12)

Digital Image Processing – Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – Components of an Image processing System Digital Image Fundamentals: Elements of Visual Perception – Light and Electro Magnetic Spectrum – Image sensing and Acquisition **(ICT)** – Image Sampling and Quantization – Some Basic Relationships between Pixels.

UNIT-II: Image Enhancement in Spatial Domain (Inst Hrs: 10)

Some Basic Gray Level Functions – Histogram Equalization – Enhancement using Arithmetic/Logic Operations – Basics of Spatial Filtering **(Seminar)**– Smoothing Spatial Filters – Sharpening.

UNIT-III: Image Restoration (Inst Hrs: 10)

A Model of the image Degradation/ Restoration Process – Noise Models – Restoration in the presence of Noise only - Spatial Filtering **(Assignment)** – Periodic Noise Reduction by Frequency Domain Filtering – Minimum Mean-square Error Restoration **(ICT)** – Geometric Mean Filtering – Geometric Transformation

Unit IV - Image Compression (Inst Hrs: 08)

Fundamentals – Image Compression models – Error-Free Compression – LossyCompression **(ICT)** – Image compression Standards.

UNIT – V: Segmentation (Inst Hrs: 06)

Detection of Discontinuities – Edge Linking and Boundary Detection – Thresholding – Region Based Segmentation – Segmentation by Morphological Watersheds – The use of Motion Segmentation.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Rafael C. Gonzalez, Richard E.Woods, "Digital Image Processing," Prentice Hall, Third Edition, 2008.

Unit – I: Chapter 1, 2; Unit – II: Chapter 3; Unit – III : Chapter 5;

Unit – IV: Chapter 8; Unit – V: Chapter 10.

REFERENCE BOOK (S):

1. B.Chandra and D Dutta Majunder,"Digital Image Processing and Analysis",2011,2nd Edition, PHI learning Pvt Ltd.

ONLINE RESOURCE (S):

1. www.engineersgarage.com/articles/image-processing-tutorial-applications

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Analyze general terminology of digital image processing
- Learn different techniques employed for the enhancement of images.
- Understand the need for image compression
- Learn the spatial and frequency domain techniques of image compression
- Understand the segmentation techniques.

P2R1CAEC1:3 - MACHINE LEARNING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To introduce students to the basic concepts and techniques of Machine Learning.
2. To have a thorough understanding of the Supervised and Unsupervised learning techniques
3. To study the various probability based learning techniques
4. To know the concept and logic genetic algorithms
5. To understand graphical models of machine learning algorithms

UNIT-I: INTRODUCTION (Inst Hrs: 06)

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron **(ICT)** – Design a Learning System – Perspectives and Issues in Machine Learning – Linear Discriminants – Perceptron – Linear Separability– Linear Regression.

UNIT-II: LINEAR MODELS (Inst Hrs: 08)

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer - Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back - Propagation –Radial Basis Functions and Splines – Concepts – RBF Network – Curse of Dimensionality –Interpolations and Basis Functions – Support Vector Machines **(Seminar)**

UNIT-III: TREE AND PROBABILISTIC MODELS (Inst Hrs: 12)

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees **(ICT)** – Ensemble Learning – Boosting – Bagging **(Assignment)** – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities– Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms –Vector Quantization – Self Organizing Feature Map

UNIT IV: DIMENSIONALITY REDUCTION (Inst Hrs: 10)

Dimensionality Reduction – Linear Discriminate Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: Genetic Operators – Using Genetic Algorithms **(ICT)** – Reinforcement Learning – Overview – Getting Lost Example – Markov Decision Process

Unit – V: GRAPHICAL MODELS (Inst Hrs: 10)

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models **(ICT)** – Tracking Methods.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Stephen Marsland, ―Machine Learning – An Algorithmic Perspective‖, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014

Unit – I: Chapters 1, 2; Unit - II: Chapters 3, 4, 5; Unit – III: Chapters 6, 7, 8, 9;

Unit – IV: Chapters 10, 11, 12, 13; Unit – V: Chapters 14, 15 .

