Millia Institute of Technology
Rambagh, Purnea

Affiliated to Purnea University, Purnea

NAAC Accredited & ISO 9001:2015

SYLLABUS

Department of
Master of Computer Applications

2nd SEMESTER

SEMESTER – II										
CC/ CE/ SE/ OE	**Paper Code**	**Paper Title**	**Hours Per Week**			**Credit**	**End-Term Theory Exam Marks**	**Continuous Evaluation Marks**	**End-Term Practical Exam Marks**	**Total Marks**
			L	**T**	**P**					
CC (Core Compulsory)	2MCACCC1	Programming with C++	3	0	2	5	70	30	0	100
	2MCACCC2	Web Technologies	3	0	2	5	70	30	0	100
	2MCACCC3	Data Communication and Computer Networks	4	1	0	5	70	30	0	100
	2MCACCC4	Practical Examination	-	-	-	5	0	0	100	100
CE (Select Any 2)	2MCACCE(A)	Programming in Python	3	0	2	5	70	30	0	100
	2MCACCE(B)	Computer Graphics	4	1	0	5	70	30	0	100
	2MCACCE(C)	Statistical Methods	4	1	0	5	70	30	0	100
SE (Select Any 2)	2MCASEC(A)	Data Mining and Business Intelligence	4	1	0	5	70	30	0	100
	2MCASEC(B)	NOSQL Databases	3	0	2	5	70	30	0	100
	2MCASEC(C)	Angular Java Script	3	0	2	5	70	30	0	100
	2MCASEC(D)	Information Security	4	1	0	5	70	30	0	100
OE	SWAYAM2	- - -	-	-	-	-	-	-	-	-
SEMESTER TOTAL						**40**				**800**

Definition of Credit	12 Hr. Lecture (L) = 1 credit	12 Hr. Practical (P) = 0.5 credit
	12 Hr. Tutorial (T) = 1 credit	12 Hrs. Practical (Lab) = 0.5 credit

SEMESTER – II

2MCACCC1 – PROGRAMMING WITH C++

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CC	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- To Implement Object Oriented Programming.
- To Learn the Syntax and Semantics of the C++ Programming Language.
- To Learn how to Implement Copy Constructors and Class Member Functions.
- To Learn how to Overload Functions and Operators in C++.
- To Learn how Containment and Inheritance Promote Code Reuse in C++.
- To Learn how to Use Exception Handling in C++ Programs.

COURSE OUTCOMES

- Explain Concepts and Advantages of Object-Oriented Programming.
- Apply and implement the concepts of the Object-Oriented paradigms to analyze, design and develop the solutions of real-world problems using the Principles of information Hiding Localization and Modularity.
- Design, Development and maintain the small applications, system utility for societal and academic problems using reusability concepts in team spirit.
- Demonstrate the Advanced Features of C++ Specifically Stream I/O, Templates and Operator Overloading and overriding.

UNIT – WISE SYLLABUS

UNIT-I

Overview of C++: Object Oriented Programming, Concepts, Advantages, Usage, Program Development Environment, C++ Language Standards, Introduction to Various C++ Compilers, C++ Standard Libraries, Main Function in C++, Meaning of Empty Argument List, Function Prototyping, Default Arguments and Argument Matching, User Defined Data Types, Classes & Objects: Structure, Union & Classes, Inline Function, Scope Resolution Operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment, Friend Function, Friend Classes.

UNIT-II

Array, Pointers References & the Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, Call by Reference and Return by Reference Passing References to Objects, Returning Reference, Independent Reference, C++ Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects.

Constructor & Destructor: Introduction, Constructor, Access Specifiers for Constructors, and Instantiation, Parameterized Constructor, Multiple Constructor in a Class, Constructor with Default Argument, Copy Constructor, Destructor.

UNIT-III

Overloading as Polymorphism, Function & Operator Overloading, Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating a Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading the Shorthand Operation (i.e. +=, -= etc.), Operator Overloading Restrictions Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [ ], ( ), -, Comma Operator, Overloading << and >>, Namespaces: Global Namespace and Namespace Standard, Nested Namespaces.

UNIT-IV

Inheritance: Base Class Access Control, Protected Base Class Inheritance, Single, Multiple & Multilevel Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes, Virtual Functions & Polymorphism: Virtual Function, Pure Virtual Functions, Early Vs. Late Binding. Exception Handling: try, throw, catch Sequence, Multiple Catch Blocks, Uncaught Exceptions, Catch-All Exception Handler, Catching Multiple Exceptions, Controlling uncaught Exceptions.

File Handling in C++: C++ I/O System Basics: C++ Streams, the Basic Stream Classes C++ Predefined Streams, File operations in C++, Sequential & Random- Access file operations in C++

UNIT-V

Formatted I/O: Formatting Using the IOS Members, Setting the Formal Flags, Clearing Format Flags, an Overloaded Form of Setf(), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your Own Manipulators.

Class templates: Implementing a Class Template, Implementing Class Template Member functions, Using a Class Template, Function Templates, Implementing Function Templates, Using Template Functions, Template Instantiation, Class Template Specialization, Template Class Partial Specialization, Template Function Specialization, Template Parameters, Static Members and Variables, Templates and Friends, Templates and Multiple-file Projects, Overview of Standard Template Library (STL)

TEXT & REFERENCE BOOKS

- Herbertz Shield, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
- Ashok Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson India, ISBN: 788131791448 / 9788131703830, 8131703835
- R. Subburaj, 'Object Oriented Programming With C++ Vikas Publishing House, New Delhi.ISBN 81-259-1450-1
- E. Balgurusamy, "C++ '' TMH Publication ISBN 0-07-462038-X
- M. Kumar 'Programming In C++'' TMH Publications
- R. Lafore, 'Object Oriented Programming C++"
- Ashok. N. Kamthane, "Object Oriented Programming With ANSI & Turbo C++", Pearson Education Publication, ISBN 8j-7808-772-3

