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 2020 - 2021)

Programme Structure

Semester	Course Code	Course Title	Hrs / Week	Credit	Exam Hrs	Marks		Total
						Int	Ext	
I	P1R2CACC1	Digital Computer Fundamentals	5	4	3	25	75	100
	P1R2CACC2	Data Structures and Algorithms in C++	5	4	3	25	75	100
	P1R2CACC3	Java Programming	5	4	3	25	75	100
	P1R2CACC4	Operating System	5	4	3	25	75	100
	P1R2CACC5	Management Information System	4	4	3	25	75	100
	P1R2CACC6P	Data structures and Algorithm in C++ Practical	3	3	3	40	60	100
	P1R2CACC7P	Java Programming Practical	3	3	3	40	60	100
		Total	**30**	**26**	**-**	**-**	**-**	**700**
II	P2R2CACC8	Database Management system	5	4	3	25	75	100
	P2R2CACC9	.NET Technologies	5	4	3	25	75	100
	P2R2CACC10	Data Communication Networks	5	4	3	25	75	100
	P2R2CACC11	Discrete Mathematics	5	4	3	25	75	100
	P2R2CAEC1	**E – I :**To be selected from the list	4	4	3	25	75	100
	P2R2CACC12P	RDBMS Practical	3	3	3	40	60	100
	P2R2CACC13P	.NET Technologies Practical	3	3	3	40	60	100
		Total	**30**	**26**	**-**	**-**	**-**	**700**

III	P3R2CACC14	Compiler Design	5	4	3	25	75	100
	P3R2CACC15	Distributed Technologies	5	4	3	25	75	100
	P3R2CACC16	Data mining and Ware housing	5	4	3	25	75	100
	P3R2CACC17	Network Security	5	4	3	25	75	100
	P3R2CAEC2	**E - II:** To be selected from the list	4	4	3	25	75	100
	P3R2CACC18P	Distributed Technologies using J2EE Practical	3	3	3	40	60	100
	P3R2CACC19P	Network Security Practical	3	3	3	40	60	100
		Total	**30**	**26**	**-**	**-**	**-**	**700**
IV	P4R2CAEC3	**E – III:** To be selected from the list	5	4	3	25	75	100
	P4R2CAPW	Major Project work	-	8	-	-	-	100
		Total		**12**	**-**	**-**	**-**	**200**
		Grand Total	**-**	**90 + EC***	**-**	**-**	**-**	**2300**

***Extra Credits** other than the **mandatory 90 Credits** can be earned by the students by enrolling themselves in the **MOOCs Courses** – which is **optional**

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

List of Elective Courses

(To be followed from the Academic Year 2020-2021)

ELECTIVE – I (Any 01 in Semester - II)

1:1. Artificial Intelligence and Expert System

1:2. Digital Image Processing

1:3. Internet of Things

ELECTIVE – II (Any 01 in Semester - III)

2:1. Software Engineering

2:2. Big Data Analytics

2:3. Machine Learning

ELECTIVE – III (Any 01 in Semester - IV)

3:1. Software Quality Assurance and Testing

3:2. Pervasive Computing

3:3. Cloud Computing

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 in depth knowledge in the field of Computing
- To harness the existing Programming skill
- Understanding the concept of logical thinking and programming
- Ability to analyze, identify, formulate and develop modern computing techniques
- Ability to achieve Global recognization
- Able to work as I.T Professionals exhibiting social Responsiveness
- Able to exhibit ethical behaviour and adhere to Cyber Laws

P1R2CACC1: 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

P1R2CACC2: DATA STRUCTURES AND ALGORITHMS IN C++

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 (Inst Hrs: 12)

Why was C++ developed - Features of C++: structure of C++ Program – Keywords in C++ - .C++ Syntax – Input and output in C++ - Data Types: Introduction - Data type – Data Structure – Simple Data Types in C++ - Homogeneous Aggregate Data Types. – Heterogeneous Aggregate Data Types – Data Abstraction – Abstract Data Type.

UNIT - II: Starting with ADT, Arrays and String (Inst Hrs: 12)

Starting with ADT: Introduction – Complex Number as ADT – operation on a complex number – Rational number as ADT – The set ADT – Arrays: Introduction – operation on Arrays – Types of Arrays – String representation – operations on string – Types of string.

UNIT - III: Linked List (Inst Hrs: 12)

Linked List: Introduction – Dynamic Storage Management – fixed size (Array Based) Linked List ADT – Linked List ADT – Single Linked List ADT – Doubly Linked list ADT – Circular List ADT.

