Program : MCA
Course Title : Core : Object Oriented Programming with C++
Course Code : 20PCA1C01
Year : I   **Semester** : I
Hours/Week : 5   **Credits** : 4

COURSE OBJECTIVES

1. Understand object oriented programming and advanced C++ concepts
2. Be able to explain the difference between object oriented programming and procedural programming.
3. Be able to program using more advanced C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling, etc.
4. Be able to build C++ classes using appropriate encapsulation and design principles
5. Improve your problem solving skills

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Distinguish between Structured and Object Oriented problem solving approaches and apply them based on the problem given	K1
CO2	Identify classes and objects from the given problem description and able to create classes and objects using C++.	K1 & K2
CO3	Improve secured data processing by applying Abstraction, Encapsulation and Information hiding	K2
CO4	Achieve code reusability and extensibility by means of Inheritance and Polymorphism	K2
CO5	Apply the concepts of files and stream classes	K2 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L - Low

Unit - I

Principles of Object Oriented Programming – Software Evaluation – OOP Paradigm – Basic concepts of OOP – Benefits of OOP – Object Oriented languages – **Applications of OOP.**

Unit - II

Introduction to C++ - C++ Data types – Token, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control structures in C++, Functions in C++, Main function & Function Prototyping – Call by Reference – Call by Value – Return by Reference – Return by Value – Inline Functions – Friends Functions & Classes.

Unit - III

Classes and Objects: Constructors and Destructors and Operator Overloading and type conversions.

Unit - IV

Inheritance: Single Inheritance-Multilevel Inheritance –Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance. Pointer – Virtual functions and Polymorphism – Managing console I/O operations.

Unit - V

Working with Files: Classes for file stream operations – opening and closing File-End-file Detection-File pointers-updating a File error handling during file Operations- Command-line arguments. Templates and Exception Handling: Class Templates-Function Templates – Member Function Templates-Type Template Arguments – Non Type Template type arguments – Exception Handling.

Book for study:
1. E. Balagurusamy E, *Object Oriented Programming with C++,* McGraw Hill Education (India) Private Limited, New Delhi Seventh Edition-2017.

Books for reference:
1. Herbert Schildt, C++ - *The Complete Reference*, Tata McGraw Hill, 1998.
2. Paul Deitel, Harvey Deitel, *C++ How to Program*, PHI, 9 th edition, 2014
3. Ashok N.Kamthane, *Object Oriented Programming with ANSI & Turbo C ++,* Pearson Education, 2006
4. Alok Kumar Jagadev, Amiya Kumar Rath and Satchidananda Dehuri *Object-Oriented Programming Using C++,* PHI, New Delhi, 2007.

e-resources:
1. https://spoken-tutorial.org/tutorial-search/?search_foss=Advanced+Cpp&search_language=English
2. https://nptel.ac.in/courses/106/105/106105151/#
3. https://www.cplusplus.com/doc/tutorial/
4. https://www.programiz.com/cpp-programming

COURSE OBJECTIVES

1. To understand the linear and non-linear data structures available in solving problems
2. To know about the sorting and searching techniques and its efficiencies
3. To get a clear idea about the various algorithm design techniques
4. Using the data structures and algorithms in real time applications
5. Able to analyses the efficiency of algorithm

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Acquire knowledge about algorithms and algorithm correctness	K1
CO2	Apply stack, queue and linked list in real world problem	K2 & K3
CO3	Apply the knowledge of tree and graphs in real world problem	K2 & K3
CO4	Apply various searching and sorting techniques in real world problem	K3
CO5	Analyse the various algorithms to implement in real time application.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	L	M	S	M	S	M	L
CO2	S	S	S	L	M	S	M	S	M	L
CO3	S	S	S	L	M	S	M	S	M	L
CO4	S	S	S	L	M	S	M	S	M	L
CO5	S	S	S	L	M	S	M	S	M	L

S – Strong; M – Medium; L – Low

Unit - I

Arrays: Concepts – Ordered List – Sparse Matrices- **representation of arrays***. Stack and Queues: Fundamentals – **a mazing problem*** - evaluation of expressions– Multiple Stacks and Queues.

Unit - II

Linked Lists: Singly Linked List - Linked Stacks and Queues - The storage pool - Polynomial addition- More on linked lists - Equivalence relations - Spares Matrices. Doubly Linked Lists and dynamic storage management: Doubly linked lists - **Dynamic Storage Management –Generalized list - Garbage Collection and Compaction***.

Unit - III

Trees: Basic Terminology - Binary Trees - Binary Tree Representations - Binary Tree Traversal –More on binary trees - Threaded Binary Trees – Binary Tree representation of trees - **Application of Trees: Set representation – Decision trees***.

Graphs: Terminology and Representations – Traversal - **Connected Components and Spanning Trees*** - Shortest Paths – Transitive Closure.

Unit - IV

Internal sorting: Insertion Sort – Quick sort – Merge Sort - Heaps sort**]** External Sorting: Storage Devices - **Sorting with Disks – Sorting with Tapes***

Symbol tables: Static Tree tables – **Dynamic Tree Tables*** – Hash Tables.

Unit - V

Files: Files, Queries & sequential Organizations. Index Techniques: Cylinder-Surface Indexing – Hashed Indexes – Tree Indexing – B trees. File Organizations: Sequential Organization (ISAM)- **Random File Organization – Linked Organization –Inverted Files – Cellular Partitions – Storage Management***.

Book for study

1. Ellis Horowitz and Sartaj Sahni, *"Fundamentals of Data Structures in C++"*, **Universities Press**, 2008.

Books for reference

1. Tanenbaum A. M. and Augestine M. J., *"Data Structures Using Pascal"*, Prentice hall, 2nd edition, 1996.
2. Yashwant Kanetkar, *"Data Structures through C"*, BPB publication, 2nd edition, 2003.
3. Sartaj Sahni, "Data Structures, Algorithms & Applications in C++". McGraw-Hill, First Edition, 1998.
4. Samuktha, *"Data and File Structures"*, Addison Wesley, 1999.

e-resources:

1. https://www.javatpoint.com/data-structure-tutorial.
2. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
3. https://www.programiz.com/dsa
4. https://www.youtube.com/watch?v=RBSGKlAvoiM

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Program : MCA
Course Title : Core: Relational Database Management System
Course Code : 20PCA1C03
Year : I   **Semester** : I
 Hours/Week : 4   **Credits** : 4

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COURSE OBJECTIVES

1. Learn and practice data modelling using the entity relationship and modelling database designs
2. Understand the use of structured query language and learn SQL syntax
3. Apply normalization techniques to normalize the database.
4. To get a clear idea about Object-Relational Databases
5. To understand the PL/SQL Function and Database Triggers

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Ability to describe data models and schemas in DBMS	K1
CO2	Understanding the Features of database management systems and Relational database	K1 &K2
CO3	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.	K1 &K2
CO4	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.	K2& K3
CO5	Ability to understand the functional dependencies and design of the database and PL/SQL	K1 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	M	M	S	L	M	S	M	M
CO2	M	M	M	M	S	S	M	M	M	M
CO3	L	M	M	S	M	M	L	M	M	M
CO4	S	M	M	M	M	M	M	S	M	S

S – Strong; M – Medium; L – Low

Unit - I

Introduction to Database Systems - Purpose of Database Systems - View of Data - Data Models - Database Languages - Transaction Management - Storage Management - Database Administrator - Database Users – Overall System Structure.

Entity-Relationship Model - Basic Concepts - Design Issues - Mapping Constraints - Keys - Entity Relationship Diagram - Weak Entity Sets - Design of an E-R Database Schema - Reduction of an E-R Schema to Tables.

Unit - II

Relational Model - Structure of Relational Databases - The Relational Algebra - The Relational Calculus - Extended Relational Algebra Operations -Modification of the Database - Views.

Relational Database Design - Pitfalls in Relational Database Design- Decomposition - Normalization Using Functional Dependencies - Normalization Using Multi valued Dependencies - Normalization Using Join Dependencies.

Unit - III

Distributed Database Systems: Introduction – Distributed DBMS Architecture: DBMS standardization – Achitectural Models fro Distributed DBMS's – Distributed DBMS Architecture - Distributed Database Design: Distribution Design Issues– Query Decomposition and Data Localization– Introduction to Transaction Management

Unit - IV

Object-Oriented Databases - The Object-Oriented Data Model - Object-Oriented Languages - Persistent Programming Languages - Persistent C++ Systems

Object-Relational Databases - Nested Relations - Complex Types and Object Orientation - Querying with Complex Types - Creation of Complex Values and Objects - Comparison of Object-Oriented and Object-Relational Databases

Unit - V

ORACLE 9i – Introduction - oracle data types – Create table command- Viewing data in tables – Eliminating Duplicate rows , Sorting data, Create a table from a table, delete operations - Update, Modify ,Rename, Truncate, Destroying tables- Oracle Functions: Aggregate functions (Group)- Single Row functions (Scalar): String , Numeric , Conversion, Date Functions– sub queries (– indexes – views - clusters– sequences

Introduction to PL/SQL – PL/SQL Block – Control structures-Cursors – Exception handling– Procedures, Functions, Database Triggers, Types of Triggers

Books for study:

1. A.Silberschatz, H.Korth and S.Sudarsan," *Database System Concepts*",7thEdition**,**TATA McGraw Hill Inc., 2019
2. M.Tamer Ozsu Patrick Valduriez, "*Distributed database Systems*",3nd Edition, Pearl Education, **2010**.
3. Ivan Bayross,"*SQL, PL/SQL The Programming Language of Oracle*"4nd Edition BPB Publications, 2020.