LIST OF PRACTICALS

1. Basic Programming
   - Write a Program That Just Outputs `Hello, World
   - Write a Program to Find Maximum and Minimum of Given 3 Numbers.
   - Write a Program That Output Value as Number and as Character.
   - Implementation of the Function That Calculates the Cross Sum of an Integer. (123 as 1+2+3).
   - Determine Number of Characters in a String.
2. Function and Array
   - Raising a Number N to a Power P is the Same as Multiplying N by Itself P Times. Write a Function Called Power ( ) That Takes a Double Value for N and an INT Value for P, and Returns the Result as Double Value. use a Default Argument of 2 for P, So That If This Argument is Omitted, the Number Will Be Squared. Write a Main ( ) Function That Gets Values from the User to Test This Functions.
   - Write a C++ Program to Sort an Array of Integer in Ascending Order Using a Function Called Exchange( ) Which Accepts Two Integer Arguments by Reference.
3. Write a C++ Program to Implement Function Overloading in Order to Compute.
4. Write a C++ Program to Implement Power (M, N) Where
   a) M is Double and N is Int
   b) M and N are Int.
5. Write a Program That Uses a Structure Called Point to Model a Point. Define Three Points, and Have the User Input Values to Two of Them. Then Set the Third Point Equal to the Sum of the Other Two, and Display the Value of the New Point. Interaction with the Program Might Look Like This:

   Enter Coordinates for P1: 3 4
   Enter Coordinates for P2: 5 7
   Coordinates of P1 + P2 are: 8, 11
6. Create the Equivalent of a Four Function Calculator. Program Should Request the User to Enter a Number, an Operator, and Another Number. It Should Then Carry Out the Specified Arithmetical Operation: Adding, Subtracting, Multiplying, Or Dividing the Two Numbers. (It Should use a Switch Statement to Select the Operation). Finally It Should Display the Result. When It Finishes the Calculation, the Program Should Ask If the User Wants to Do Another Calculation. Response Can Be Y Or N. Some Sample Interaction with the Program Might Look Like This.

   Enter First Number, Operator, Second Number: 10/ 3
   Answer = 3.333333
   Do Another (Y/ N)? Y
   Enter First Number, Operator, Second Number 12 + 100
   Answer = 112
   Do Another (Y/ N) ? N
7. Create a 'Distance' Class with:
   - Feet and Inches as Data Members
   - Member Function to Input Distance
   - Member Function to Output Distance
   - Member Function to Add Two Distance Objects
   - Write a Main Function to Create Objects of Distance Class. Input Two Distances and Output the Sum.
   - 9. Create a Class Called 'Time' That Has
   - Three Integer Data Members for Hours, Minutes and Seconds

- Constructor to Initialize the Object to Zero
- Constructor to Initialize the Object to Some Constant Value
- Member Function to Add Two Time Objects
- Member Function to Display Time in Hh:Mm:Ss Format
- Write a Main Function to Create Two Time Objects, Add Them and Display the Result in Hh:Mm:Ss Format.

8. Create a Class Called 'Employee' That Has
   - Empcode and Empname as Data Members
   - Member Function Getdata( ) to Input Data
   - Member Function Display( ) to Output Data
   - Write a Main Function to Create Emp, an Array of Employee Objects. Accept and
   - Display the Details of At Least 6 Employees.
9. Create a Class Rational Which Represents a Numerical Value by Two Double Values Numerator& Denominator. Include the Following Public Member Functions: Constructor with No Arguments (Default). Constructor with Two Arguments.
   - Void Reduce( ) That Reduces the Rational Number by Eliminating the Highest Common Factor Between the Numerator and Denominator.
   - Overload + Operator to Add Two Rational Number.
   - Overload >> Operator to Enable Input Through Cin.
   - Overload << Operator to Enable Output Through Cout.
   - Write a Main ( ) to Test All the Functions in the Class.
10. Create a Class 'Complex' to Hold a Complex Number. Write a Friend Function To add Two Complex Numbers. Write a Main Function to Add Two Complex Objects.
11. Create a 'Matrix' Class of Size M X N. Overload the '+' Operator to Add Two matrix Objects. Write a Main Function to Implement It.
12. Create a 'String' Class Which Overloads ' = = ' Operator to Compare Two String objects.
13. Create a Base Class Called 'Shape' Having
    - Two Data Members of Type Double.
    - Member Function Get-Data( ) to Initialize Base Class Data Members.
    - Pure Virtual Member Function Display-Area( ) to Compute and Display the Area Of the Geometrical Object.
    - Derive Two Specific Classes 'Triangle' and 'Rectangle' from the Base Class.
    - Using These Three Classes Design a Program That Will Accept Dimension of a Triangle / Rectangle Interactively and Display the Area.
14. Consider the Following Class Definition

    Class Father {
    Protected: Int Age;
    Public:
    Father (Int X) {Age = X;}
    Virtual Void Iam( )
    { Cout<< I Am the Father, My Age is : << Age<< End1:}
    };

    - Derive the Two Classes Son and Daughter from the Above Class and for Each, Define Iam( ) to Write Our Similar But Appropriate Messages. You Should Also Define Suitable Constructors for These Classes.
    - Now, Write a Main ( ) That Creates Objects of the Three Classes and Then Calls Iam ( ) for Them. Declare Pointer to Father. Successively, Assign Addresses of Objects of the Two Derived Classes to This Pointer and in Each Case, Call Iam( ) Through the Pointer to Demonstrate Polymorphism in Action.
15. Write a C++ Program That Displays the Size (in Bytes) of a Given File. The Name of the File is Specified as Command Line Argument.
16. Design Your own Manipulator to Provide the Following Output Specification For printing Money Value:
    - 10 Columns Width
    - The Character '$' At the Beginning
    - Two Digits Precision
    - Filling of Unused Spaces with ' * '
    - Trailing Zeros Shown
17. Write a program in C++ to Create a Function Template
18. Write a program in C++ to Create a Class Template

SEMESTER – II

2MCACCC2 – WEB TECHNOLOGIES

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CC	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- Learn to Design and Develop a Web Page
- Design and Develop a Web Site Using Text, Images, Links, Lists, and Tables for Navigation and Layout.
- Style Your Page Using CSS, Internal Style Sheets, and External Style Sheets.
- Learn to use JavaScript & XML in Web Design.
- Learn How to use Database in Web Design.

COURSE OUTCOMES

- Describe the Concepts of WWW Including Browser and HTTP Protocol.
- List the Various HTML Tags and use them to develop the user-friendly web Pages.
- Define the CSS with its Types and use them to provide the Styles to the web pages at Various Levels.
- Develop the Modern Web Pages Using the HTML and CSS Features with Different Layouts as per Need of Applications.
- Use the JavaScript to Develop the Dynamic Web Pages
- Use Server-Side Scripting with PHP to Generate the Web Pages Dynamically Using the Database Connectivity.
- Develop the Modern Web Applications Using the Client and Server-Side Technologies and the Web Design Fundamentals.