UNIT - IV: Stack and Queues (Inst Hrs: 11)

Stack: Introduction – Applications of stack Data structure – operations on stack ADT – Types of stack implementation – fixed size stack ADT – Variable size stack ADT.

Queues: Introduction – structure of a Queue – operations on a Queue – simple static Array based implementation.

UNIT - V: Trees and Graphs (Inst Hrs: 10)

Trees: Introduction – multiway Trees – Binary Trees – Binary Tree implementation using Array – implementing multiway Tree.

Graphs: Introduction – Basic concepts and terms – Graph representation – Transitive closure – warshall's Algorithm - shortest paths Algorithms: Dijkstra Algorithm – Floyd's Algorithm – Dynamic Arrays for Graph's Algorithm.

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

Latest development related to the Course during the Semester Concerned

TEXT BOOK (S):

1. N.S.Kutti and P.Y.Padhye, "Data Structures in C++",PHI, Seventh printing 2011.

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

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

REFERENCE BOOK (S):

1. Yedidyah Langsam, Moshe J.Augenstein, Aaron M.Tenenbaum, "Data structures using C and c++",PHI, 2007
2. Seymour Lipschutz,G.A Vijayalakshmi, "Data Structures" , TMH, 2008
3. 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

P1R2CACC3: JAVA PROGRAMMING

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

P1R2CACC4: OPERATING SYSTEM

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

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

COURSE OBJECTIVES:

1. To understand the principles behind operating system
2. To understand the design issues associated with operating system
3. To understand the knowledge of memory management techniques.
4. To understand the concept of process management
5. To understand the concept of file systems

UNIT – I: Introduction to operating systems (Inst Hrs: 12)

Evolution of operating systems - Functions – Different views of OS – Batch processing, Multiprocessing, Time sharing OS – I / O programming concepts – Interrupt Structure & processing

UNIT – II: Memory Management (Inst Hrs: 12)

Memory Management – Single Contiguous Allocation- Partitioned Allocation – Relocatable Partitions allocations – Paged and Demand paged Memory Management – Segmented Memory Management – Segmented and Demand paged Memory Management – overlay Techniques - Swapping

UNIT – III: Processor Management (Inst Hrs: 12)

Processor Management – Job Scheduling – Process Scheduling – Functions and Policies – Evolution of Round Robin Multiprogramming Performance – Process Synchronization – Wait and Signal mechanisms – Semaphores P & V Operations – Deadlock – Banker's Algorithm.

UNIT – IV: Device Management (Inst Hrs: 12)

Device Management – Techniques for Device Management – I/O Traffic Controller, I/O Scheduler, I/O Device Handlers – Spooling.

UNIT – V: File Management (Inst Hrs: 12)

Simple File System, General Model of a File System, Physical and Logical File System. Case Studies: MSDOS, UNIX.

UNIT – VI: Latest Learning (for CIA only) (Inst Hrs: 12)

Latest development related to the course during the semester concern

Text Book:

1. Operating Systems – E. Madnick & John J.Donavan, Tata McGraw Hill Publishing Co., Limited. [Unit-1 (Chapters – 1, 2); Unit-2 (Chapters – 3); Unit-3 (Chapters – 4); Unit-4 (Chapters – 5); Unit-5 (Chapters – 6)]

Reference Books:

1. System Programming and Operating Systems – D.M. Dhamdhere, Tata McGraw Hill Publishing Co., Limited.
2. Singh, Neetu," Operating System",New Delhi: Global Vision Publishing House, 2012. ISBN: 978-81-8220-362-4
3. Mohan, Cgandra I," Operating System",New Delhi: PHI Learning Private Limited, 2013. ISBN: 978-81-203-4726-7
4. Sridhar, V,"Operating System", Chennai: Vijay Nicole Imprints Pvt Ltd, 2014. ISBN: 978-81-8209-378-2
5. Josuttis, Nicolai M," SOA in Practice the Art of Distributed System Design. Mumbai: Shroff Publishers & Distributors, 2010. ISBN: 978-81-7366-369-3

ONLINE RESOURCE (S):

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

COURSE OUTCOMES:

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

- get the knowledge of operating system
- understand the design issues with Operating System
- know the concept behind memory management techniques
- understand the concept behind process management
- know the concepts of file system