REFERENCE BOOK (S):

1. Tom M Mitchell, ―Machine Learning‖, First Edition, McGraw Hill Education, 2013.
2. Peter Flach, ―Machine Learning: The Art and Science of Algorithms that Make Sense of Data‖, First Edition, Cambridge University Press, 2012.
3. Jason Bell, ―Machine Learning – Hands on for Developers and Technical Professionals‖, First Edition, Wiley, 2014

ONLINE RESOURCE (S):

1. www.guru99.com/machine-learning-tutorial.html

COURSE OUTCOMES:

- Distinguish between, supervised, unsupervised and semi-supervised learning
- Apply the apt machine learning strategy for any given problem
- Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem
- Design a system that uses the appropriate graph models of machine learning
- Modify existing machine learning algorithms to improve classification efficiency

P3R1CAEC2:1 - SOFTWARE ENGINEERING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of software engineering.
2. To understand the concepts of requirement engineering tasks.
3. To get the knowledge about design process.
4. To gain the knowledge about software testing.
5. To get the knowledge about software quality concepts.

UNIT - I: Introduction to software engineering (Inst Hrs: 10)

A process framework- CMMI- Process Patterns-Process Assessments- Personal and Team Process Model – Process Technology – Product and Process – Process Models : Waterfall Model – Incremental Process Model – Evolutionary Process Model – Specialized Process Model **(ICT)** – Unified Process – Computer Based Systems – System Engineering Hierarchy – Business Process Engineering – Product Engineering – System Modeling.

UNIT - II: Requirement Engineering (Inst Hrs: 10)

Requirement Engineering Tasks – Initiating the Requirements Engineering Process – Eliciting Requirements – Developing Use Cases **(Seminar)** – Building the Analysis Model – Validating Requirements – Negotiating Requirements – Requirements Analysis – Analysis Modeling Approaches – Data Modeling Concepts – Object Oriented Analysis – Scenario Based Modeling – Flow Oriented Modeling – Class Based Modeling – Creating a Behavioral Model.

UNIT - III: System Design (Inst Hrs: 10)

Design process and Design Quality – Design Concept – Design Model – Pattern Based Software Design – Software Architecture – Data Design – Architectural styles and Patterns – Architectural Design – Assessing alternative Architectural Designs – Mapping Data Flow into a Software Architecture – Components **(Assignment)** – Designing class Based Components – Conducting Component Level Design – Object Constraint Language – Designing Conventional Components.

UNIT-IV: Software Testing (Inst Hrs: 08)

A Strategic Approach to Software Testing – Test for Conventional Software – Test for Object Oriented Software – Validation Testing – System Testing – The Art of Debugging – Software Testing Fundamentals – Black Box and White Box Testing **(ICT)** – Object Oriented Testing Methods – Interclass Test Case Design.

UNIT-V: Software Quality Assurance and Risk Management (Inst Hrs: 08)

Quality Concept – Software Quality Assurance – Software Reviews – Formal Technical Reviews – Formal Approaches to SQA – Statistical SQA – Software Reliability Risk: Software Risks – Risk Identification – Risk Projection – Risk Refinement – Risk Mitigation, Monitoring and Management – RMMM Plan **(ICT).**

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Roger S. Pressman, "Software Engineering – A Practioner's Approach",McGraw Hill, 6th Edition,2009

Unit-I: Chapter 1, 2, 3, 6; Unit-II: Chapter 7, 8; Unit-III: Chapter 9, 10, 11;

Unit- IV: Chapter 13, 14; Unit-V: Chapter 25, 26.

REFERENCE BOOK (S):

1. Richard Fairley, "Software Engineering Concepts" , McGraw Hill 2016.
2. Ian Sommerville, "Software Engineering", Pearson Education, 10th Edition.

ONLINE RESOURCE (S):

1. www.wisdomjobs.com/e-university/software-engineering-tutorial-338.html

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Know the different process model
- Understand software requirements of the client to design the software
- Assess the software design quality
- Gain the knowledge of software testing and design process
- Acquire a job as a software programmer or tester

P3R1CAEC2:2 - COMPUTER GRAPHICS

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of computer graphics.
2. To understand the attributes of output primitives.
3. To get the knowledge about GUI & interactive input methods.
4. To understand the geometric and modeling transformation.
5. To understand the concept of color models.