Books for reference:
1. Bipin.C.Desai,” *An Introduction to Databse System*”,West Publishing Company , 2002.
2. C.J.Date,” *An Introduction to Database Systems*”,Addision-Wesley,2002.
3. Raghu Ramakrishnan,”*Database Management System*”, McGraw Hill Inc.,2000.
4. R. Elmasri and S.B.Navathe,”*Fundamentals of Database Systems*”The Benjamin Cummings publishing Company Inc, 2002.

e-resources:

1. https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm
2. https://nptel.ac.in/courses/106/105/106105175/

Program   : MCA
Course Title : Core Practical: C++ programming   **Course Code** : 20PCA1CP1
Year   : I   **Semester**   : I
Hours/Week : 4   **Credits**   : 3

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COURSE OBJECTIVES
1. To develop simple programs using class.
2. To develop simple C++ programs for solving mathematical problems.
3. To develop C++ programs by incorporating OOPS concepts.
4. To Execute the problems in real time applications.
5. Implement several programs in C++ language other than the one emphasized in the curriculum.

COURSE OUTCOMES
After learning the course, the students will able to

CO1	write a simple program using class.	K1 & K2
CO2	develop programs to solve mathematical problems	K2 &K3
CO3	capable of developing programs using OOP concepts.	K2
CO4	execute programs using pointers using virtual functions.	K3 & K4
CO5	develop programs to real time applications	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S->Strong, M->Medium, L->Low

1. Write a C++ program for Conversion of ID array into all possible 2 D array.
2. Write a C++ program to express a given number as a product of primes.
3. Write a C++ program to find the maximum and minimum element in each of a m*n matrix and its position.
4. Write a C++ program for matrices multiplication, addition and subtraction.
5. Write a C++ program for multiplying to Matrices and multiplying a matrix with a constant using function overloading.
6. Write a C++ program for complex numbers arithmetic using functions.
7. Write a C++ program for complex numbers arithmetic using operator overloading.
8. Write a C++ program to convert the given 2 set of times calculated as day, hour, minutes and seconds.
9. Write a C++ program to count number of working days with day and dates in calendar.
10. Write a C++ program for Binary Search.

11. Write a C++ program for Correlation.

12. Write a C++ program for Regression.

13. Write a C++ program for Variance, Standard and Mean Deviations.

14. Write a C++ program for String concatenation using Dynamic Constructors

15. Write a C++ program to add two polynomials.

16. Write a C++ program to multiply to polynomials.

17. Write a C++ program for Sorting using Templates.

18. Write a C++ program for Count Vowels, constants, numbers and special characters in a given file.

Program : MCA
Course Title : Core:Practical: Data Structures using C++ **Course Code** : 20PCA1CP2
Year : I **Semester** : I
Hours/Week : 4 **Credits** : 3

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COURSE OBJECTIVES

1. To impart the concept of linear data structure(Array, Stack and Queue)
2. To understand the concept of pointers for writing singly linked list and doubly linked list programs
3. To understand basics of searching and sorting techniques
4. To get a clear idea about the various algorithm design techniques.
5. Using the data structures and algorithms in real time applications.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	acquire knowledge about algorithms and algorithm correctness	K1
CO2	apply stack, queue and linked list in real world problem	K2 & K3
CO3	apply the knowledge of tree and graphs in real world problem	K2 & K3
CO4	apply various searching and sorting techniques in real world problem	K3
CO5	analyse the various algorithms to implement in real time application.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	L	M	S	M	S	M	L
CO2	S	S	S	L	M	S	M	S	M	L
CO3	S	S	S	L	M	S	M	S	M	L
CO4	S	S	S	L	M	S	M	S	M	L
CO5	S	S	S	L	M	S	M	S	M	L

S – Strong; M – Medium; L – Low

LIST OF PRACTICALS

1. Implementation of Arrays
   Polynomial addition
   Magic Square
2. Stack operation (PUSH & POP)
   Application of Stack
   Evaluation of Expression
3. Infix to postfix
4. Queue operation (ADD & DELETE)
5. Circular queue (ADD & DELETE)
6. Single linked list (CREATION,ADD,DELETE,SEARCH,SORT)
7. Circular linked list
8. Dynamic circular linked list
9. Tree (CREATION,ADD,DELETE,SEARCH)
10. Tree Traversals(apply infix, postfix, prefix)
11. Binary trees(CREATION,ADD,DELETE,SEARCH)
12. Searching(Sequential search, Binary search)
13. Sorting(Insertion sort, Bubble sort, quick sort, merge sort heap sort)

Program : MCA
Course Title : Core Practical: Relational Database Management System
Course Code : 20PCA1CP3
Year : I   **Semester** : I
Hours/Week : 4   **Credits** : 3

COURSE OBJECTIVES

14. To impart the basic concepts of DDL, DML commands
15. Understand the use of SQL, SQL syntax, data base design and the E-R model
16. Apply normalization techniques to normalize the database
17. Understand, remembers the concept of storage and file structure, indexing and hashing
18. Understand transaction concepts and various concurrency control protocols

COURSE OUTCOMES

After learning the course, the students will able to

CO1	perform DDL, DML commands in a database	K1
CO2	have knowledge about various operations like set operations, relational and logical operations	K1
CO3	understand the PL/SQL structure and operations	K2
CO4	apply PL/SQL concepts to solve real time problems.	K2
CO5	develop the skill to implement database for a given problem for data retrieval.	K2 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	S	S	S	M	M	S	S
CO2	S	M	S	M	M	S	S	M	S	M
CO3	S	S	M	S	M	S	S	M	M	S
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	M	M	M	M	S	M	S	S	M

S->Strong, M->Medium, L->Low

1. Exploring the Simple queries with DDL Commands using SQL.
2. Exploring the Simple queries with DML Commands using SQL.
3. Exploring the Comparison (relational) operator and Logical operator using SQL.
4. Exploring the Set operations and sorting and grouping operator using SQL.
5. Exploring the built-in functions i) Count Function ii) Character Function using SQL.
6. Exploring the built-in functions i) Number Function ii) Date function using SQL.
7. Create a student table contains reg-no, stud-name, class, subjects to perform an Aggregate operations using SQL.
8. Create a table PASSENGER with the fields Ticket no (Primary Key), name, age, gender and fare. Write a PL/SQL procedure to print the details of all the passenger, name, age, gender and fare.
9. Write a PL/SQL recursive functions for finding Factorial Series for the given no of terms.

10. Write a PL/SQL recursive functions for Generating Fibonacci Series for the given no.
11. Write PL/SQL statements to perform arithmetic operations.
12. Write a PL/SQL statements to print "n" numbers using while loop / For loop.
13. Write a PL/SQL code to calculate the area of a circle.
14. Create a function to return a fare from tickets booking table which contains bus_code, origin, fare, destinations, time of departure, data of travelling.
15. Create a function to return a current stock value for a given product.

Program : MCA
Course Title : Core :Web Programming (PHP& MySQL)**Course Code** : 20PCA2C05
Year : I   **Semester** : II
 Hours/Week : 5   **Credits** : 4

COURSE OBJECTIVES
   1. Understand about Server Sided Scripting language in PHP & MySql.
   2. Understand the working with databases and SQL
   3. Understand the needs of AJAX script in web programming languages in PHP.
   4. Understand the needs of JQuery in web programming.
   5. Understanding the concept of MVC framework using YII in PHP.

COURSE OUTCOMES
        After learning the course, the students will able to

CO1	understanding the concept of Server Side Scripting language PHP and MySql. Ability to write code in PHP and save the data into the MySql database Table.	K2
CO2	understand database application in PHP & MySql	K2
CO3	understand the functional dependencies of AJAX in PHP.	K1 & K2
CO4	understand the needs of JQuery in PHP.	K2
CO5	understand about MVC framework using YII in PHP.	K2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	M	M	S	S	M	M	M	L	M	M
CO2	M	M	S	M	M	M	M	M	M	L
CO3	M	M	S	S	M	L	L	M	M	M
CO4	M	L	M	M	S	M	L	S	S	M
CO5	M	M	S	S	M	M	M	L	M	M

S - Strong; M – Medium; L - Low

Unit I
    Introducing PHP – Using Variables and Operators– Controlling program flow – Working with cookies, sessions and headers

Unit II
    Working with arrays– Using functions and classes– Working with files and directories– Working with databases and SQL

Unit III

Getting started with Ajax– Writing Ajax– Creating and Opening XMLHttpRequest object– Handling & Starting the Downloaded data– Ajax with Some PHP (448) – Passing Data to the Server with GET & POST

Unit IV

Introduction to JQuery– Element getters and setters– Altering document structure– Events and Animated Effects– Ajax and Utility functions– JQuery with plugins.

Unit V

Meet Yii– Getting started– Creating the initial trackstar application – Project CRUD – Adding Tasks – User management and authentication .

Books for study:
1. Vikram Vaswani, "*A Beginner's Guide PHP*", 1st Edition, Tata McGraw Hill, 2008.
2. Steven Holzner, "*PHP Complete Reference*", Tata McGraw Hill Edition, 2008.
3. David Flanagan and ORelly, "*JQuery Pocket Reference*", 1st Edition, 2011.
4. Jen Kramer, "*Joomla! Start to Finish*", John Wiley & Sons, 2010.
5. Jeffrey Winesett," *Web Application Development with Yii and PHP*", 2nd Edition, Packt Publishing Ltd, 2012.