UNIT – WISE SYLLABUS

UNIT-I

Introduction to Web, Web Designing and Website Planning: Concept of WWW, Internet and WWW. HTTP Protocol: Request and Response, Web Browser and Web Servers, Website Hosting Free vs. Paid, Linux Vs. Windows Hosting. Concepts &use of Database & Mail Servers Associated with Web Sites, Features of Web 2.0 Concepts of Effective Web Design, Web Design Issues Including Browser, Bandwidth and Cache, Display Resolution, Look and Feel of the Website, Page Layout and Linking, User Centric Design, Sitemap, Planning and Publishing Website, Designing Effective Navigation, Website Hosting Issues, FTP.

UNIT-II

Web Development with HTML: Basics of HTML, Formatting and Fonts, Commenting Code, Color, Hyperlink, Lists, Tables, Images, Forms, Meta Tags, Character Entities, Frames and Frame Sets, Browser Architecture and Web Site Structure, use of HTML Code Editor & WYSIWYG Editor.

Cascading Style Sheets (CSS): Style Sheets: Need, Introduction, Basic Syntax and Structure, Using CSS- Background Images, Colors and Properties, Manipulating Texts, Using Fonts, Borders and Boxes, Margins, Padding Lists, Positioning Using CSS, CSS2, Overview and Features of CSS3

UNIT-III

Technologies for Web Applications JavaScript & XML JavaScript: Client-Side Scripting with JavaScript, Variables, Functions, Conditions, Loops and Repetition, Pop Up Boxes, JavaScript Objects, the Dom and Web Browser Environments, Manipulation Using Dom, Forms and Validations, DHTML: Combining HTML, CSS and JavaScript, Events and Buttons.

XML: Introduction of XMI, Validation of XML Documents, Ways to use XML, XML for Data Files, HTML vs. XML, Embedding XML into HTML Documents, Converting XML. to HTML. for Display, Displaying XML Using CSS and XSL, Rewriting HTML as XML, Relationship Between HTML, SGML and XML, Web Personalization, Semantic Web, Semantic Web Services. Transforming XML Using XSL and XSLT

UNIT-IV

Web Design with PHP Introduction and Basic Syntax of PHP, Decision and Looping with Examples, PHP and HTML, Arrays, Punctions, Browser Control and Detection, String. Form Processing Files, Cookies and Sessions, Object Oriented Programming with PHP, Introduction to PHP CMS and Framework.

UNIT-V

Introduction to Database Driven Websites with PHP, PHP and MYSQL, Commands with PHP Examples, Connection to Server, Creating Database. Selecting a Database, Listing Database, Listing Table Names, Creating a Table, Inserting Data, Altering Tables, Queries, Deleting Database, Deleting Data and Tables

TEXT & REFERENCE BOOKS

- Roger S. Pressman, David Lowe, "Web Engineering", Tata McGraw Hill Publication, 2007
- Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
- Gopalan N P, Akilandeswari "Web Technology: a Developer S Perspective", PHI
- Chris Bates Web Programming: Building Internet Applications Wiley
- Refter, Fawset- Beginning XML, Wiley India
- H.M. Deitel, P.J. Deitel, A.B. Goldberg - Internet & World Wide Web How to Program, Pearson Education, 3rd Edition
- C. Xavier, "Web Technology & Design", Tata McGraw Hill.
- Ivan Bay Ross, "HTML, DHTML, JavaScript, Perl CGI", BPB.
- Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
- Web Technologies, Black Book, Dreamtech Press
- HTML 5, Black Book, Dreamtech Press,
- Joel Sklar-Web Design, Cengage Learning
- Harwani-Developing Web Applications in PHP and Ajax, Mcgrawhill

LIST OF OPEN SOURCE SOFTWARE / LEARNING WEBSITE

- Browsers Like IE, Mozilla, Firefox Etc.
- Server Software Xampp / Wamp / Lamp
- www.apachefriends.org
- www.w3.org
- www.w3schools.com
- www.php.net
- www.mysql.com

LIST OF PRACTICAL

1. Write an HTML page with Javascript that takes a number from one text field in the range 0 – 999 and display it in other text field in words. If the number is out of range, it should show "out of range" and if it is not a number it should show "not a number" message in the result box.
2. Develop static pages (using only HTML) of an online Book store.
   The pages should resemble: www.amazon.com. The website should consist the following pages.
   - Home page
   - Registration and user Login
   - User profile page
   - Books catalog
   - Shopping cart
   - Payment by credit card Order
3. Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, lines and words in the text entered using an alert message. Words are separated with white space and lines are separated with new line character.
4. Write an HTML page that contains a selection box with a list of 5 countries. In this page when the user selects a country, its capital should be printed next to the list, and add CSS to customize the properties of the font of the capital.
5. Create an XML document that contains 10 users information. Write a script which takes user id as input and returns the user details by taking the user information from XML document.
6. Implement a user validation web application, where user submits the login name and password to server. These are checked against the data already available in database and if the data matches a successful login page is returned otherwise a failure message is shown to the user.
7. A simple calculator web application that takes 2 numbers and an operator (+, -, *, /, %) from an HTML page and returns the result page with the operation performed on the operands.
8. A web application shows a start time at the right top corner of the page and takes a name as input and provides the logout button at bottom. On clicking logout button it should show a logout page with thank you message with the duration of Usage.
9. A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with "hello, and You are not authorized to visit this site" otherwise it should send "You are welcome to this site" message.
10. Write a web application in which the user is first served a login page which takes users name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions if name and password matches, serves a welcome page with user's full name. If name matches and password doesn't match then serves password mismatch page. If name not found in database, serves a registration page where users full name is asked and on submitting the full name, it stores the login name, password and full name in the database.
11. A web application that lists all cookies stored in the browser on clicking "list cookies" button, add cookies if necessary.

SEMESTER – II

2MCACCC3 – DATA COMMUNICATION AND COMPUTER NETWORKS

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CC	4	1	0	5	70	30	0	100

COURSE OBJECTIVES

- Build an understanding of the Fundamental Concepts of Computer Networking.
- Familiarize with the Taxonomy and Terminology of the Computer Networking Area.
- Introduce about various Networking Devices.
- Introduce about concept of Routing in networking.
- Preparing the Student for Entry Advanced Courses in Computer Networking.