UNIT-I: Overview of Computer System (Inst Hrs: 10)

Display Devices – Hard copy devices - Interactive input devices - Display Processor - Graphics Software - Output primitives - Line drawing algorithms **(ICT)** - Initializing lines – Line Commands - Fill areas - Circle generation algorithms - Area functions - Cell array.

UNIT-II: Attributes of output primitives (Inst Hrs: 10)

Line style - Color and intensity - Area filling algorithm - Character attributes - Inquiry function - Bundled attributes - Two dimensional transformations - Basic and composite transformations – Translation - Rotation – Scaling - Matrix representations **(Seminar)**.

UNIT-III: GUI &Interactive input methods (Inst Hrs: 10)

Interactive Input Methods - Physical Input Methods **(Assignment)**- Logical classification of input devices - Interactive Picture construction techniques - Input Functions - Initial values of inputs - Device parameter - Interactive picture - Construction techniques - Virtual reality environments **(ICT)**.

UNIT-IV: Geometric and modeling transformations (Inst Hrs: 08)

Translation – Rotation – Scaling - Other transformations functions - 3D transformation function - Modeling and Coordinates Transformation – Projections – Clipping **(ICT)** - Hardware implementations - 3D viewing functions.

Unit-V: Color models (Inst Hrs: 08)

Properties of lights - XYZ color model - CIE chromaticity diagram - Intuitive color concepts - RGB color model - YIQ color model - CMY color model – HSV color model – Conversion between HSV& RGB models - HLS color model –Color Selection Applications.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1."Computer Graphics" –Donald D Hearn and M.Pualine Baker , 2014, Pearson, 2nd Edition.

Unit-I: Chapter 2,3; Unit-II: Chapter 4,5; Unit-III :Chapter 8;

Unit-IV: Chapter 11; Unit-V: Chapter 15.

REFERENCE BOOK (S):

1. N. KrishnaMurthy,"Introduction to Computer Graphics",2006,Tata McGraw Hill.
2. Chennakesava R. Alavala,"Computer Graphics",2009, PHI Learning Pvt Ltd.

ONLINE RESOURCE (S):

1. www.javatpoint.com/computer-graphics-tutorial

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Learn the basics of computer graphics
- Learn the attributes of output primitives
- Get the knowledge about GUI based methods
- Learn the geometric and modeling transformation
- Understand the concept of color models

P3R1CAEC2:3 - HUMAN-COMPUTER INTERACTION

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of Human - Computer interaction.
2. To understand the interaction design basics.
3. To get the knowledge about HCI in the software process.
4. To gain the knowledge about cognitive models.
5. To gain the knowledge about task analysis.

UNIT-I: The Interaction (Inst Hrs: 08)

Introduction**:** Models of interaction-Frameworks and HCI – Ergonomics **(ICT)** - Interaction styles - Elements of the WIMP interface - Interactivity - The context of the interaction-Experience, Engagement and fun**.**

UNIT-II: Interaction design basics (Inst Hrs: 08)

Introduction to Design – The process of design - User focus – Scenarios - Navigation design - Screen design and Layout **(Seminar)** - Iteration and prototyping.

UNIT-III: HCI in the software process (Inst Hrs: 10)

Introduction - The software life cycle - Usability engineering - Iterative design and prototyping - Design rationale. Design rules: Introduction - Principles to support usability-Standards – Guidelines - Golden rules and Heuristics **(Assignment)** - HCI patterns.

UNIT - IV: Cognitive Models (Inst Hrs: 10)

Introduction - Goal and task hierarchies - Linguistic models - The challenge of display - based systems - Physical and device models - Cognitive architectures. Communication and collaboration models: Introduction - Face-to-face communication –Conversation - Text-based communication **(ICT)** - Group working.

UNIT-V: Task analysis (Inst Hrs: 10)

Introduction - Differences between task analysis and other techniques - Task decomposition - knowledge-based analysis - Entity-Relationship - Based Techniques - Sources of information and data collection - Uses of task analysis. Dialog notations and design: Dialog - Dialog design notations - Diagrammatic notations - Textual dialog notations **(ICT)** - Dialog semantics - Dialog analysis and design.