Books for reference:
1. Jeremy Allen and Charles Hornberger, "*Mastering PHP 4.1*", 2002, BPB Publications, New Delhi.
2. Meloni Julie C, SAMS Teach Yourself PHP,"*MySQL and Apache*", 2006, Dorling Kindersely (India) Pvt. Ltd., New Delhi.

e-resources:
1. https://www.w3schools.com/php/DEFAULT.asp
2. https://www.tutorialspoint.com/php/index.htm
3. https://www.javatpoint.com/jquery-tutorial
4. https://www.tutorialspoint.com/joomla/index.htm

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Program   **:** MCA
Course Title **:** Core :Computer Networks   **Course Code** : 20PCA2C06
Year   **:** I   **Semester**   **:**II
 Hours/Week : 5   **Credits**   **:** 4

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COURSE OBJECTIVES
1. To make aware about the structure, functions, components, and models of the computer networks.
2. To Understand details about address structure and rounding
3. Describe the importance of IP addressing and design, calculate, and apply subnet masks and addresses to fulfil given requirements in IPv4 and IPv6 networks
4. To understand design a scalable hierarchical network, Configure and troubleshooting, VLAN and inter-VLAN routing
5. To Acquire knowledge of various protocol LACP, PAgP and Access Control List and NAT

COURSE OUTCOMES
After learning the course, the students will able to

CO1	understand the concepts of functions, components, and models of the computer networks	K2
CO2	Understanding the concepts of IP addressing and subnetting calculation	K2 & K3
CO3	Identify the different types of routing protocols and metrics	K1
CO4	Understand the functionalities of VLAN and inter-VLAN routing	K2 & K3
CO5	Apply Packet Tracer tool to implement advanced Networking Concept	K3 & K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5		PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	L	M		M	M	L	M	M
CO2	S	M	S	L	M		S	S	L	M	M
CO3	S	S	S	L	M		S	M	L	M	L
CO4	S	S	S	L	M		S	M	L	M	L
CO5	M	S	S	M	M		S	M	L	M	M

S - Strong; M – Medium; L - Low

Unit – I

Introduction: The use of computer networks - Network architectures -Components of the Network **-** Types of Networks - **Transmission Media:** Classification of transmission media -**Overview of TCP / IP & OSI:** benefits of a Layered Model – TCP/IP Model – OSI Model – Comparing the TCP/IP & OSI Model- Application layer Services and Protocols Function- Transport Layer Protocols: TCP and UDP – Port Addressing.

Unit – II

Address Structure: IPv4 Address Structure- IPv6 Address Structure- Subnetting- Subnet of Subnet- NAT - Public and Private Address –MAC Address Structure

Unit III

Routing : Static Routing : IPv4 & IPv6 - Configuring Static routes - Summarizing Routes - Dynamic routing : RIP & RIPng configuration –EIGRPv2 & EIGRPv3 configuration- -Single Area OSPF configuration - Multi Area OSPF configuration – OSPFv3 Configuration

Unit IV

Switching : Introduction - LAN Design – VTP configuration -VLAN: types - benefits - Configuration -Inter-VLAN: features- types - traditional -router on a stick - Using multilayer switch –STP Configuration

Unit V

Ether channel: Advantage- LACP configuration -PAgP Configuration **-** ACL: Purpose - types -Standard ACL Configuration - Extended ACL configuration –Static NAT- Dynamic NAT.

Books for study:
1. Todd Lammle -*CCNA Routing and Switching Complete Study Guide*, John Wiley & Sons, 2nd Edition, 2016
2. Cisco Networking Academy, *CCNA 1 and 2 Companion Guide*, Pearson Education, Third Edition, 2003.

Books for reference:
1. Cisco Networking Academy, *CCNA 3 and 4 Companion Guide*, Pearson Education, Third Edition, 2003.

e-resources:
1. https://www.netacad.com/group/resources/ccna-rs-scaling/6.0
2. https://www.netacad.com/group/resources/ccna-rs-connect/6.0

Program **:** MCA
Course Title **:** Core :Open Source Application Development - Advanced Java-I
Course Code : 20PCA2C07
Year **:** I   **Semester** **:**II
Hours/Week : 4   **Credits** **:** 4

COURSE OBJECTIVES
1. To enable students to learn about the basic features of java programming
2. To learn how to program using .net package
3. To develop the basic applications using event handling
4. To make them understand the applet class, and frame.
5. To develop the advanced level of JavaFX.

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea to create java applications	K1 & K2
CO2	Understand the concepts of applet class , event handling, and Image	K2 &K3
CO3	Understand then java networking	K2 & K3
CO4	Apply the concepts to solve real-time advanced java applications	K4
CO5	Understand the concepts of swing and Java FX	K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	S	M	S	S	S	M	S
CO2	S	S	S	S	M	S	S	M	M	S
CO3	S	S	M	S	M	S	M	M	M	M
CO4	S	S	M	S	M	S	M	M	M	M
CO5	S	S	S	S	M	S	S	M	M	M

S - Strong; M – Medium; L - Low

UNIT-I

An Overview of Java -Introducing Classes-Declaring Objects-Methods-Constructors -Inheritance-Packages and Interfaces-Exception Handling-Multithreaded-I/O Basics-**String Handling:** String Constructors-Special String Operations-Character Extraction-String Comparison

UNIT-II

Networking Basics-Networking Classes and Interfaces-InetAddress-TCP/IP Client Sockets-URL-Datagrams-The Applet Class: Applet Basics-Applet Skeleton-Requesting Repainting-HTML APPLET Tag-Passing Parameters to Applets- JDBC: Creating, deleting, updating the table by the console and Applet with AWT program

UNIT-III

Event Handling-Event Classes-Window Fundamentals-Working with Frame Windows-Creating a Frame Window in an AWT-Graphics-Working with Color-Working with Fonts

UNIT-IV

AWT Control Fundamentals-Buttons-Check Boxes-Choice Controls-Lists-Managing Scroll Bars-TextField-Understanding Layout Managers- **Images:**Image Fundamentals: Creating, Loading, and Displaying

Unit-V

Introducing GUI Programming with Swing: Introducing Swing-Two Key Swing Features-Components and Containers-Painting in Swing-Exploring Swing- wing Buttons- Swing Menus-Create a Main Menu -**Introducing GUI Programming with JavaFX:** Introducing JavaFX GUI Programming-JavaFX Basic Concepts-Using Buttons and Events

Book for study:
1. Herbert Schildt " *The Complete Reference Java*", Eleventh Edition ,TATA McGraw Hill, 2019 .

Books for reference:

1. Herbert Schildt **"** *The Complete Reference-Java 2*" 5th Edition ,TATA McGraw Hill,2002
2. Joshua Bloch ,"*Effective Java* "3th Edition, Addison Wesley,2018.

e-resources:

1. https://nptel.ac.in/courses/106/105/106105191/
2. https://www.w3schools.com/java/
3. https://www.javatpoint.com/java-tutorial
4. https://go.java/

Program   : MCA
Course Title : Core Practical :Web Programming (PHP& MySQL)
Course Code : 20PCA2CP4
Year   : I   **Semester   : II**
Hours/Week : 4   **Credits   : 3**

COURSE OBJECTIVES

1. Understand about Server Sided Scripting language in PHP & MySql.
2. Understand the needs of AJAX script in web programming languages in PHP.
3. Understand the needs of JQuery in web programming.
4. Understand the web applications
5. Understanding the concept of MVC framework using YII in PHP.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Understanding the concept of Server Side Scripting language PHP and MySql. Ability to write code in PHP and save the data into the MySql database Table.	K2
CO2	Ability to understand the functional dependencies of AJAX in PHP.	K1 & K2
CO3	Ability to understand the needs of JQuery in PHP.	K2
CO4	Ability to understand about MVC framework using YII in PHP.	K2
CO5	Ability to understand about web applications	K3 & K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5		PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	M		M	M	S	M	M
CO2	M	S	S	M	M		M	M	M	S	L
CO3	M	M	S	L	M		L	L	M	M	M
CO4	M	L	M	M	S		M	L	S	S	M
CO5	M	L	M	S	M		M	L	S	S	M

S - Strong; M – Medium; L – Low

1. Create an application to display student's details in a table using PHP
2. Create an application to display bus route using PHP.
3. Display the details of employees using PHP.
4. Display the course table using PHP.
5. Create an application to list the books in the library using php.
6. Create a login page using PHP.
7. Create an application form for a college using PHP.
8. Create an application form for a school using PHP.
9. Create a form to apply for voter ID using PHP

10. Create an application form to apply for driving license.
11. Design a form to create an email ID using PHP with the validation of mandatory field.
12. Design a form to reserve railway ticket with the validation of mandatory fields.
13. Design a form to reserve air ticket with the validation of mandatory fields.
14. Create an application form for Pan Card using PHP.
15. Create an application for bank using YII Framework in PHP.

Program   **:** MCA
Course Title **:** Core Practical :Open Source Application Development - Advanced Java-I
Course Code : 20PCA2CP5
Year   **:** II   **Semester**   **:** II
 Hours/Week : 4   **Credits**   **:** 3

COURSE OBJECTIVES

1. To be familiar with programming in java Language
2. To understand various programs using package and interface
3. To develop the basic applications using event handling
4. To make them understand the applet class, and frame.
5. To develop the advanced level of JavaFX.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic idea to create java applications	K1
CO2	Understand the concepts of applet class , event handling, and Image	K3
CO3	Understand various programs using package and interface	K2 & K3
CO4	Apply the concepts to solve real-time advanced java applications	K4
CO5	Understand the concepts of swing and Java FX	K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	S	S
CO2	S	M	S	M	M	S	S	M	L	M
CO3	S	S	S	S	M	S	S	M	M	L
CO4	S	S	S	S	M	S	S	S	M	M
CO5	S	M	M	M	M	S	M	S	S	M

S->Strong, M->Medium, L->Low

1. Write a Java program to maintain the Stack by applying interface.

2. Write a Java program to Multiple Inheritance by using interface concept.

3. Write a Java program to get your name, age, class from one package and also get your college name address from other package in some other directory. To import these to packages into one main method.