P1R2CACC5: MANAGEMENT INFORMATION SYSTEM

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

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

P1R2CACC6P: DATA STRUCTURES AND ALGORITHM IN C++ PRACTICAL

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

Credit : 3 **Total Inst. Hrs: 36**

1. Write a C++ program to find the area of a rectangle using class and object.

2. Write a C++ program to arrange the given numbers in ascending and descending using Class and Objects.

3. Write a C++ Program to find the sum of complex numbers using operator overloading.

4. Write a C++ Program to perform operations in strings.

5. Write a a C++ Program to perform operations singly Linked list.

6. Write a a C++ Program to perform operations Doubly Linked List.

7. Write a C++ program to perform the operations on Stack.

8. Write a C++ program to perform the operations on Queue.

9. Write a C++ program to perform traversal operation on Binary Tree.

10. Write a C++ program to find the shortest path using Dijikstra's Algorithm.

P1R2CACC7P: JAVA PROGRAMMING PRACTICAL

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

Credit : 3 **Total Inst. Hrs: 36**

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

2. Write a Java Program to Prepare a Student Mark List using Class and Objects.

3. Write a Java Program to Display a Matrix Using the concept of Array.

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. Write a Java program to create a Try Block, that is likely to generate two types of exception and incorporate necessary catch Blocks.

7. Write a Java Program Using Multi-Threading Concept.

8. Write a Java Program to Pass a Parameter Using Applet.

9. Write a Java program using applet, to change the background color with the help of three Buttons named: Red, Green, Blue.

10. Write a Java program to draw the shapes: Rectangle, Oval, Circle using graphics class.

P2R2CACC8: DATABASE MANAGEMENT SYSTEM

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

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

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

P2R2CACC9: .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

P2R2CACC10: 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

P2R2CACC11: DISCRETE MATHEMATICS

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

Credit : 4 **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

P2R2CACC12P: RDBMS PRACTICAL

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

Credit : 3 **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.

P2R2CACC13P: .NET TECHNOLOGIES PRACTICAL

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

Credit : 3 **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.

P3R2CACC14: 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

P3R2CACC15: DISTRIBUTED 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

P3R2CACC16: DATAMINING AND WAREHOUSING

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

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

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: 13)

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: 12)

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: 13)

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: 10)

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: 10)

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

P3R2CACC17: NETWORK SECURITY

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

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

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: 12)

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: 13)

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: 12)

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: 11)

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: 10)

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

P3R2CACC18P: DISTRIBUTED TECHNOLOGIES USING J2EE PRACTICAL

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

Credit : 3 **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.

P3R2CACC19P: NETWORK SECURITY PRACTICAL

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

Credit : 3 **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.

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. INTERNET OF THINGS

ELECTIVE – II (SEM III)

2:1. SOFTWARE ENGINEERING

2:2. BIG DATA ANALYTICS

2:3. MACHINE LEARNING

ELECTIVE – III (SEM IV)

3:1. SOFTWARE QUALITY ASSURANCE AND TESTING

3:2. PERVASIVE COMPUTING

3:3. CLOUD COMPUTING

P2R2CAEC1:1 - 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

P2R2CAEC1:2 - 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.

INTERNET OF THINGS

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

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

Objectives:

1. To learn about the fundamentals of IoT.
2. To understand how IoT works.
3. To gain knowledge about the difference between IoT and M2M.
4. To develop an IoT system.
5. To learn about the logical design of IoT using Python.

Unit - I : Introduction and Concepts (Inst Hrs: 12)

Introduction to Internet of Things: Definition and Characteristics of Internet of Things (IoT) - **Physical design of IoT**: - Things in IoT - IoT protocols - **logical design of IoT**: IoT functional blocks - IoT communication models - IoT communication APIs - **IoT enabling Technologies**: Wireless Sensor Networks - Cloud Computing - Big Data Analytics - Communication protocol - Embedded systems – **IoT Levels & Deployment Templates.**

Unit - II : Domain specific IoTs (Inst Hrs: 10)

Introduction: Home Automation: Smart lighting - Smart appliances - Intrusion detection - Smoke gas detectors – **Cities**: Smart parking - Smart lighting - Smart roads - Structural health monitoring - Surveillance emergency response – **Environment**: Weather monitoring - Air pollution monitoring - Noise pollution monitoring - Forest fire detection - River floods detection - **Energy**: Smart grids - Renewable energy systems – Prognostics - **Retail**: Inventory management - Smart payments - Smart vending machines – **Logistics**: Route generation and Scheduling - Fleet tracking - Shipment monitoring - Remote vehicle diagnostics – **Agriculture**: Smart irrigation - Greenhouse control – **Industry**: Machine diagnosis and Prognosis - Indoor air quality monitoring - **Health and life cycle**: Health and fitness monitoring - Wearable electronics.