UNIT-VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Alan Dix, Janet Finlay, Gregory D.Abowd, Russell Beale, "Human - Computer Interaction" 3rd edition, Pearson Education.

Unit-I: Chapter 1; Unit-II: Chapter 5; Unit-III: Chapter 6,7;

Unit-IV: Chapter 12, 14; Unit-V: Chapter-15, 16.

REFERENCE BOOK (S):

1. I.Scott Mackenzie "Human Computer Interaction An Empirical Research Perspective, 2013, Morgan Kaufmann Publishers.

ONLINE RESOURCE (S):

1. http://hci.liacs.nl/tutorials

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Learn the basics of HCI
- Understand the interaction design basics
- Gain the knowledge about HCI in the software process
- Get the knowledge about Cognitive models
- Learn about task analysis

P4R1CAEC3:1 - E-COMMERCE

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of e-commerce.
2. To gain the knowledge about network infrastructure.
3. To understand the electronic commerce and World Wide Web.
4. To understand the concept of electronic payment system.
5. To understand the consumer search and resource discovery.

Unit - I: Welcome to Electronic Commerce (Inst Hrs: 10)

Electronic Commerce Framework - Electronic Commerce and Media Convergence – The Anatomy of E-Commerce Applications - Electronic Commerce Consumer – Applications Electronic Commerce Organization Applications **(ICT)**. The Network Infrastructure for Electronic Commerce: Components of the High Way – Network Access Equipment – Global Information Distribution Networks.

Unit - II: Internet as a Network Infrastructure (Inst Hrs: 10)

The Internet Terminology – Chronological History – NSFNET Architecture and Components – National Research and Education Network – Globalization of the academic Internet – Internet Governance – An Overview of Internet Applications **(Seminar)** . The Business of Internet Commercialization: Telco/Cable/On-Line Companies – National Independent ISPs – Regional Level ISPs – Local – Level ISPs – Service Provider – Service Provider Connectivity – Logistics of Being an Internet Service Provider – Internet Connectivity Options.

Unit - III: Electronic Commerce and The World Wide Web (Inst Hrs: 10)

Architectural Framework for Electronic Commerce – World Wide Web as the Architecture **(Assignment)** – Web Background – Technology behind the web – Security and the Web, Consumer – Oriented Electronic Commerce :Consumer – Oriented Applications – Mercantile Process Model – Mercantile Models from the Consumers Perspective – Mercantile Models from the Merchants Perspective.

Unit - IV: Electronic Payment Systems (Inst Hrs: 08)

Types of Electronic Payment Systems – Digital Token based Electronic Payment Systems – Smart cards and Electronic Payment System – Credit card – Based Electronic Payment Systems – Risk and Electronic Payment Systems **(ICT)** – Designing Electronic Payment Systems. Inter Organizational Commerce and EDI: Electronic Data Interchange –

EDI Applications in Business – EDI: Legal, Security and Privacy issues – EDI and Electronic Commerce.

Unit - V: Consumer Search and Resource Discovery (Inst Hrs: 08)

Information Search and Retrieval – Electronic Commerce Catalogs – Information Filtering – Consumer – Data Interface – Emerging Tools .on Demand Education and Digital Copyrights: Computer-Based Educational and Training – Technological Components of Education on Demand – Digital Copyrights and Electronic Commerce. Software Agents – Applets, Browsers and Software Agents **(ICT)**.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1."Frontiers of Electronic Commerce" , Ravikalakota & Andrew Whinston,Adison Wesley 2000.(Reprint -2013)

Unit - I: Chapter 1, 2 – 2.2, 2.3, 2.5; Unit - II: Chapter 3,4; Unit - III: Chapter 6,7;

Unit - IV: Chapter 8, 9; Unit - V: Chapter 14, 15, 16-16.2, 16.3, 16.6.