4. Write a Java program to implement the Inheritance concept with suitable example by the Super class.

5. Write a Java program with one string message in one machine, to display this string to some other machine in the Java client program by the TCP/IP transmission in the Networking.

6. Write a Java applet program to create the table then adding and deleting the records to and from that table by JDBC

7. Develop a Java program for creating Menu containing various necessary items.

8. Write a applet program to display number of options but choose only one option and print that option by Item Listener.

9. Develop a Java program to create your details like name, age and class by using Actionlistener and Text Area.

10. Write a Java program to image creating, loading, and displaying using applet

11. Write a Java swing program to handle an event in as swing program

12. Write a java swing program to display simple main menu. .

13. Write a Java program to create a icon-based JButton using java swing .

14. Write a JavaFX application program to Load and display an image using image view.

15. Write a program to create Menus using JavaFX.

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Program   **:** MCA
Course Title **:** Core :Windows Application Development - C#.NET
Course Code **:** 20PCA3C08
Year   **:** II   **Semester**   **:** III
Hours/Week : 5   **Credits**   **:** 4
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COURSE OBJECTIVES
1. To make the students aware of the basic concepts of C#.Net 2010.
2. To understand the concept of Control Statements, Arrays and Delegates.
3. To understand the concept of OOPS and GUI with Windows Forms.
4. To understand the benefits of using ADO.Net in C#.
5. To understand the Visual Studio.Net

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea about C#.Net 2010.	K2
CO2	Understand the concepts of Control Statements, Arrays and Delegates.	K1 & K2
CO3	Understand the Object Oriented Programming in C#	K2
CO4	Understand the OOPS concept and GUI with Windows Forms	K2 & K3
CO5	Apply the concepts and develop programs to solve real-time ADO.Net C# Windows Applications	K3 & K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	L	M	M	M	L	L
CO2	M	M	M	L	M	M	L	M	M	M
CO3	S	M	S	M	M	S	S	S	M	M
CO4	S	S	S	S	M	S	S	S	M	M

S- Strong; M-Medium; L-Low

Unit I
Introduction– Dive into Visual C# 2010 Express– Introduction to C# Applications – Introduction to Classes and Objects

Unit II
Control Statements: Part I– Control Statements: Part II– Methods: A Deeper Look– Arrays – Garbage Collection and Destructors, Static Class Members– Delegates, Lambda Expressions, Anonymous Types.

Unit III

Object Oriented Programming: Inheritance– OOP: Polymorphism, Interfaces and Operator Overloading – Exception Handling - Introduction to LINQ and the List Collection– Graphical User Interfaces with Windows Forms: Part 1

Unit IV

Graphical User Interfaces with Windows Forms: Part 2– Database and LINQ – Generics– Collections– GUI with Windows Presentation Foundation.

Unit V

Data Access with .NET ADO.NET Overview– Using Database Connections– Fast Data Access: The Data Reader – Managing Data and Relationships: The DataSet Class – Populating a DataSet – Persisting DataSet Changes – Working with ADO.NET– The DataGrid Control– Data Binding – Visual Studio.Net and Data Access.

Books for study:

1. Paul Deitel and Harvey Deitel, "*C# 2010 for Programmers",* 4th Edition, Pearson, 2011.
2. Simon Robinson, Christian Nagel, Karli Watson, Jay Glynn, *"Professional C# "*, 3rd Edition, Wrox Publisher, 2007.

Books for reference

1. Geetanjali Arora , Balasubramaniam Aiswamy ,and Nitin Pandey," *Microsoft C# Professional Projects",* Prentice Hall of India Private Limited, 2002.
2. Herbert Schildt," *C# 4.0 Complete References"*, 1st Edition, Tata McGraw-Hill, 2010.

e-resources:

1. https://www.tutorialsteacher.com/csharp/csharp-tutorials
2. https://www.w3schools.com/cs/index.php
3. https://dotnettutorials.net/course/csharp-dot-net-tutorials/

Program : MCA
Course Title : Core: Data Science Using R
Course Code : 20PCA3C09
Year : II   **Semester : III**
Hours/Week : 5   **Credits : 4**

COURSE OBJECTIVES
1. To make aware of the basic concept R language
2. To understand the concept of introduction to R data interfaces
3. To develop the Data analytics using R
4. To Understand the charts & graphs
5. To Understand data analytics using R

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic concepts and properties of R Language	K1
CO2	Connecting different data interfaces Using R Language	K2
CO3	Developing a skill for writing a program on statistical concepts using R	K2 & K4
CO4	Statistics being applied on Data using R to understand the hidden information on Data	K4
CO5	Apply statistics on Data to develop skill to do Data Analytics	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	S	M	S	S	S	M	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	M	M	M	M
CO4	S	S	M	S	S	S	S	S	M	S
CO5	S	S	S	S	M	S	S	M	M	M

S->Strong, M->Medium, L->Low

Unit-I

Overview of R-Local Environment Setup- Basic Syntax- Data Types- Variables-Operators- Decision making- Loops-Functions-Strings-Vectors-Lists-Matrices- Arrays-Factors-Data Frames- Packages- Data Reshaping

Unit-II

R Data Interfaces : Pie Charts-Excel File-Binary Files-XML Files-JSON Files-Web Data-Databases

Unit-III

Charts & Graphs :- Pie Charts-Bar Charts - Boxplots-Histograms- Line Graphs-Scatterplots-R Statistics Examples:-Mean, Median and Mode-Linear Regression-Multiple Regression-Logistic Regression

Unit-IV

Normal Distribution-Binomial Distribution-Poisson Regression-- Analysis of Covariance-Time Series Analysis-Nonlinear Least Square-Decision Tree-Random Forest-Survival Analysis-Chi Square Test

Unit-V

Data analytics -Numpy -Data analysis pandas - Data Visualization with matplotlib- Data visualization with seaborn -Introduction to deep learning

Book for study:

1. Roger D. Peng ,*R Programming for Data Science* , Lean Publishing, 2015

Books for reference:
1. Michael J. Crawley, *The R Book*, John Wiley & Sons, 2007
2. Garrett Grolemund and Hadley Wickham ,*R for Data Science,* Originally published, December 2016

e-resources:

1. https://www.tutorialspoint.com/
2. https://www.w3schools.com/r/
3. https://www.guru99.com/r-tutorial.html

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Program **:** MCA
Course Title : Core Practical - Windows Application Development with C#.NET
Course Code : 20PCA3CP7
Year **:** II | **Semester** **:** III
Hours/Week : 5 | **Credits** **:** 4

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COURSE OBJECTIVES
1. To make the students aware of the basic concepts of C#.Net 2010.
2. To understand the concept of Control Statements, Arrays and Delegates.
3. To understand the concept of OOPS and GUI with Windows Forms.
4. To understand the benefits of using ADO.Net in C#.
5. To understand the Visual Studio.Net

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea about C#.Net 2010.	K2
CO2	Understand the concepts of Control Statements, Arrays and Delegates.	K1 & K2
CO3	Understand the Object Oriented Programming in C#	K2
CO4	Understand the OOPS concept and GUI with Windows Forms	K2 & K3
CO5	Apply the concepts and develop programs to solve real-time ADO.Net C# Windows Applications	K3 & K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	L	M	M	M	L	L
CO2	M	M	M	L	M	M	L	M	M	M
CO3	S	M	S	M	M	S	S	S	M	M
CO4	S	S	S	S	M	S	S	S	M	M

S- Strong; M-Medium; L-Low

1. Write a C# Console Program to perform palindrome.
2. Write a C# Console Program to perform command line argument.
3. Write a C# Console Program to perform simple calculator.
4. Write a C# Console Program to perform string functions.
5. Write a C# Console Program to find second largest number.
6. Write a C# Console Program to jagged array.
7. Simple Math Calculator with Memory
8. Write a C# Program to create a calculator using textbox and buttons.
9. Create a MS Windows Notepad Application with Menus and ToolBar
10. Create a MS Windows Word Pad Application
11. Creating a Windows Explorer
12. Creating an Image List View based Album
13. Working with File Saving and Opening Features in Notepad

14. Write a C# program to create a sample inventory application for a hostel and store with Transactions
15. Write a C# program to create a sample application for student progress card
16. Write a C# program to create employee details with save, view, delete and modify option.

Program **:** MCA
Course Title **:** Core Practical -Data Science using R
Course Code : 20PCA3CP8
Year **:** III   **Semester** **:** III
Hours/Week : 4   **Credits** **:** 3

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COURSE OBJECTIVES

1. To make aware of the basic concept R language
2. To understand the concept of introduction to R data interfaces
3. To develop the Data analytics using R
4. To Understand the charts & graphs
5. To Understand data analytics using R

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic concepts and properties of R Language	K1
CO2	Connecting different data interfaces Using R Language	K2
CO3	Developing a skill for writing a program on statistical concepts using R	K2 & K4
CO4	Statistics being applied on Data using R to understand the hidden information on Data	K4
CO5	Apply statistics on Data to develop skill to do Data Analytics	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	S	M	S	S	S	M	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	M	M	M	M
CO4	S	S	M	S	S	S	S	S	M	S
CO5	S	S	S	S	M	S	S	M	M	M

S->Strong, M->Medium, L->Low

1. Write a R language using data frames.
2. Write a R language using built-in function
3. To Create a matrix taking a vector of numbers as input using R
4. Write a R language we can join multiple vectors to create a data frame using the cbind()function. Also we can merge two data frames using rbind() function.
5. Write a R language using detting and setting the working directory
6. Write a R language verify and load the "xlsx" package
7. Write a R language for simple pie-chart is created using just the input vector and labels
8. Write a R language using boxplot with notch
9. Write a R language using mean, median and mode

10. Write a R language program using linear regression
11. Write a R language program using multiple regression
12. Write a R language program using logistic regression
13. Write a R language program using normal distribution
14. Write a R language program using binomial distribution
15. Write a R language program using poisson regression

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program : MCA
Course Title : Elective : Software Engineering
Year : I
Hours/Week : 4

Course Code : 20PCA2EA1
Semester :II
Credits : 4

COURSE OBJECTIVES

1. Remembers and understand software the nature of software , software process and software engineering practice and Analyse& Evaluate the various models
2. Understand the requirements, analyze and apply the various requirement models
3. Understand the design concepts, analyze and apply the concepts to design architectural, component level & User interface models. Remember and understand the golden rules.
4. Understand the quality concepts, Software Quality Assurance tasks, discuss the strategies of testing, explain the types of testing.
5. Understand the Product, process & project metrics, Analyse the estimation modeling, understand the emerging trends, Apply the software concepts to do project.