Unit – III : IoT and M2M , and IoT System Management (Inst Hrs: 10)

IoT and M2M: Introduction - M2M - Difference between IoT and M2M - **SDN and NFV for IoT**: Software Defined Networking - Network Function Virtualisation. **IoT system management with NETCONF-YANG**: Need for IoT system management - Simple Network Management Protocol (SNMP) - limitations of SNMP - Network operator requirements – NETCONF – YANG - **IoT system management with NETCONF-YANG:** NETOPEER.

Unit – IV: Developing Internet of Things **(Inst Hrs: 08)**

IoT platform design methodology: Introduction - IoT design methodology: Purpose & Requirements Specification – Process Specification – Domain model Specification – Information Model Specification – Service Specification – IoT level Specification – Functional view Specification – Operational view Specification – Device and Component Integration – Application Development – Case Study on IoT System for weather monitoring – Motivation for using Python.

Unit - V: IoT systems - logical design using python **(Inst Hrs: 06)**

Introduction - Installing python - **Python data types and data structures**: Numbers, Strings, Lists, Tuples, Dictionaries, Type conversions - **Control flow**: if – for – while – range – break/continue – pass - Functions - Modules - Packages - File handling – Date/Time operations - Classes – Python Packages of Interest for IoT – **IoT Physical Devices:** Basic building blocks of an IoT Device.

Unit – VI : Latest Learning **(Inst Hrs: 02)**

Case Study: Illustrating IoT Design

Text Book:

1. Arshdeep Bahga and Vijay Madisetti, “Internet of Things: A Hands-on Approach”, Universities Press, Reprint: 2018. ISBN: 978 8173719547.

Unit – I: Chapter 1 ; Unit – II: Chapter 2 ; Unit – III : Chapter 3. 4;

Unit – IV: Chapter 5; Unit – V: Chapter 6, 7 .

REFERENCE BOOK (S):

1. Simone Cirani, Gianluigi Ferrari, Marco Picone, Luca Veltri, 1st Edition, ”Internet of Things: Architectures, Protocols and Standards”, 2019, John Wiley & Sons Ltd. ISBN: 978 11193596878.

ONLINE RESOURCE (S):

1. https://www.engineersgarage.com/?s=internet+of+things

COURSE OUTCOMES:

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

- Know the fundamentals of IoT
- Working of IoT
- difference between IoT and M2M
- Develop an IoT System
- Design of IoT

P3R2CAEC2:1 - 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

P3R2CAEC2:2 - 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.

P2R2CAEC2:3 - 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

P4R2CAEC3:1 - 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

P4R2CAEC3:2 -PERVASIVE COMPUTING

OBJECTIVE:

1. To understand the basics of pervasive computing.
2. To understand the device technology.
3. To understand the concept of device connectivity.
4. To gain the knowledge about WAP and Beyond.
5. To get the knowledge about personal digital assistant.

Unit I: Pervasive Computing

Pervasive Computing: Past, Present and Future – Pervasive Computing Market – M-Business – Application examples: Retail, Airline check-in and booking – Health care – Car information system – E-mail access via WAP and voice.

Unit II : Device Technology

Device technology : Hardware – Human machine interfaces – Biometrics – Operating Systems – Java for Pervasive devices.

Unit III : Device Connectivity

Device Connectivity : Protocols – Security – Device management – Web application concepts: WWW architecture – Protocols – Transcoding – Client authentication via internet.

Unit IV : WAP and Beyond

WAP and Beyond : Components of WAP architecture – WAP infrastructure – WAP security issues – WML – WAP push – Products – i-mode –Voice technology : Basics of speech recognition – Voice standards – Speech applications – Speech and Pervasive Computing.

Unit V: Personal Digital Assistant

PDA : Device categories – PDA operation systems – Device Characteristics – Software components – Standards – Mobile Applications – PDA Browsers – Pervasive web application architecture : Background – Development of pervasive computing web applications – Pervasive application architecture.

TEXT BOOK :

1. Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaech & Klaus Rindtorff, Pearson Education,2006.

Unit I - Chapter 1 2, Unit II - Chapter 3, Unit III Chapter 4,5 Unit IV - Chapter 6,7 Unit V Chapter 8,10

REFERENCE BOOK :

1. Fundamentals of mobile and pervasive computing, Frank Adelstein, Sandeep K S Gupta, Golden Ricard III, Loren Schwiebert, McGraw Hill edition, 2006.

P4R2CAEC3:3 - 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