REFERENCE BOOK (S):

1. Jaiswal.S,"Doing Business on the internet- E-Commerce",2010,Galgotia

2. Murthy C.S.V,"E- Commerce Concepts,Models,Strategies ",2004, Himalaya Publications.

ONLINE RESOURCE (S):

1. https://www.htmlgoodies.com/beyond/webmaster/projects/electronic-commerce-tutorial.html

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Understand the infrastructure for E-Commerce
- Manage the Business of internet commercialization
- Develop the insight about WWW
- Learn the benefits and risk of e-payment system
- Utilize the software agents

P4R1CAEC3:2 - SOFTWARE PROJECT MANAGEMENT

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of software project management.
2. To understand the software management, project management, process frame work.
3. To get the knowledge about management disciplines.
4. To gain the knowledge about project control.
5. To get the knowledge about risk management.

UNIT-I: Software Management Renaissance (Inst Hrs: 08)

Software Management Renaissance: Conventional Software Management – Evolution of Software Economics – Improving Software Economics **(ICT)** – The Old Way and the New.

UNIT-II: A Software Project Management (Inst Hrs: 08)

A Software Management Project Management Process Framework: Life-Cycle Phases **(Seminar)** -Artifacts of the Process – Model – Based Software Architectures – Work Flows of the Process **(ICT)** – Check Points of the Process.

UNIT-III: Software Management Disciplines (Inst Hrs: 10)

Software Management Disciplines: Iterative Process Planning – Project Organizations and Responsibilities- Process Automation**(Assignment)**.

UNIT-IV: Software Management Disciplines (Inst Hrs: 10)

Software Management Disciplines: Project Control and Process Instrumentation – Tailoring the Process **(ICT)**.

UNIT-V: Risk Management (Inst Hrs: 10)

Risk Management: Introduction – Risk – Categories of Risk – A Framework for Dealing with Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management – Evaluating Risk to Schedule **(ICT)** – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts.

Unit - VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Software Project Management, bob Hughes & Mike Cotterell, Rajib Mall, Tata McGraw Hill,5th edition,2014.

Unit-I: Chapter 1, 2, 3, 4; Unit-II: Chapter 5, 6, 7, 8;

Unit-III: Chapter 10, 11, 12, 13, 14; Unit-IV: Chapter 15, 16, 17;

2. Walker Royce, "Software Project Management", 2006 Edition, Pearson Education,

Unit-V: Chapter 7.

REFERENCE BOOK (S):

1. Kelkar S.N.,"Software Project Management A Concise study,PHI Learning Pvt Ltd,2008

ONLINE RESOURCE (S):

1. https://www.geeksforgeeks.org/software-engineering-project-management-process/

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Identify the factors to improving software cost
- Listing the Artifacts sets produced throughout the development process
- Acquire and practice process automation
- Applying the software management disciplines
- Enlisting the various risks involved in software development process

P4R1CAEC3:3 - CLOUD COMPUTING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES :

1. To understand the basic concepts of cloud computing, cloud components, cloud architecture and services.
2. To understand the design of cloud services.
3. To learn about network security and services.
4. To understand the overview of cloud storage.
5. To identify the service of software plus and its developing applications.

Unit–I: Cloud Computing Basics (Inst Hrs: 08)

Cloud Computing Overview: Disambiguation - Cloud Computing - Cloud Components: Infrastructure - Service Application: Storage – Database **(ICT)** – Intranets and the Cloud: Components - Hypervisor Application – First Movers in the Cloud: Amazon – Google -Microsoft.

Unit–II: Cloud Computing Scenarios (Inst Hrs: 10)

Your Organisation and Cloud Computing: When You Can Use Cloud Computing: Scenarios: Use Cloud Computing - Benefits: Scalability – Simplicity - Knowledgeable Vendors - More Internal Resources – Security - Limitations: Your Sensitive Information **(Seminar)** – Application Not Ready - Developing Your Own Application – Security Concerns: Privacy Concerns With a Third Party - Doing Enough to Secure It - Security Benefits - Cloud Computing With the Titans: Google – EMC – Net App – Microsoft – Amazon -SalesForce.com – IBM **(ICT)**.