COURSE OUTCOMES

On After learning the course, the students will able to

CO1	Define software, explain the nature of software , software process and software engineering practice, explain and compare the various models	K1
CO2	Discuss the requirements, analyze and design the various requirement models	K2 & K4
CO3	Explain the design concepts, analyze and apply the concepts to design architectural, component level & User interface models, list the golden rules.	K1 & K4
CO4	Explain the quality concepts, Software Quality Assurance tasks, discuss the strategies of testing, explain the types of testing.	K2 & K3
CO5	Explain the Product, process & project metrics, discuss the estimation modeling, understand the emerging trends, Prepare a Product.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	M	L	M	M	S	M	L
CO2	S	M	M	M	L	S	M	S	L	L
CO3	S	M	S	S	L	S	S	M	M	L
CO4	S	M	S	S	L	S	S	L	L	L

S - Strong; M – Medium; L – Low

Unit - I

The Evolving role of software – software – Legacy software – software Myths – Software Engineering - A Layered Technology – A process framework – Personal and Team process Models

Unit - II

Linear sequential Models – Software Process Model – Evolutionary Process Model – Computer Based System – The System Engineering Hierarchy – System Modeling.

Unit - III

Requirement Engineering Tasks – Developing Use-Cases – Building the analysis Model - Negotiating Requirements – Validating Requirements Requirement Analysis – Data Modeling Concepts – Object Oriented Analysis**.**

Unit - IV

Design Concepts – The Design Model - Pattern Based software design – Architectural styles and Patterns – Architectural Design – Mapping Dataflow into a software architecture.

Unit - V

A Strategic Approach to software Testing – The strategies for conventional software – Validation Testing – System Testing – Software Testing Fundamentals – Basis Path Testing – control structure testing - Block Box Testing-Case studies.

TEXT BOOKS:
1. Roger S.Pressman" Software Engineering A Practitioner's Approach ",6th Edition.

REFERENCE BOOKS:
1. Peter A.N.G.& Reymond T. Yen ,"Modern Software Engineering", Van Nostrand,1990.
2. Staff, Ted J.Alan J.PAulim ,"Software Reusability", Acadmic press**,** 1989.

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

For candidates admitted from academic year 2020-2021 onwards under New CBCS.

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Program : MCA
Course Title : Elective : Dreamweaver, Wordpress and Joomla **Course Code :** 20PCA2EB1
Year : I **Semester** : II
Hours/Week : 4 **Credits** : 4

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1. To make aware of the basic concept Dreamweaver
2. To understand the concept of introduction to Wordpress
3. To understand the concept of introduction to Joomla
4. To understand the performance and security for Joomla
5. To understand design patterns and Joomla

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic idea to create Dreamweaver applications	K1
CO2	Understand the concepts of WordPress	K1
CO3	Understand design patterns and Joomla	K2 & K3
CO4	Understand the concepts Joomla	K3
CO5	Apply the concepts to solve real-time web applications	K2 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	S	L	S	S	M	M	L
CO2	S	M	S	M	L	S	S	S	L	S
CO3	S	M	S	S	S	S	S	M	M	M
CO4	S	S	M	S	S	S	M	S	S	S
CO5	S	M	M	M	L	S	M	L	L	L

S - Strong; M – Medium; L – Low

Unit I
Introducing Dreamweaver 8 - Accessing the Code Directly - Building Style Sheet Web Pages - Working with Text - Inserting Images - Establishing Web Links
Unit II
Working with Divs and Layers, Using behaviors - Setting Up Tables, Interactive Forms , Creating lists, Using Frames and Framesets - Working with Timelines.
Unit III
Introduction to Wordpress, Installing – Dashboard and Settings– Working with content– Importing Content.

Unit IV

Creating Themes – Creating Widgets – Creating Plugins– Users and Roles – Performance and Security.

Unit V

Introducing Joomla, Installation and Configuration – Developing Templates – Adding and Modifying Available Extensions – Design Patterns and Joomla.

TEXT BOOKS:
1. Joseph W.Lowery ,"Dreamweaver 8 Bible" Wiley Publishing, Inc.
2. Stephanie Leary "Beginning WordPress 3 " A press.
3. Dan Rahmel "Professional Joomla!", Wiley Publishing, Inc.

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Program : MCA
Course Title : Elective : Software Development Lifecycle Management
Course Code : 20PCA2EC1
Year : I   **Semester** : II
Hours/Week : 4   **Credits** : 4

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COURSE OBJECTIVES

1. Recognize that there are different methodologies that can be used for software development.
2. Appreciate all stages of the software development lifecycle
3. To make aware of the basic concept software project
4. To understand the concept of introduction to strategic assessment
5. Understand the role of configuration management and version control systems and how to apply them. Understanding and complying with business processes.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic idea to create software project	K1
CO2	Understand the concepts of strategic assessment	K2
CO3	Understand the concepts monitoring and control	K3
CO4	Apply the concepts to solve real-time in software project	K3
CO5	Understanding and complying with business processes	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	M	S	S	L	L	M
CO3	S	S	M	S	L	S	L	M	M	L
CO4	S	S	M	S	M	S	S	L	M	L
CO5	S	M	M	M	L	S	M	S	L	M

S - Strong; M – Medium; L - Low

Unit – I

Introduction – What is a Project – Software Project versus Other Types of Project – Activities Conversed by Software Project Management – Some Ways Of Categorizing Software Projects – The Project as a System – What is Management – Problem with Software Projects – Management Control – Stakeholders – Requirement Specification – Information Specification – Information and Control in Organizations. Identify Project Scope and Objectives Identify Project Scope and Objectives Identify Project Infrastructure - Analyze Project Characteristics - Identify Project Products and Activities

Unit –II

Introduction – Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost-benefit Evaluation Techniques – Risk Evaluation.
Selection of Appropriate Project Approach: Introduction – Choosing Technologies - Technical Plan Contents list – Choice of Process Models – Structured Methods – Rapid Application Development – The Waterfall Model – The V Process Model – The Spiral Model – Software Prototyping – Other Ways of categorizing Prototypes – Tools

Unit- III

Risk Management: Introduction – The Nature of risk – Managing Risk – Risk Identification – Risk Analysis – Reducing the risk – Evaluating risks to the Schedule – Calculating the Z Values- Resource Allocation : Introduction – The Nature of Resources – Identifying Resource Requirements – Scheduling Resources – Creating Critical Paths – Counting the Cost – Being Specific – Publishing the Resource Schedule – Cost Schedules – The Scheduling Sequence.

Unit – IV

Monitoring and Control : Introduction – Creating the Framework – Collecting the Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting the Project back to Target – Change Control. - Managing Contracts: Introduction – Types of Contract – Stages in Contract Placement – Typical Terms of a Contract – Contract Management – Acceptance.

Unit – V

Managing People and Organizing Teams : Introduction – Understanding Behaviors – Organizational Behaviors: a background – Selecting the right Person for the job – Instruction in the best methods – Motivation – working in Groups – Becoming in Groups – Becoming a Team – Decision Making – Leadership –Organizational Structures.-Small Project: Introduction – Some Problems with Student Projects – Content of a Project Plan

TEXT BOOK :

1. Bob Hughes and Mike Cotterell "Software Project Management *". 2nd Edition, Tata McGra-Hill Edition 2001.

REFERENCES BOOK :

1. Mickey Gousset, Brian Keller, Ajoy Krishnamoorthy and Martin Woodward "Professional Application Lifecycle Management".