COURSE OUTCOMES

- Demonstrate the Basic Concepts of Networking, Networking Principles, Routing Algorithms, IP Addressing, and Working of Networking Devices.
- Demonstrate the Significance, Purpose, and application of Networking Protocols and Standards.
- Describe, compare, and contrast LAN, WAN, MAN, Intranet, Internet, AM, FM, PM, and Various Switching Techniques.
- Explain the working of Layers and apply the various protocols of the OSI & TCP/IP model.
- Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.
- Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment.
- Install and Configure Networking Devices.

UNIT – WISE SYLLABUS

UNIT-I

Introduction to Computer Networks, Types of Network - LAN, WAN, MAN, Internet, Network Topologies, Transmission Media, Communication Mode: Simplex, Half Duplex, Full Duplex. Analog & Digital Signals, Base Band, Broad Band, Error Detection and Correction, OSI Model: Functions of Each Layer, Services and Protocols, Inter-Networking Devices, Hub, Repeater, Bridge, Switch, Modem, Routers Gateways.

UNIT-II

Multiplexing Multiplexer FDM, TDM Statistical Multiplexing, Modulation AM, FM, PM, Switching Technique, Message Switching, Circuit Switching, Packet Switching, Virtual Circuit, Framing, Error Control, Sliding Window Protocols, DLL Protocol – HDLC, PPP, Medium Access Sub-Layer – Channel Allocation, MAC, ALOHA, CSMA, Collision Free Protocols, IEEE Standards, 802.3, 802.4, 802.5. Fast Ethernet, FDDI Token Ring.

UNIT-III

Routing Algorithm: Shortest Path Routing, Distance Vector Routing, Unicast Routing, Multicast Routing, Link State Routing, Broadcast Routing, Congestion Control, Traffic Shaping. TCP/IP: Introduction, History of TCP/IP, Architecture, Layers of TCP/IP, Comparison Between OSI and TCP/IP Models, Transmission Control Protocol, User Datagram Protocol, Internet Protocol IP Addressing, IP Addressing Classes, Internet Protocols – IP Packet, ARP, RARP, ICMP.

UNIT-IV

Various Protocol, HTTP, Telnet, FTP, SMTP, Mine, UDP, URL (Uniform Resource Locater), ISDN Channel, ISDN Services, Base Band ISDN, Broadband ISDN, Network Security, Network Security Issues, Firewalls – Need and Features of Firewalls, Types of Firewall Technology - Network Level and Application Level, IP Packets Filter Screening Routers, Limitations of Firewalls.

UNIT-V

Introduction to Wireless Network, Fundamentals of Cellular Systems, Mobile, Ad-Hoc and Sensor Networks, Wireless PAN / LAN / MAN, Multi-Path Propagation, Path Loss, Slow Fading, Fast Fading, Frequency Reuse, Cell Splitting, Cell Sectoring.

TEXT & REFERENCE BOOKS

- Andrew S. Tanenbaum -Computer Networks, Pearson Publishers
- Behrouza Forouzan- Data Communications and Networking - Global
- William a Shay - Understanding Data Communications and Networks – Course Technology Inc
- Prakash C. Gupta -Data Communications and Computer Networks, PHI
- William Stallings- Data and Computer Communications, Pearson Education India
- Larry L. Peterson and Bruce S. Davie – Computer Network – A Systems Approach, Morgan Kaufmann Publishers

SEMESTER – II

2MCACCC4 – PRACTICAL EXAMINATION

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CC	-	-	-	5	0	0	100	100

Practical evaluation will be conducted from below listed papers *(whichever is / are opted by candidates)*:

1. Paper 2MCACCC1
2. Paper 2MCACCC2
3. Paper 2MCACCE(A)
4. Paper 2MCASEC(B)
5. Paper 2MCASEC(C)

SEMESTER – II

2MCACCE(A) – PROGRAMMING WITH PYTHON

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CE	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- To Introduce Python Programming Language and its Features and Applications.
- To Learn Installing Python.
- To Practice Basic Language Features of Python.
- To Implement Oops Concepts Using Python.
- To Work with Files in Python

COURSE OUTCOMES

- Install and use Python on Various Platform.
- Understand and Explain the features of Python language
- Build package and modules in Python with object-oriented concept.
- Design and Develop Python applications for data analysis
- Write programs for Reading and Writing files in Python.

UNIT – WISE SYLLABUS

UNIT-I

Environment Setup of Python Application Area, Interactive Mode and Script Mode Data Types, Mutable and Immutable Variables, Expressions and Statements, Variables and Keywords, Operators and Operands, Expressions and Statements, Taking Input and Displaying Output. Functions: Importing Modules, Invoking Built in Functions, Defining Functions, Invoking Functions, Scope, Passing Parameters, Scope of Variables, Returning Values, Recursion, Conditional and Looping Construct

UNIT-II

Strings: String Operators, Comparing Strings Using Relational Operators; String Functions & Methods, Regular Expressions and Pattern Matching Lists: Concept of Mutable Lists, Creating, Initializing and Accessing the Elements, Traversing, Appending, Updating and Deleting Elements, Composition, Lists as Arguments, List Operations, List Functions and Methods, Dictionaries: Concept of Key-Value Pair, Creating, Initializing and Accessing, Traversing, Appending, Updating and Deleting Elements, Dictionary Functions and Methods, Tuples: Immutable Concept, Creating, Initializing and Accessing Elements, Tuple Assignment, Slices, Indexing, Functions.

UNIT-III

Concept of Object-Oriented Programming: Data Hiding, Data Encapsulation, Class and Object, Polymorphism, Inheritance, Advantages of Object-Oriented Programming over earlier Programming Methodologies. Classes: Defining Classes, Creating Instance Objects, Accessing Attributes and Methods, Constructor Methods in a Class, Private Attributes (Limited Support), Importance of "Self" (Acts as a Pointer to Current Calling Object) Operator Overloading with Methods.