UNIT–III: Cloud Computing Services (Inst Hrs: 10)

The Business Case For Going to the Cloud: Cloud Computing Services - Infrastructure as a Service - Platform as a Service - Software as a Service - How Those Application Help Your Business: Operational Benefits - Economic Benefits - Tips for Evaluating SaaS - Staffing Benefits - Hardware and Infrastructure: Clients: Mobile – Thin –Thick - Security: Data Leakage - Offloading Work – Logging – Forensicss**(Assignment)** – Development – Auditing - Network: Basic Public Internet - The Accelerated Internet - Optimized Internet Overlay - Site-to-Site VPN Cloud Providers - Cloud Consumers – Pipe – Redundancy - Services: Identity – Integration – Mapping – Payments - Search.

UNIT–IV: Cloud Storage Overview **(Inst Hrs: 10)**

The Basics-Storage as a Service-Providers-Security-Reliability-Cautions- Outages-Theft - Cloud Storage for me - Cloud Storage Providers: Amazon Simple Storage Service (S3)- Nirvanix - Google Big table Data store- MobileMe- Live Mesh-Software as a Service: Overview: Advantages-Software-Considerations-Vendor Advantages-Limitations -Driving Forces: Popularity - Virtualization Benefits - SaaS and SOA -Economic Impact Company Offerings: Intuit- Google-Microsoft-IBM.

UNIT–V: Software plus Services **(Inst Hrs: 08)**

Overview: Pros – Cons – Vendors - Mobile Device Integration: Google Android - Providers: Adobe AIR - Apple iPhone SDK - Developing Applications: Google Payment Force.com and Google Gears - Microsoft: Live Services - Microsoft SQL Services - Microsoft .NET Services - Microsoft SharePoint Services and Dynamics CRM Services - Migrating to the Cloud: Cloud Services for Individuals: Available Services - Skytap Solution - Cloud Services Aimed at the Mid Market:Force.com - Enterprise - ClassCloud Offerings: MS Exchange – Vmotion - VMware VCenter Converter – Hyper - VLive Migration**(ICT)**.

Unit - VI: Latest Learning (For CIA only): **(Inst Hrs: 02)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Anthony T.Velte Toby J. VelteRobert Elsenpeter, "**Cloud Computing: A practical Approach",TataMcGrow Hill, 2010**

Unit - I: Chapter 1; Unit-II: Chapter 2, 3; Unit-III : Chapter 4, 5;

Unit - IV: Chapter 7, 9; Unit-V: Chapter 10, 11, 12.

REFERENCE BOOK (S):

1. Barrie Sosinsky,"Cloud Computing Bible", 2011, Wiley Publishers.

2.Kris Jamsa,"Cloud Computing",2015,Jones and Bartlett India Pvt Ltd.

ONLINE RESOURCE (S):

1. https://data-flair.training/blogs/cloud-computing-tutorial/

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Gain the knowledge about basics of cloud computing
- Understand the services in cloud
- Knowledge about Cloud Network Security and services
- Learn about the overview of Storage on cloud
- Understand the knowledge on services of software plus and its developing applications

P5R1CAEC4:1 - BIG DATA ANALYTICS

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics of Big Data and Big Data Analytics
2. To get the knowledge about NoSQL and Hadoop
3. To learn about MongoDB and Cassandra
4. To gain the knowledge about MapReduce Programming and Hive
5. To get the knowledge about Pig and basics of Machine Learning

UNIT – I: Introduction to Big Data (Inst Hrs: 08)

Classification of Digital Data: Structured, Semi structured, Unstructured Data – Characteristics of Data - Evolution of Big Data – Definition of Big Data - Challenges with Big Data - Needs of Big Data. Introduction to Big Data Analytics – Classification of Analytics – Importance of Big Data Analytics **(ICT)** – Top Challenges Facing Big Data – Data Science – Responsibilities of a Data Scientist – Terminologies used in Big Data Environments –BASE.

UNIT – II: The Big Data Technology Landscape (Inst Hrs: 10)

Introduction to NoSQL – Advantages of NoSQL – Types of NoSQL Databases – SQL Versus NoSQL – NewSQL – Comparison of SQL, NoSQL and NewSQL **(ICT)**. Hadoop: Features of Hadoop – Advantages of Hadoop – Versions of Hadoop – Hadoop Versus SQL – Cloud Based Hadoop Solutions – RDBMS Versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop overview – HDFS – Interacting with Hadoop Eco System **(Seminar)**.