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020

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Program **:** MCA
Course Title **:** Elective Network Programming using Python
Course Code : 20PCA2ED1
Year **:** I   **Semester** **:** II
 Hours/Week : 4   **Credits** **:** 4

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COURSE OBJECTIVES
1. To create programs that accept user input and read and write to external files using python.
2. To Create a Python application that accesses an API based on user input and processes and displays the JSON data that is returned.
3. To understand the concept of Cisco APIC-EM enhances network management and performance software defined networking (SDN) and network programmability.
4. To understand the concept of the cisco APIC approach to SDN
5. To understand the concept of the REST APIs-REST

COURSE OUTCOMES
On the successful completion of the course, students will be able to

CO1	Know the integration of python program in networking	K1
CO2	Understand the functionalities of python based API &working principles of API based on user input and processes and displays the JSON	K2
CO3	Acquire knowledge on Cisco APIC-EM and SDN.	K2 & K3
CO4	Apply Packet Tracer tool to implement advanced Networking Concept.	K3
CO5	Acquire knowledge on APIs-REST	K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	L	M	S	M	S	M	M
CO2	S	M	S	M	M	S	M	S	M	L
CO3	S	S	S	L	M	S	S	M	M	M
CO4	S	M	S	M	M	S	M	S	M	M
CO5	S	S	S	L	M	S	M	S	M	L

S – Strong; M – Medium; L – Low

Unit-I

Python: Introduction -Python Interpreter: Use Interactive Interpreter as a Calculator -Use Interpreter to Print a String -Open IDLE Interactive Interpreter -Write, Save, and Run Program -Data Types, Variables, and Conversions-Basic Data Types -Boolean Operators -Creating and Using a Variable -Concatenate Multiple String Variables -Converting Data Types -Lists-Dictionaries-User Input -The Input Function -If Functions and Loops-If/Else Function -If/Elif/Else Function - for loop -Create a While Loop

Unit-II

File Access -Read an External File -Remove Blank Lines from the Output - Copy File Content Into a List Variable -APIs and Parsing JSON-APIs and RESTful APIs -Application Programming Interface (API) with example-Web Services Interface using HTTP -RESTful API using HTTP -Anatomy of a RESTful Request -API Documentation - JSON and XML -JSON Response Data -XML Response Data -Parsing JSON with Python: Authenticating a RESTful Request -Get Your MapQuest API Key - Importing Modules -Create Variables for API Request -Test the URL Request -Print the URL and Check the Status of the JSON Request -Test Status and URL Print Commands

Unit-III

Add User Input for Address -Test User Input -Add Quit Functionality -Test Quit Functionality - Parse and Display Trip Data -Test the Parsing and Formatting Functionality -Inspect the Maneuvers JSON Data -Add a For Loop to Iterate Through the Maneuvers JSON Data -Test JSON Iteration and Application Functionality -Check for Invalid User Input -Test Full Application Functionality

Unit-IV

Programming the APIC-EM- Introduction -Computer Requirements -Building an Industry Ecosystem with DevNet -Network Programmability Concepts-Control Plane and Data Plane -Traditional and SDN Architectures -The Cisco APIC Approach to SDN -The Cisco SDN Model with APIC-EM

Unit-V

REST APIs-REST API Review -Operation -REST Request Elements -REST Response Elements - Authenticating with the APIC-EM -Getting a Service Ticket with Python-Create a Host Inventory in Python - Create a Device Inventory in Python -Using the APIC-EM Path Trace API - Packet Tracer Programming: Routing protocol- RIP -EIGRP-OSPF- ACL : Standard ACL- Extended ACL- VLAN - Inter-VLAN

TEXT BOOK:
1. Ryan Tischer, Jason Gooley- Programming and Automating Cisco Networks: A guide to network programmability and automation in the data center, campus, and WAN, Cisco Press, 2016
2. Eric Chou- Mastering Python Networking, Packt Publishing Ltd, 2017
3. https://www.netacad.com/group/landing/v2/learn/

REFERENCE BOOK
1. Gowrishankar S, Veena A- Introduction to Python Programming, CRC Press, 2018
2. Steven F. Lott- Python Essentials, Packt Publishing Ltd, 2015
3. https://1040239.netacad.com/courses/795906

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program **:** MCA	
Course Title : Elective: Internet of Things	**Course Code :** 20PCA2EE1
Year : I	**Semester** : II
Hours/Week : 4	**Credits** : 4

COURSE OBJECTIVES
1. To know about the IoT Applications.
2. To develop simple programs to collect sensor data.
3. To analyze the real time sensor data with Arduino code.
4. Analyze various protocols and its usage in communication
5. Create Program to implement IoT applications.

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Recognize and describe the Internet of computer and Internet of Things	K1
CO2	Classify IoT architecture based on their applicability.	K2
CO3	Identify the different protocols used in different layer	K2 & K3
CO4	Implement Python Program in Raspberry PI board using python.	K4
CO5	Express the IoT application in various real time problems	K3 &K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	S	M	L	S	M	S	M	L
CO2	S	M	S	L	L	S	M	M	L	M
CO3	S	S	S	M	M	S	M	M	L	M
CO4	S	M	M	L	L	S	M	S	M	L
CO5	S	S	S	L	M	S	M	M	M	M

S – Strong; M – Medium; L – Low

Unit I

Introduction – Purpose and Features –   Advantages.Arduino: What is Arduino – Board Description – Program Structure – Data Types – Variables and Constants– Operators – Control Statements and Functions – Loops - Strings and String Object –Timing Functions– Arrays.Function Library: I/O Functions – Character Functions – Math Library –Trigonometric Functions.
Unit II

Pulse with Modulation– Random numbers – Interrupts – communication – Inter-integrated Circuit – Serial Peripheral Interface – Keyboard Serial -Blinking LED – Fading LED – Serial and parallel Connections – Connecting Switch and Resistors.

Sensors: Talking with Sensors – IR Sensor – PIR Sensor – Ultrasonic Sensor – humidity and temperature Sensor – Photo resistor – Moisture Sensor – Vibration Sensor – Touch Sensor – Smoke Sensor.

Unit III

Actuation: Servo Motor– Potentiometer – Relay shield. -Communication and Integration: Sending and Receiving Data using Bluetooth Sensor ,-GSM Module – Calls and Message in GSM – Working with Wi-Fi Module (NodeMCU).

Unit IV

Raspberry pi Integrating with Python**:** Introduction – Raspberry Pi I Architecture – Specifications Overview and Models**.**Serial Communication – Blinking LED – Fading LED – Serial and parallel Connections – Connecting Switch and Resistors. **Sensors:** Talking with Sensors – IR Sensor – PIR Sensor – Ultrasonic Sensor – humidity and temperature Sensor – Photo resistor – Moisture Sensor – Vibration Sensor – Touch Sensor – Smoke Sensor. **Actuation:** Servo Motor– Potentiometer – Relay shield.

Unit V

Data –Send–Receive–Storage using Mobile App – Data Transfer to Database –Data Display using Dashboard .

Text Books:

1. J. Biron and J. Follett, "Foundational Elements of an IoT Solution", O'Reilly Media, 1st Edition, 2016.
2. "Funduino Tutorials for Arduino", Funduino Service Team ,Edition 2016
3. Scott Fitzgerald and Michael Shiloh,"The Arduino Projects Book",3rd Edition ,2015

Reference Books:

1. Keysight Technologies, "The Internet of Things: Enabling Technologies and Solutions for Design and Test", Application Note, 2016.
2. Charles Bell, "Beginning Sensor Networks with Arduino and Raspberry Pi", Apress, 2013.
3. D. Evans, "The Internet of Things: How the Next Evolution of the Internet Is Changing Everything", Cisco Internet Business Solutions Group, 2011
4. www.spoken-tutorial.org.

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS), COIMBATORE – 641 020.

For candidates admitted from academic year 2020-2021 onwards under New CBCS.

Program : MCA
Course Title : Elective : Software Building / Release and Testing Management
Course Code : 20PCA3EA2
Year : II   **Semester** : III
Hours/Week : 4   **Credits** : 4

COURSE OBJECTIVES
1. To make aware of the basic concept software quality assurance
2. To understand the concept of introduction software testing process
3. To understand the concept of introduction to skill test
4. To understand the concept of software testing tools
5. To understand the various testing model

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic idea to create software quality assurance	K1
CO2	Understand the concepts of testing process	K2
CO3	Understand the concepts monitoring and skill test	K1 &K2
CO4	Apply the concepts to solve real-time in software quality	K3 & K4
CO5	Apply the various testing models	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S	S	M	S	M	M
CO2	M	M	S	S	S	S	M	M	S	S
CO3	S	M	M	S	M	M	L	M	M	S
CO4	S	M	M	M	M	M	M	S	M	S

S – Strong; M – Medium; L – Low

Unit –I

Software quality assurance : Overview – The software Crisis – The birth of software Engineering- The software Chaos – Criteria for the success of a software project – Process oriented software development – Phases in software development life cycle and models – software testing tools- The management process –software quality assurance – quality management system – process change management

Unit –II

Software testing process –Psychology of testing – verification and validation – testing team and development team – cost of quality – characteristics of test engineers-level of testing –testing approaches – types of testing –test plan – criteria for completion of testing – software reliability –manual testing and

its limitation/drawbacks

Unit –III

Software testing tools: Overview –Need for Automated testing tools- Taxonomy of testing tools–Functional/Regression testing tools- Performance testing tools – Testing management tools- Source code testing tool – select a testing tool –Win runner :Overview –Testing application using Win Runner – Test Script Language (TSL) – GUI Map File – Synchronization of test cases – Data-Driven testing – Rapid test script wizard – Mapping custom object to a standard class – checking GUI objects

Unit –IV

Skill Test : Overview –Architecture –Testing an application using skill test- The 4test Scripting language –checkpoint –Data-Driven Test cases –SQA Robot: Overview – Testing an application using SQA Robot –Synchronization of test procedures- Creating Checkpoints- Load Runner : Overview – creating Vuser script using Virtual User Generator – Creating Virtual Users using Load runner Controller

Unit –V

JMeter : Overview- JDBC Test – HTTP test – Test Director :Overview – Testing Management process – Managing the testing process using Test Director

TEXT BOOK :

1.   Dr. K.V.K.K Prasad "Software Testing Tools" 5th Edition, 2004

REFERENCES BOOK :

1.   Srinivasan Desikan ,Gopalaswamy Ramesh **"** Software Testing principles and practices **"** 6th Edition , 2008.
2.   William E.Perry " Effective Methods for Software Testing ", 3rd Edition ,   Willey India Edition .

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS), COIMBATORE – 641 020.