UNIT-IV

Inheritance: Concept of Base Class and Derived Class: Single, Multi-level and multiple Inheritance-Overriding Methods, Using Super() in Derived Class to Invoke Init() Or Overridden Methods of Parent Class Data, File: Need for Non-Bold for Data File, Types of Data File-Text and Binary, Opening and Closing Files - Open(), Close(), Access Modes (Output, Input, Default), File Object, Access Modes, Reading and Writing a File - Read(), Readline(), Readlines(), Write(), Writeliness, File Positions (Seek(), Tell()), Renaming and Deleting a File, Flush()

UNIT-V

Implementation of Basic File Operations on Text and Binary File in Python: Creating / Writing Data into File, Reading and Displaying Data from File, Searching for Particular Data from a File, Insertion and Deletion of Data from an Already Existing File, Modification of Data in FileError and Exceptions: Nameerror, Indexerror, Typeerror, I/O Error, Importerror, Valueerror, Eoferror, Generator Function Using Yield

TEXT & REFERENCE BOOKS

- Mark Lutz Learning Python, 5th Edition O'reilly Publication
- Fabrizio Romano Learning Python - Download Link – Https://Www.Packtpub.Com/Packt/Free-Ebook/Learning-Python

- Mark Lutz Learning Python (Fourth Edition) - Download Link - Http://Freebook.Qiniudn.Com/Learning%20python, %204th%20edition.Pdf
- Https://Docs.Python.Org/3/Tutorial/Index.Html

LIST OF PRACTICAL

1. Program to demonstrate basic data type in python
2. A cashier has currency notes of denominations 10, 50, and 100.If the amount to be withdrawn is input through the keyboard using input() function in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer
3. Program to demonstrate list and tuple in python
4. Write a program in Python, A library charges a fine for every book returned late. For first 5 days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message
5. Write a program to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs.12.00 per hour for every hour worked above 40 hours. Assume that employee do not work for fractional part of an hour.
6. Two numbers are entered through the keyboard, write a program to find the value of one number raised to the power of another
7. Write a function that receives marks received by a student in 3 subjects and returns the Average and percentage of these marks. Call this function from main() and print the result in main
8. Write a program to read a file and display its contents
9. Write a program to demonstrate database connectivity in python

SEMESTER – II

2MCACCE(B) – COMPUTER GRAPHICS

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CE	4	1	0	5	70	30	0	100

COURSE OBJECTIVES

- Introduce Computer Graphics - Software, Hardware, Applications
- Understand the various object Drawing Algorithms
- Learn the Basic Principles of 2 Dimensional, 3-Dimensional Transformations
- Understand the Concepts of Curves and Surfaces
- Understand the Concepts of Viewing and Projection
- Learn and Understand the basic tools used in creation in Multimedia.

COURSE OUTCOMES

- Able to describe the Basic Concepts and terminologies used in Computer Graphics
- Apply and Analyze different Approaches/ Algorithms for Drawing various graphics objects
- Identify and Apply Various Geometrical Transformations Approaches
- Implement Various Algorithms to Polygon Fill.
- Describe the Importance of Viewing and Projections.
- Identify Various Software Systems Used in design, the Creation and Implementation of Multi-Media.

UNIT – WISE SYLLABUS

UNIT-I

Graphics Introduction, Application of Graphics, Elements of Graphics Workstation, Pixel, Frame, Buffer, Resolution, Graphics Display Devices - Raster Scan System, Random Scan System, Refresh CRT, Color CRT, LCD Led Monitor and Plasma Panel, Hard Copy Devices: Printers & Plotters, Input Devices: Mouse, Trackball, Light Pen, Scanner, Digital Camera

UNIT-II

Drawing Geometry: Point–Plotting, Coordinate System, Point Plotting, Line Drawing – Line Segments, Line Drawing Algorithm: DDA Algorithm, Bresenham's Line Algorithm, Circle Drawing, Ellipse Drawing, Polygon Representation Rectangle, Filling– Filled Area Primitives, Scan Line Polygon Fill Algorithm, Flood Fill Algorithm, Boundary Fill Algorithm.

UNIT-III

2D Geometric Transformation: Translation, Rotation, Scaling, Geometric Transformation, Coordinate Transform and Composite Transformation, 2D Viewing Transformation & Clipping: World Coordinate System (WCS), Normalized Device Coordinate System, Point Clipping, Line Segment Clipping, Cohen–Sutherl and Line Clipping.

UNIT-IV

3D Geometric Transformation 3D Geometric Transformation: Translation, Rotation, Scaling, Composite Transformation, 3D Display Methods - Parallel Projection, Perspective Projection, Curve Representation, Bezier and B- Spline Methods.

UNIT-V

Multimedia Basics, Multimedia Applications, Multimedia: Text – Font, Faces, Animating Text, Hyper Text. Sound: Midi, Digital Audio Basics, File Formats Image – Bitmap, Vector Drawing, Color Palate, Image File Formats (BMP, JPG), Video – Broadcast Video Standards (NTSC, PAL), Integrating Computer and Television, Compression and Decompression (JPEG, MPEG). Animation: Principle of Animation, Cell Animation, Kinematics, Morphing

TEXT & REFERENCE BOOKS

- D. Hearn & M. Baker, "Computer Graphics", Prentice Hall
- D. F. Rogers, J. A. Adams, "Mathematical Elements for Computer Graphics", TMH
- Multimedia Systems, J.F.K, Buford, ACM Press, (ISBN 0-201-53258-1).
- Tay Vaughan, Multimedia: Making It Work, McGraw Hill Education
- Ranjan Parekh, Principles of Multimedia, McGraw Hill Education

SEMESTER – II

2MCACCE(C) – STATISTICAL METHODS

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
CE	4	1	0	5	70	30	0	100

COURSE OBJECTIVES

- To develop the student's ability to deal with quantitative & statical data
- To enable the use of statistical methods & techniques wherever relevant.
- To have a proper understanding of various Statistical techniques for solving problems

COURSE OUTCOMES

- Describe and discuss the key terminology, concepts tools and techniques used in Statistical analysis
- Critically evaluate the underlying assumptions of analysis tools
- Understand and critically discuss the issues surrounding sampling, estimation and regression
- Discuss critically the uses and limitations of statistical methods
- Solve a range of problems using the techniques covered

UNIT – WISE SYLLABUS

UNIT-I

Statistics and Data Analysis: Statistical Inference, Samples, Populations, and the Role of Probability, Sampling Procedures; Collection of Data, Measures of Location: The Sample Mean and Median, Measures of Variability, Discrete and Continuous Data, Statistical Modeling.

Probability: Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Bayes" Rule.

UNIT-II

Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions, Joint Probability Distributions.

Mathematical Expectation: Mean of a Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear Combinations of Random Variables, Chebyshev's Theorem.

UNIT-III

Some Continuous Probability Distributions: Continuous Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial, Gamma and Exponential Distributions, Chi-Squared Distribution, Beta Distribution, Lognormal Distribution.

UNIT-IV

Fundamental Sampling Distributions and Data Descriptions: Random Sampling, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, Distribution of S^2, t –Distribution, F-Distribution.