UNIT – III: MongoDB & Cassandra (Inst Hrs: 10)

Introduction - Terms used in RDBMS and MongoDB – Data types in MongoDB – MongoDB Query Language – Apache Cassandra-An Introduction: Features of Cassandra – CQL Datatypes – CQLSH – Keyspaces – CRUD Operations **(Assignment)** – Collections – Using a Counter – TTL – Alter Commands – Import and Export – Querying System Tables-Practice Examples.

UNIT – IV: MapReduce Programming and Hive (Inst Hrs: 10)

Introduction: Mapper, Reducer, Combiner, Partitioner, Searching,Sorting, Compression. Introduction to Hive – Hive Architecture – Hive Data types – FileFormat – HQL – RcFileImplementation – SerDe –User DefinedFunction.

UNIT – V: Introduction to Pig **(Inst Hrs: 08)**

The Anatomy of Pig – Pig on Hadoop – PigLatin Overview – Data types – HDFS Commands – Eval Function – Complex Data types – Piggy Bank – User Defined Function – Parameter Substitution – Diagnostic Operator – Word Count Example in Pig - Introduction to Machine Learning: Definitions – Machine Learning Algorithms **(ICT)**.

Unit - VI: Latest Learning (For CIA only): **(Inst Hrs: 02)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. Seema Acharya, Subhashini Chellapan, "BIG DATA AND ANALYTICS", Wiley India Pvt Ltd.,2018.

Unit-I: Chapters 1, 2, 3; Unit-II: Chapters 4, 5; Unit-III: Chapters 6,7;

Unit-IV: Chapters 8, 9; Unit-V: Chapter 10, 12.

REFERENCE BOOK (S):

1. "Big Data Black Book", DreamTech Publications 2017.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/big_data_tutorials.htm

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Understand about Big Data and Big Data Analytics
- Gain the insights of NoSQL and Hadoop
- Having the expertise in MongoDB & Cassandra
- Gain the knowledge in Mapreduce and Hive
- Get the knowledge in Pig and Machine Learning.

P5R1CAEC4:2 - SOFT COMPUTING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To learn the various soft computing frameworks.
2. To get the insight about types of neural networks
3. To gain the knowledge about genetic Algorithms.
4. To learn about the Neuro-Fuzzy Modeling.
5. To understand the applications of soft computing.

Unit-I: Introduction to Neuro- Fuzzy and Soft Computing (Inst Hrs: 10)

Introduction - Soft Computing constituents and conventional Artificial Intelligence - Neuro - Fuzzy and Soft Computing Characteristics. Fuzzy Sets : Introduction - Basic Definition and Terminology - Set Operations **(ICT)** - Member Function Formulation and Parameterization - More on Fuzzy Union ,Intersection, Complement - Fuzzy Complement- Fuzzy Intersection and Union. Fuzzy Rules and Fuzzy Reasoning: Introduction- Extension Principle and Fuzzy Relations - Fuzzy If-Then Rules, Fuzzy Reasoning .Fuzzy Inference Systems: Introduction - Mamdani Fuzzy Models - Sugeno Fuzzy Models - Tsukamoto Fuzzy Models-Other considerations.

Unit-II: Neural networks (Inst Hrs: 10)

Adaptive Networks: Introduction-Architecture-Back Propagation for Feed Forward Networks. Supervised Learning Neural Network: Introduction - Perceptrons **(Seminar)** – Adaline - Back Propagation Multilayer Perceptrons - Radial Basis Function Networks. Unsupervised Learning and Other Neural Networks: Introduction- Competitive Learning Networks - Kohonen Self-Organizing Networks - Learning Vector Quantization, Hebbian Learning - The Hopfield Network **(ICT)**.