Program **:** MCA
Course Title **:** Elective Practical : Software Building / Release and Testing Management
Course Code : 20PCA3EPA1
Year **:** II   **Semester** **:** III
Hours/Week : 4   **Credits** **:** 3

COURSE OBJECTIVES
1. To make aware of the basic concept software quality assurance
2. To understand the concept of introduction software testing process
3. To understand the concept of introduction to skill test
4. To understand the concept of software testing tools
5. To understand the various testing model

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea to create software quality assurance	K1
CO2	Understand the concepts of testing process	K2
CO3	Understand the concepts monitoring and skill test	K1 &K2
CO4	Apply the concepts to solve real-time in software quality	K3 & K4
CO5	Apply the various testing models	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S	S	M	S	M	M
CO2	M	M	S	S	S	S	M	M	S	S
CO3	S	M	M	S	M	M	L	M	M	S
CO4	S	M	M	M	M	M	M	S	M	S

S – Strong; M – Medium; L – Low

1. Develop requirements specification for a given problem (The requirements specification should include both functional and non-functional requirements. For a set of about 20 sample problems
2. Develop DFD Model (Level 0, Level 1 DFD and data dictionary) of the sample problem (Use of a CASE tool required). (1 class)
3. Develop Structured design for the DFD model developed. (1 class)
4. Develop UML Use case model for a problem (Use of a CASE tool any of Rational rose, Argo UML, or Visual Paradigm etc. is required)
5. Develop Sequence Diagrams
6. Develop Class diagrams.
7. Develop code for the developed class model using Java
8. Use testing tool such as Junit.
9. Use configuration management tool
10. Use any one project management tool such as Microsoft Project or Gantt Project, etc.

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program : MCA
Course Title : Elective: Open Source Application Development with Android and Content Management
Course Code : 20PCA3EB2
Year : II   **Semester** : III
Hours/Week : 4   **Credits** : 4

COURSE OBJECTIVES

1. Know the components and structure of mobile application development frameworks for android
2. Learn the basic and important design concepts and issues of development of mobile applications
3. Combine arrays with adapters in List View, apply and construct for android
4. To understand the concept of introduction to XML and android animation
5. To develop the telephony and notifications and alarms

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Apply foundational mobile application concepts.	K1
CO2	Know the basic idea to create android applications	K1 & K2
CO3	Understand the concepts of XML and intents	K2
CO4	Understand the concepts android animation	K2
CO5	Apply the concepts to solve real-time android applications	K2 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	M	S
CO2	S	S	L	M	M	S	S	M	M	M
CO3	S	S	M	S	M	S	M	S	S	L
CO4	S	S	M	S	M	S	S	M	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L - Low

Unit -I

The History of the Android OS-Configuring Your Android App Development System-Updating Eclipse ADT-Configuring EclipseAndroid SDK Manager Repository-Android Virtual Devices- Creating the AVD- Android Application Development Platform: How the Android Platform is Structured–Android Runtimes-Creating Your First Android Application- Android Resources- Asset Project Folders

Unit –II

Introduction to XML:Defining an Android App, Its Design, and Constants-Android Screen Design: Writing to the Display Using Activity and View- Making Apps Interactive: Intents, Event Handling, and Menus.

Unit- III

Android Animation: Making Your UI Designs Move-Frame Animation Concepts and Techniques-Creating Frame Animation Using XML Markup-Creating Frame Animation in MainActivity-Creating Tween Animation Using XML- MarkupHybrid -Animation Using Frames with Tween-Streaming Video, MediaPlayer, and MediaController classes

Unit –IV

Telephony: Exploring telephony background and terms – accessing telephony information – interacting with the phone – working with the messaging: SMS-**Notifications and alarms:** Introducing Toast – introducing notifications – introducing alarms-**Graphics:** Drawing graphics in android – Creating animations with android's graphics API – introducing OpenGL for embedded system

Unit -V

Location, location, location: Simulating your location within the emulator – Using LocationManager and LocationProvider – Working maps – Converting places and address with Geocoder - **Bluetooth and sensor**s: Capabilities- Sensor Manager

TEXT BOOK :

1. Wallace Jackson, Android Applications for Absolutes Beginners, Publisher Apress, Edition Third ,Year 2014

2. W. Frank Ableson Robi Sen Chris King "Android in Action" .2nd Edition , Manning Publications,2011.

REFERENCES BOOK :

1. Shawn Van Every "Pro Android Media: Developing Graphics, Music, Video, and Rich Media Apps for Smartphones and Tablets ".

2. W. Frank Ableson Robi Sen Chris King "Android in Action" .2nd Edition , Manning Publications,2011.

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Program	**:** MCA
Course Title	**:** Elective Practical :Open Source Application Development with Android and Content Management
Course Code	**:** 20PCA3EPB1

Year	**:** II	**Semester**	**:** III
Hours/Week	**:** 4	**Credits**	**:** 3

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COURSE OBJECTIVES

1. Know the components and structure of mobile application development frameworks for android
2. Learn the basic and important design concepts and issues of development of mobile applications
3. Combine arrays with adapters in List View, apply and construct for android
4. To understand the concept of introduction to XML and android animation
5. To develop the telephony and notifications and alarms

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Apply foundational mobile application concepts.	K1
CO2	Know the basic idea to create android applications	K1 & K2
CO3	Understand the concepts of XML and intents	K2
CO4	Understand the concepts android animation	K2
CO5	Apply the concepts to solve real-time android applications	K2 & K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	M	S
CO2	S	S	L	M	M	S	S	M	M	M
CO3	S	S	M	S	M	S	M	S	S	L
CO4	S	S	M	S	M	S	S	M	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L - Low

1. Write a android program to display the date and time picker
2. Write a program to demonstrate usage of two textbox(EditText), Label(Textview) and Button widgets in android and perform addition of two numbers.
3. Write a android program to display the mobile IMEI Number
4. Write a android program to display the option menu
5. Write a android program to display the List View
6. Write a android program to create user dial call
7. Write a android program to Web view Using Load URl
8. Write a android program to passing values one form to another form
9. Write a android program for include multiple layouts

10. Write a android program display the Custom Font
11. Write a android program display the notification
12. Write a android program display the splash screen
13. Write a android program to create user Send to Sms
14. Write a simple program to demonstrate the contact manager using ContactsContract API (Insert, Delete, Edit, View).
15. Write a simple program to demonstrate working with SQLite Database.

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program   : MCA
Course Title : Elective : AngularJS and DevOps
Course Code : 20PCA3EC2
Year   : II   Semester   : II
Hours/Week : 5   Credits   : 4

COURSE OBJECTIVES
1. To make the students aware of the basic concepts of normal Angular JS and Node.js.
2. To make them understand the concept of Angular 4 CLI and its applications.
3. To develop the web program writing and web oriented logical thinking skills.
4. To develop the advanced component features for web applications
5. To make the performing CRUD operations as in real time angular application.

COURSE OUTCOMES
        After learning the course, the students will able to

CO1	Know the basic idea to create a web page or web sites using Angular JS	K1
CO2	Understand the concepts of developing Node.js based web sites	K2
CO3	Understand the program writing technique using Angular 4 CLI	K2 &K3
CO4	Apply the concepts and develop programs to solve real-time web applications	K3
CO5	Understand the performing CRUD operations as in real time angular application.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L - Low

Unit I
        AngularJS: Introduction – Angular Expressions – Angular Modules – Angular Directives – Angular Model – Angular Data Binding – Angular Controllers – Angular Filters – Angular SQL
Unit II
        Node.js: Introduction – Get Started – Modules – NPM – File System – Events – Node.js with MySql.
Unit III
        Angular 4 CLI: Introduction to Angular – Angular Architecture –Environment Setup – Project Setup – Components – Module – Data and Event Binding
Unit IV

==Styles Binding in Components== – Advanced Component Features – Forms – Template Driven Forms – Reactive Forms – Pipes – Custom Directives – Dependency Injection

Unit V

==Services in Angular – Angular== Routing – Angular Modules – Performing CRUD Operations as in Realtime Angular Application – Case Studies.

TEXT BOOKS:

1. Andrew Grant, "Beginning AngularJS", Pubilshed by Apress.
2. Oswald Campesato, "Angular 4 Pocket Primer", Published by David Pallai, Mercury Learning and Information LLC, 2018

REFERENCES BOOKS:

1. Tutorials Point, "Angular 4", Tutorials Point Book, 2017.
2. http://www.w3schools.com
3. https://www.tutorialspoint.com/angular4/

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

For candidates admitted from academic year 2020-2021 onwards under New CBCS.

Program : MCA
Course Title : Elective Practical: AngularJS and DevOps
Course Code : 20PCA3EPC1
Year : II   **Semester** : III
Hours/Week : 4   **Credits** : 3

COURSE OBJECTIVES
1. To make the students aware of the basic concepts of normal Angular JS and Node.js.
2. To make them understand the concept of Angular 4 CLI and its applications.
3. To develop the web program writing and web oriented logical thinking skills.
4. To develop the advanced component features for web applications
5. To make the performing CRUD operations as in real time angular application.