One and Two-Sample Estimation Problems: Introduction, Statistical Inference, Classical Methods of Estimation, Single Sample: Estimating the Mean, Standard Error of a Point Estimate, Prediction Intervals, Tolerance Limits, Two Samples: Estimating the Difference between Two Means, Paired Observations, Single Sample: Estimating a Proportion, Two Samples: Estimating the Difference between Two Proportions, Single Sample: Estimating the Variance, Two Samples: Estimating the Ratio of Two Variance.

UNIT-V

Multiple Linear Regression and Certain Nonlinear Regression Models: Introduction, Estimating the Coefficients, Linear Regression Model Using Matrices, Properties of the Least Squares Estimators, Inferences in Multiple Linear Regression, Choice of a Fitted Model through Hypothesis Testing, Categorical or Indicator Variables, Sequential Methods for Model Selection, Cross Validation, Other Criteria for Model Selection, Special Nonlinear Models for Non ideal Conditions.

TEXT & REFERENCE BOOKS

- Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, Pearson Publisher's.
- S C Gupta and V K Kapoor, Fundamentals of Mathematical Statistics, Khanna Publications.
- T.T. Soong, Fundamentals of Probability and Statistics For Engineers, John Wiley & Sons Ltd.
- Sheldon M Ross, Probability and Statistics for Engineers and Scientists, Academic Press.
- S. D. Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi.

SEMESTER – II

2MCASEC(A) – DATA MINING AND BUSINESS INTELLIGENCE

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
SE	4	1	0	5	70	30	0	100

COURSE OBJECTIVES

- Introduce the Basic Concepts of Data Base, Data Warehouse and Data Mining
- Understand the Concept of Knowledge Discovery
- Understand the process of deriving Information from data with Different Perspectives
- Understand and apply Pre-processing Methods on Raw Data
- Discover Interesting and Useful Patterns and associations, Analyze Supervised and Unsupervised Models
- Understand Business Intelligence Life Cycle and Techniques Used in It

COURSE OUTCOMES

- Demonstrate an Understanding and knowledge of the Data Warehousing, Data Mining and Business Intelligence
- Explain the Data Analysis and Knowledge Delivery Stages.
- Organize and Prepare the Data Needed for Data Mining Using Pre Pre-processing Techniques
- Implement the Appropriate Data Mining Methods Like Association, Classification, Clustering
- Apply Data Mining Methods to Solve Practical Problems. (Analyze the Problem Domain, Data Collection, Pre-processing, Apply Suitable Data Mining Method, Interpret and Visualize the Results and Provide Decision Support.)

UNIT – WISE SYLLABUS

UNIT-I

Data Ware Housing Definition, Usage and Trends, DBMS Vs. Data Warehouse, Data Marts, Metadata, Data Mining Definition & Application, DBMS Vs. Data Mining, KDD Versus Data Mining, Data Mining Techniques, Business Intelligence Introduction, Cycle of a Business Intelligence Analysis Data Pre-processing: Need, Data Cleaning, Integration & Transformation

UNIT-II

Data Warehouse Process & Architecture, OLAP and OLTP Definitions, Difference Between OLAP and OLTP, Dimensional Analysis, Multidimensional Data Mode, Data Cubes, Drill-Down and Roll-Up – Slice and Dice or Rotation, Operations, Types of OLAP, ROLAP Vs. MOLAP, Schemas for Multidimensional Database: Stars, Snowflakes and Fact Constellations
Relation between BI and DW, the Business Intelligence User Types, Standard Reports, Interactive Analysis and Ad Hoc Querying, Parameterized Reports and Self-Service Reporting, Dimensional Analysis, Alerts/Notifications, Visualization: Charts, Graphs, Widgets, Scorecards and Dashboards

UNIT-III

Association Rule Mining, Single - Dimensional Boolean Association Rules Apoiri Algorithm, FT Growth, Multi-Level Association Rules from Transaction Databases

UNIT-IV

Classification and Prediction, Concepts of Decision Tree Induction and Bayesian Classification, Cluster Analysis, Categorization of Methods, Partitioning Methods, K-Means Algorithm, Outlier Analysis, Hierarchical Methods

UNIT-V

Emerging Technologies - Machine Learning, Big Data: Introduction, Importance, Four Vs Data Mining for Business Applications Like Fraud Detection, Market Segmentation, Retail Industry, Telecommunications Industry Banking & Finance and CRM etc., Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, Web Mining Concepts.

TEXT & REFERENCE BOOKS

- Jiawei Han, Michelinekamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers
- Arun K Pujari, “Data Mining Concepts and Techniques”, University Press
- G.K.Gupta, “Data Mining with Case Studies”, PHI Ltd

SEMESTER – II

2MCASEC(B) – NOSQL DATABASES

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
SE	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- To give knowledge about the four types of NoSQL Databases - Document-oriented, Key-Value Pairs, Column-oriented and Graph.
- To understand the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
- To describe architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.
- To acquire skills to define objects, load data, query data and performance tune Key-Value Pair NoSQL databases.
- To acquire skill to use MongoDB.

COURSE OUTCOMES

- Define, compare and use the four types of NoSQL Databases - Document-oriented, KeyValue Pairs, Column-oriented and Graph.
- Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
- Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.
- Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Key-Value Pair NoSQL databases.
- Explain the detailed architecture, define objects, load data, query data and performance tune Graph NoSQL databases.
- Perform hands-on NoSql database lab assignments with MongoDB.

UNIT – WISE SYLLABUS

UNIT-I

Review of the Relational Model, ACID Properties, Distributed Databases: Sharding and Replication, Consistency, The CAP Theorem, NoSQL Data Models. Introduction to NoSQL Database, Architecture, Characteristics and Significance, NoSQL database classification – Key value Stores, Column family Stores, Document store, XML Database, Graph Database, Introduction to MongoDB, Installation, Mongo DB Shell.

UNIT-II

Data Types, Data Modeling: Designing the Database, Drilling Down on Collections, Using Documents, Creating the _id Field, Building Indexes, Impacting Performance with Indexes, Working with data: Navigating Your Databases, Inserting Data into Collections, Querying for Data, Using the Dot Notation.

UNIT-III

Using Sort, Limit, and Skip Functions Working with Capped Collections, Retrieving a Single Document, Using the Aggregation Commands, Working with Conditional Operators, Leveraging Regular Expressions, Updating Data, Updating with update(), Updating Information Automatically, Specifying the Position of a Matched Array.