Unit-III: Neuro-Fuzzy Modeling (Inst Hrs: 10)

ANFIS: Adaptive Neuro-fuzzy Interface Systems: Introduction - ANFIS Architecture - Hybrid Learning Algorithm.Advanced Neuro Fuzzy Modeling Classification and Regression Trees: Introduction –D ecision Trees – CART Algorithm for Tree Induction - Data Clustering Algorithms – Introduction -K-Means clustering **(Assignment)** - Fuzzy C-Means clustering.

Unit-IV: Genetic Algorithm (Inst Hrs: 08)

Genetic algorithm and search space – general genetic algorithm – operators in GA – stopping condition for GA – constraints in GA– classification of GA – genetic programming – Advantages and Limitations of GA – Applications of GA**(ICT).**

Unit-V: Hybrid Soft Computing Techniques (Inst Hrs: 08)

Neuro-fuzzy hybrid systems – genetic neuro hybrid systems – genetic fuzzy hybrid and fuzzy genetic hybrid systems – simplified fuzzy ARTMAP – Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing based hybrid fuzzy controllers.

Unit-VI: Latest Learning (For CIA only): (Inst Hrs: 02)

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. J.S.R.Jang, C.T. Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI Pearson Education 2004.

Unit-I: Chapter 1, 2, 3, 4; Unit-II: Chapter 8, 9; Unit-III: Chapter 12, 14, 15;

2. S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt Ltd, 2011.

Unit-IV: Chapter 15; Unit-V: Chapter 16, 17.

REFERENCE BOOK (S):

1. Stamatios V. Kartalopoulos "Understanding Neural Networks and Fuzzy Logic Basic concepts & Applications", IEEE Press, PHI, New Delhi, 2004.

ONLINE RESOURCE (S):

1. https://www.tutorialspoint.com/fuzzy_logic/

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Yield the knowledge about various soft computing frameworks
- Attain the insight about types of Neural Networks
- Capture the proficiency of Neuro-fuzzy models
- Gain the cognizance about the applications of genetic algorithms
- Obtain the insight of hybrid soft computing techniques

P5R1CAEC4:3 - SOFTWARE QUALITY ASSURANCE AND TESTING

Max Marks : 25 + 75 = 100 **Hrs / Week : 04**

Credit : 4 **Total Inst. Hrs: 48**

COURSE OBJECTIVES:

1. To understand the basics software quality assurance and testing.
2. To get the knowledge about types of testing.
3. To understand the testing fundamentals and specialized testing.
4. To gain the knowledge about test management.
5. To get the knowledge about test automation.

Unit I : Introduction **(Inst Hrs: 08)**

Principles of Testing - Software Development Life Cycle Models **(ICT)**.

Unit II : Types of Testing **(Inst Hrs: 10)**

White Box Testing - Integration Testing **(Seminar)** - System and acceptance testing.

Unit III : Testing Fundamentals - 2 & Specialized Testing **(Inst Hrs: 10)**

Testing Performance Testing - Regression testing **(Assignment)** - Testing of Object Oriented Systems - Usability and Accessibility Testing.

Unit IV : Test Management **(Inst Hrs: 10)**

Testing Planning, Management **(ICT)**, Execution and Reporting.

Unit V : Test Automation **(Inst Hrs: 08)**

Software Test Automation - Test Metrics and Measurements **(ICT).**

Unit - VI: Latest Learning (For CIA only): **(Inst Hrs: 02)**

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. "Software Testing" - Srinivasan Desikan, Gopalaswamy Ramesh, Pearson Education, 2006.

Unit-I: Chapters 1, 2; Unit-II: Chapters 3, 5, 6; Unit-III: Chapters 7, 8, 11, 12;

Unit-IV: Chapter 15; Unit-V: Chapters 16, 17.

REFERENCE BOOK (S):

1. Limaye M.G, "Software Testing Principles Techniques and Tools",2009, TMH Publications.

ONLINE RESOURCE (S):

1. https://www.tutorialride.com/software-testing/software-quality-assurance.htm
2. https://www.javatpoint.com/software-testing-tutorial

COURSE OUTCOMES:

After the successful completion of the Course the students shall be able to,

- Analyze the various software development model
- Practicing white box testing method
- List out the scenarios in Usability and Accessibility testing
- Develop a test plan
- Practicing the acquired test metrics