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea to create a web page or web sites using Angular JS	K1
CO2	Understand the concepts of developing Node.js based web sites	K2
CO3	Understand the program writing technique using Angular 4 CLI	K2 &K3
CO4	Apply the concepts and develop programs to solve real-time web applications	K3
CO5	Understand the performing CRUD operations as in real time angular application.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	M	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L – Low

1. Write AngularJS program and perform AngularJS Directives with valid HTML5 Code.

2. Write AngularJS program and perform AngularJS Expression, using a variable.

3. Write AngularJS program and perform AngularJS Controller.

4. Write AngularJS program to perform ng-app, ng-init and ng-bind options.

5. Write AngularJS program and perform AngularJS module.

6. Write AngularJS program and perform AngularJS Filters by using directive filter orderBy.

7. Write Node.js program and perform event handler operations.

8. Write Node.js program and perform Node.js and MySql.

9. Write the steps to configure Angular 4 CLI with NPM Installation.

10. Write the Angular4 Program and perform the usage of directives.

11. Write the Angular4 Program and display the first contact.

12. Write the Angular4 Program and list of contacts derived from the components.

13. Write the Angular4 Program and route to your first component.

14. Write the Angular4 Program and accessing route parameters.

15. Write the Angular4 Program and fetch data using Http.

16. Write the Angular4 Program and perform two way data binding and sending data.

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program : MCA
Course Title : Elective : **Advanced File System Management and User Administration**
Course Code : 20PCA3EPD1
Year : II   **Semester** : III
Hours/Week : 4   **Credits** : 5

COURSE OBJECTIVES
1. To make aware of the basic concept boot sequence overview
2. To understand the concept of introduction virtual network computing
3. To understand the concept of introduction to anaconda
4. To understand the gateway and configuring routes
5. To understand the concept of server configuration

COURSE OUTCOMES
After learning the course, the students will able to

CO1	Know the basic idea to create boot sequence overview	K1
CO2	Understand the concepts of virtual network computing	K2
CO3	Understand the concepts anaconda	K3
CO4	Apply the concepts to solve real-time in administration	K2 &K3
CO5	Apply the concepts to solve server configuration	K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	L	S	S	L	L	L
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	L	S	S	L	M	L
CO5	S	L	M	M	M	S	M	S	L	L

S - Strong; M – Medium; L - Low

UNIT - I

Boot sequence overview-Boot loader components-GRUB- Kernal Initialization- init initialization - Run levels- Controlling Services - RMP Package Manager- Installing and Removing software-Updating a Kernal RMP- About and using yum- Searching packages and Files-Configuring additional repository-red hat network and server-entitlements- Red hat network client

UNIT – II

SSH: Secure Shell-VNC:Virtual Network Computing – System crontab files Adding a new user account – User private Groups- Modifying and deleting user accounts-Group Administration- password Aging polices-switching accounts- sudo- Default permissions-Access Control Lists- SElinux- SElinux, Continued, Targeted, policy, Management

UNIT – III

Device Recognition- Disk partitioning- managing partitions-Making Filesystems- Mount points- mounting file system with mount-Unmounting file systems- Network interfaces- Driver selection- speed and duplex settings-IPv4 address- Dynamic and static IPv4 configurations-Device Aliases- Routing table-Default gateway-Configuring Routes- Verify IP connectivity- Define the local host name-Local and remote Resolvers – verify DNS Connectivity

UNIT - IV

INSTALLATION: Anaconda, RHEL installer- starting installation – Boot media- accessing the installer – installation method- Network installation server-installation overview-configuring file system-advance partitioning

Troubleshooting : Networking - boot process – file system corruption and recovery- recovery run level

UNIT – V

Server Configuration: FTP Server – DHCP Server – DNS Server –Mail Server – Web Server – Samba Server –Proxy Server (Squid)

TEXTBOOKS:

1. RedHat Enterprise Linux Essentials (RH133)

2. RedHat Enterprise Linux Essentials (RH253)

REFERENCE BOOKS:

1. EVI Nemeth ,"Linux Administration hand " , Pearson Education ,2003.

2. Neil Matthew, "Professional Linux Programming", A Press L.P ,2004.

3. Richard L.Petersen "Linux Complete Reference "5th Edition, TATA McGraw-Hill Edition , 2003

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

For candidates admitted from academic year 2020-2021 onwards under New CBCS.

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Program : MCA
Course Title : Elective Practical: Advanced File System Management and User Administration
Course Code : 20PCA3EPE1

Year **:** II **Semester** **:** III
Hours/Week : 4 **Credits** **:** 3

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COURSE OBJECTIVES

1. To make aware of the basic concept boot sequence overview
2. To understand the concept of introduction virtual network computing
3. To understand the concept of introduction to anaconda
4. To understand the gateway and configuring routes
5. To understand the concept of server configuration

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Know the basic idea to create boot sequence overview	K1
CO2	Understand the concepts of virtual network computing	K2
CO3	Understand the concepts anaconda	K3
CO4	Apply the concepts to solve real-time in administration	K2 &K3
CO5	Apply the concepts to solve server configuration	K3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	L	L	S	M	M	L	S
CO2	S	M	L	M	L	S	S	L	L	L
CO3	S	S	M	S	M	S	L	M	M	L
CO4	S	S	M	S	L	S	S	L	M	L
CO5	S	L	M	M	M	S	M	S	L	L

S - Strong; M – Medium; L – Low

1. Create and Manage Disk partition
2. Manage and Change File System
3. Create and Configure Sub Interface
4. Install and Remove Software
5. Use Kickstart to Automate Installation
6. Group Administration and Modifying/Deleting Accounts
7. Configure NIS Client
8. Configure ACL
9. Configure New Printer
10. Configure RAID

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

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Program **:** MCA
Course Title **:** Elective : Data Warehousing and Mining
Course Code : 20PCA3EE2
Year **:** II **Semester** **:** III
Hours/Week : 4 **Credits** **:** 5

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COURSE OBJECTIVES

1. To expose the students to the concepts of Data warehousing Architecture and Implementation.
2. To learn to use association rule mining for handling large data.
3. To understand the concept of classification for the retrieval purposes.
4. To know the clustering techniques in details for better organization and retrieval of data.
5. Evaluate and critically analyze problems of Information systems.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Preprocess the data for mining applications.	K1 &K3
CO2	Apply the association rules for mining the data.	K2 &K3
CO3	Design and deploy appropriate classification techniques.	K4
CO4	Cluster the high dimensional data for better organization of the data	K3
CO5	Evaluate various mining techniques on complex data objects.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	M	M	S	M	M	L	S
CO2	S	S	M	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	M	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	S	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L - Low

Unit I
  Data warehousing components- Introduction: Overall Architecture - Data warehouse Database - Sourcing, Acquisition, Cleanup and Transformation tools - Meta data Access Tools: Accessing and Visualizing Information - Tool Taxonomy - Query and Reporting Tools - Applications - OLAP tools - Data Mining tools Data Marts - Data Warehouse Administration and Management - Impact of the web - Approaches to Using the web
(PG.NO:55 – 78)

Unit II
  Basic Data mining tasks –Classification-Regression-Time series Analysis-Data mining Issues-Data Mining Metrics- Social Implications of Data Mining-Data mining from a Database Perspective.
(PG.NO:03 – 18)

Data mining Techniques – Statistics- Point Estimation – Bayes theorem – Hypothesis testing – Regression and Correlation – Similarity measures – Decision Trees – Neural networks – Genetic Algorithms.
(PG.NO:42 – 65)

Unit IV

Classification – Bayesian Classification – Distance Based Algorithms – Simple Approach – K Nearest neighbor – Decision Tree based algorithms – CART – Neural network based algorithms – Clustering – Hierarchical Algorithms – Agglomerative Algorithm- Association rules – Apriority algorithm – sampling algorithm – partition algorithm
(PG.NO: 71 – 113,119 – 144,160 – 174)

Unit V

The Business Value – Customer Profitability, Customer Acquisition, Cross Selling, Customer Retention – customer Segmentation.- Case studies.
(PG.NO: 231 – 315)

Text Books

1. Alex Berson, Stephen Smith and Kurt Thearling," Building Data Mining Applications for CRM" Tata McGraw Hill ,2002. (Unit I & V)
2. Margaret H Dunham **"** Data Mining " Pearson Education , 2002 (Unit II,III & IV).

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.

Program : MCA
Course Title : Elective Practical: Data Warehousing and Mining
Course Code : 20PCA3EP5
Year : II   **Semester** : III
Hours/Week : 4   **Credits** : 3

COURSE OBJECTIVES

1. To expose the students to the concepts of Data warehousing Architecture and Implementation.
2. To learn to use association rule mining for handling large data.
3. To understand the concept of classification for the retrieval purposes.
4. To know the clustering techniques in details for better organization and retrieval of data.
5. Evaluate and critically analyze problems of Information systems.

COURSE OUTCOMES

After learning the course, the students will able to

CO1	Preprocess the data for mining applications.	K1 &K3
CO2	Apply the association rules for mining the data.	K2 &K3
CO3	Design and deploy appropriate classification techniques.	K4
CO4	Cluster the high dimensional data for better organization of the data	K3
CO5	Evaluate various mining techniques on complex data objects.	K4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING

C/P	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	S	M	M	M	S	M	M	L	S
CO2	S	S	M	M	M	S	S	M	L	M
CO3	S	S	M	S	M	S	M	M	M	L
CO4	S	S	M	S	M	S	S	L	M	M
CO5	S	S	M	M	M	S	M	S	L	M

S - Strong; M – Medium; L – Low

1. Write a program to perform association task using apriori algorithm

2. Write a program to perform classification using binary logistic regression algorithm

3. Write a program to perform regression using multi variate linear regression algorithm

4. Write a program to perform clustering using k-means algorithm

5. Write a program to perform clustering using C-cluster algorithm

6. Write a program to perform optimization using genetic algorithm

7. Write a program to calculate similarity measures of documents: a) Dice b) Jaccard   c)Cosine d) overlap e) Euclidean   f) Manhattan

8. Write a program to calculate similarity measures of documents: Write a program to find splitivity attribute using ID3 algorithm, CART algorithm, C4.5, SPRINT.

9. Write a program for set of data using NN algorithm

   Write a program divisive clustering algorithm, Hierarchical algorithm, Agglomerative algorithm, squared error clustering algorithm for any set of date