UNIT-IV

Atomic Operations, Modifying and Returning a Document Atomically, Renaming a Collection, Removing Data, Referencing Data, Implementing Index-Related Functions, Surveying Index - Related Commands, Forcing a Specified Index to Query Data, Constraining Query Matches.

UNIT-V

Working with GridFS, Getting Started with the Command-Line Tools, Using the _id Key, Working with Filenames, Determining a File's Length, Working with Chunk Sizes, Tracking the Upload Date, Hashing Your Files, Using the search Command, Deleting, Retrieving Files from MongoDB.

TEXT & REFERENCE BOOKS

- NoSQL For Dummiesby Adam Fowler A Wiely brand

- MongoDB Documentation online available at https://docs.mongodb.com/
- Mongo DB Basics by David Hows, Peter Membrey, Eelco Plugge.: Apress.
- https://www.amazon.com/NoSQL-Distilled-Emerging-Polyglot-Persistence/dp/0321826620 (Kindle edition)
- https://www.tutorialspoint.com/mongodb/mongodb_tutorial.pdf
- http://www.ccs.neu.edu/home/kathleen/classes/cs3200/20-NoSQLMongoDB.pdf
- MongoDB Quick start Guides by Doug Bierer, Packet Publisher, ISBN ISBN 978-1-78934-353-3

LIST OF PRACTICAL

1. Download and install MongoDB
2. Create a MongoDB database to store a collection of documents
3. Load a large amount of document-based data into the collection
4. Query the document collection to research a topic and answer questions

For Lab Assignment 3 and 4
Structure of 'restaurants' collection:

```
{
        "address": {
        "building": "1007",
        "coord": [ -73.856077, 40.848447 ],
        "street": "Morris Park Ave",
        "zipcode": "10462"
        },
        "borough": "Bronx",
        "cuisine": "Bakery",
        "grades": [
                { "date": { "$date": 1393804800000 }, "grade": "A", "score": 2 },
                { "date": { "$date": 1378857600000 }, "grade": "A", "score": 6 },
                { "date": { "$date": 1358985600000 }, "grade": "A", "score": 10 },
                { "date": { "$date": 1322006400000 }, "grade": "A", "score": 9 },
                { "date": { "$date": 1299715200000 }, "grade": "B", "score": 14 }
                ],
        "name": "Morris Park Bake Shop",
        "restaurant_id": "30075445"
}
```

You may download the compressed file (https://www.w3resource.com/mongodb-exercises/restaurants.zip) and uncompress it to find the collection used in our exercises. The collection comprises of 3772 documents.

1. Write a MongoDB query to display all the documents in the collection restaurants.
2. Write a MongoDB query to display the fields restaurant_id, name, borough and cuisine for all the documents in the collection restaurant.
3. Write a MongoDB query to display the fields restaurant_id, name, borough and cuisine, but exclude the field _id for all the documents in the collection restaurant.
4. Write a MongoDB query to display the fields restaurant_id, name, borough and zip code, but exclude the field _id for all the documents in the collection restaurant.
5. Write a MongoDB query to display all the restaurant which is in the borough Bronx.
6. Write a MongoDB query to display the first 5 restaurant which is in the borough Bronx.
7. Write a MongoDB query to display the next 5 restaurants after skipping first 5 which are in the borough Bronx.
8. Write a MongoDB query to find the restaurants who achieved a score more than 90.
9. Write a MongoDB query to find the restaurants that achieved a score, more than 80 but less than 100.
10. Write a MongoDB query to find the restaurants which locate in latitude value less than -95.754168.
11. Write a MongoDB query to find the restaurants that do not prepare any cuisine of 'American' and their grade score more than 70 and latitude less than -65.754168.
12. Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'American' and achieved a score more than 70 and located in the longitude less than 65.754168. (Note : Do this query without using $and operator.)
13. Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'American ' and achieved a grade point 'A' not belongs to the borough Brooklyn. The document must be displayed according to the cuisine in descending order.

14. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Wil' as first three letters for its name.
15. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'ces' as last three letters for its name.
16. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Reg' as three letters somewhere in its name.
17. Write a MongoDB query to find the restaurants which belong to the borough Bronx and prepared either American or Chinese dish.
18. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which belong to the borough Staten Island or Queens or Bronxor Brooklyn.
19. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which are not belonging to the borough Staten Island or Queens or Bronxor Brooklyn.
20. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which achieved a score which is not more than 10.
21. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which prepared dish except 'American' and 'Chinees' or restaurant's name begins with letter 'Wil'.
22. Write a MongoDB query to find the restaurant Id, name, and grades for those restaurants which achieved a grade of "A" and scored 11 on an ISODate "2014-08-11T00:00:00Z" among many of survey dates.
23. Write a MongoDB query to find the restaurant Id, name and grades for those restaurants where the 2nd element of grades array contains a grade of "A" and score 9 on an ISODate "2014-08-11T00:00:00Z".
24. Write a MongoDB query to find the restaurant Id, name, address and geographical location for those restaurants where 2nd element of coord array contains a value which is more than 42 and upto 52.
25. Write a MongoDB query to arrange the name of the restaurants in ascending order along with all the columns.
26. Write a MongoDB query to arrange the name of the restaurants in descending along with all the columns.
27. Write a MongoDB query to arranged the name of the cuisine in ascending order and for that same cuisine borough should be in descending order.
28. Write a MongoDB query to know whether all the addresses contains the street or not.
29. Write a MongoDB query which will select all documents in the restaurants collection where the coord field value is Double.
30. Write a MongoDB query which will select the restaurant Id, name and grades for those restaurants which returns 0 as a remainder after dividing the score by 7.
31. Write a MongoDB query to find the restaurant name, borough, longitude and attitude and cuisine for those restaurants which contains 'mon' as three letters somewhere in its name.
32. Write a MongoDB query to find the restaurant name, borough, longitude and latitude and cuisine for those restaurants which contain 'Mad' as first three letters of its name.

SEMESTER – II

2MCASEC(C) – ANGULAR JAVA SCRIPT

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
SE	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- Implement single-page applications, Build Angular Forms
- Understand the use of Modules, Controllers and Directives
- Understand the concept and implementation of Dependency Injection
- Master AngularJS expressions, filters, and scopes

COURSE OUTCOMES

- Build real client apps with Angular on your own
- Troubleshoot common compile-time and run-time errors
- Write clean and maintainable code like a professional
- Apply best practices when building Angular apps

UNIT – WISE SYLLABUS

UNIT-I

JavaScript Introduction, The Basics of AngularJS - Why We Need Frameworks, What Is a Framework?, Downloading and Installing AngularJS, Browser Support, Your First AngularJS Application, Declarative vs. Procedural Programming, Directives and Expressions – What is a Directive?, What Are Expressions?

JavaScript Primer - Including Scripts on a Page, Statements, Functions, Parameters and Return Values, Types and Variables, Primitive Types - Booleans, Strings, Numbers, Undefined and Null, JavaScript Operators, Equality vs. Identity, Pre- vs. Post-Increment, Working with Objects - Creating Objects, Reading and Modifying an Objects Properties, Adding Methods to Objects, Enumerating Properties, Control Flow – Loops, Conditional Statements, Working with Arrays - Array Literals, Enumerating and Modifying Array Values, Callbacks, JSON

UNIT-II

Introduction to MVC - Design Patterns, Model View Controller - Model, View, Controller, A Separation of Concerns, Why MVC Matters, MVC the AngularJS Way, Filters and Modules - Introduction to Filters, Built-in Filters, The Number Filter, The Date Filter, The limit To Filter, AngularJS Modules - What Is a Module?, Bootstrapping AngularJS, Creating a Custom Filter

UNIT-III

Directives - The Basics of Directives, Using Directives, Built-in Directives - ngBind, ngCloak, ngInclude, ngShow and ngHide, ngRepeat, Event-Handling Directives, Using the API Documentation, Creating a Custom Directive-The restrict Option, The template Option, The link Option

Working with Forms - HTML Forms Overview, The form Element, The input Element – button, submit, text, checkbox, password, radio, The textarea Element, The select Element, The label Element, Model Binding, AngularJS Forms, Validating Forms

UNIT-IV

Services and Server Communication-Using Services, The $window Service, The $location Service, The $document Service, Why Use Services?, Creating Services – Promises, Server Communication, Handling Returned Data-Accessing Returned Data, Handling Errors

Organizing Views - Installing the ngRoute Module, Using URL Routes - Defining Routes, Route Parameters, Eager vs. Conservative Routes, Route Configuration Options, HTML5 Mode

UNIT-V

AngularJS Animation - Installing the ngAnimate Module, CSS Animation Overview - Transforms, Transitions, Applying Animations, Deployment Considerations - Configuration, Testing, Error Handling, Hide Unprocessed Templates, Minification and Bundling, Managing the Build Process, Deployment

TEXT & REFERENCE BOOKS

- AngularJS Essentials- Rodrigo Branas, Packet Publishing Ltd Open Source
- AngularJS: Novice To Ninja - Sandeep Panda, Site point Pty. Ltd, Download link http://www.longevity.co.uk/media/1008/angularjs-novice-to-ninja.pdf

SEMESTER – II

2MCASEC(D) – INFORMATION SECURITY

CC/CE/ SE/OE	L	T	P	Credit	End-Term Theory Exam Marks	Continuous Evaluation Marks	End-Term Practical Marks	Total Marks
SE	3	0	2	5	70	30	0	100

COURSE OBJECTIVES

- Aware and Understand the Challenges and Scope of Information Security.
- Gain the Knowledge of Basic Security Concepts.
- Learn and Understand the Importance of Cryptographic Algorithms and Their Uses.
- Learn and Understand Access Control Mechanism Used for User Authentication and
- Authorization.
- Understand and Practice the Sockets Layer (SSL).
- Aware and Learn the Usages of Secure Internet Protocol (IP) and HTTPS

COURSE OUTCOMES

- Explain the Principles of Cryptography and Cryptanalysis Including Symmetric and Asymmetric Encryption Hashing and Digital Signatures.
- Explain the Fundamental Notions of Threat Vulnerability Attack and Countermeasure.
- Be Able to Identify the Security Goals of an Information System Point Out Contradictory Goals and Suggest Compromises.
- Identify and Classify Particular Examples of Attacks.
- Implement the Various Security Algorithms.
- Analyze the Root Causes of Attacks & Suggest Appropriate Solution for Different Types of Security Breach Scenario.

UNIT – WISE SYLLABUS

UNIT-I

Introduction: Security Concepts: Confidentiality Integrity and Availability Threats Risks Sources of Threats Attacks Classification Cryptography Confusion Vs. Diffusion Stream Ciphers Vs. Block Ciphers. Classical Cryptography, Objectives of Cryptography. Symmetric Key Cryptography, Asymmetric Key cryptography, Secret-Key and Public-Key Cryptography Cryptanalysis RC5 Blowfish.

UNIT-II

Block Ciphers Block Cipher Principles Feistel Networks S-Boxes and P Boxes Block Cipher Des Elementary Number Theory Prime Numbers Factoring Modular Arithmetic GCD Modular Square Roots.

Key Exchange: Diffie-Hellman Public-Key Encryption: RSA Entity Authentication: Passwords Challenge-Response Algorithms Digital Signature Digital Certificates X509 Certificates SSL HTTPS and IPSEC.

UNIT-III

Introduction to Hash Function: Message Digest: MD5 and SHA-1 Attacks on Hash Functions. MD Family SHA Family Trapdoor Functions Digital Signatures Overview of GPG Seahorse Frontends– Kleopatra Enigmail.

UNIT-IV

Network Issues Public-Key Infrastructure (PKI) Kerberos Encryption Using Non-Cryptographic Tools (VI Zip) Authentication Principles and Methods Passwords Two-Factor Authentication Steganography Penetration Testing and Ethical Hacking.

UNIT-V

Internet Security & Wireless Security: Firewall & IDS Firewall Techniques, Firewall Architecture, Types of IDS, IDS Tools. Email & Transaction Security Mechanisms, Privacy Enhanced Mail (PEM), Client-Server Security on web, Wi-Fi & IEEE 802.1 Security, Bluetooth Security.

TEXT & REFERENCE BOOKS

- William Stallings Cryptography and Network Security PHI.
- Bruce Schneier- the Mathematics of Encryption- American Mathematical Society
- Atulkahate “Cryptography and Network Security” TMH.

- Calabrese Info Security Intelligence-Cryptography Principles Appl- Cengage Learn.
- Krawetz- Intro to Network Security Cengage Learning.
- Bruce Schneier Applied Cryptography John Wiley and Sons Mark Stamp
- Mark Stamp Information Security: Principles and Practice John Wiley and Sons.
- Matt Bishop Computer Security Art and Science Pearson Education
- Merkow & Breithaupt, Information Security: Principles and Practices, PE.