



MANONMANIAM SUNDARANAR UNIVERISTY,  
TIRUNELVELI-12

## SYLLABUS

### UG - COURSES – AFFILIATED COLLEGES

Course Structure for MCA  
(Choice Based Credit System)

(with effect from the academic year 2023-2024 onwards )



Semester-III				
Part	Subject Status	Subject Title	Subject Code	Credit
III	CORE VII	DOT NET TECHNOLOGIES	WCAM31	4
III	CORE VIII	BIG DATA ANALYTICS	WCAM32	4
III	CORE IX	MOBILE COMPUTING	WCAM33	4
III	CORE LAB V	DOT NET TECHNOLOGIES	WCAL31	3
III		MINI PROJECT	WCAP31	6
III	ELECTIVE V	RESEARCH METHODOLOGY	WCAE32	3
III	SEC - III	SOCIAL NETWORKS	WCASE31	2
III		INTERNSHIP/ INDUSTRIAL VISIT/FIELD VISIT / RESEARCH KNOWLEDGE UPDATION ACTIVITY	WCAI31	2



**Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks**

**A. Scheme for internal Assessment:**

Maximum marks for written test: **20 marks**

**3 internal tests**, each of **1 hour** duration shall be conducted every semester.

To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be:

Written test- 20 marks; Assignment -5 marks Total - 25 marks

**B. Scheme of External Examination**

**3 hrs.** examination at the end of the semester

A – Part : 1 mark question two - from each unit

B – Part : 5 marks question one - from each unit

C – Part : 8 marks question one - from each unit

➤ **Conversion of Marks into Grade Points and Letter Grades**

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	O	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	A	8	Very Good
4	60-69	B+	7	Good
5	50-59	B	6	Above Average
6	40-49	C	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

➤ **Cumulative Grade Point Average (CGPA)**

$$CGPA = \frac{\Sigma (GP \times C)}{\Sigma C}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

➤ **Classification**

- First Class with Distinction : CGPA  $\geq$  7.5\*
- First Class : CGPA  $\geq$  6.0
- Second Class : CGPA  $\geq$  5.0 and  $<$  6.0
- Third Class : CGPA  $<$  5.0



# DOT NET TECHNOLOGIES

## Course Objectives:

- To get strong understanding of .NET Framework and C# programming.
- To get advanced programming skills in Visual Studio with C# language.
- To get advanced methods of manipulating data using Microsoft SQL Server.
- To get clear idea of how to develop real-time standalone, web applications using .NET Technologies.
- To get clear understanding and get experience in Microsoft Azure.

## Unit-I

Introducing C#: .NET Framework - C# language - Visual Studio 2017 - Writing a C# Program: Visual Studio 2017 Development Environment - Console Applications - Desktop Applications - Variables and Expressions: Basic C# Syntax - Basic C# Console Application Structure - Variables - Expressions - Flow Control: Boolean Logic – Branching - Looping.

## Unit-II

More About Variables: Type Conversion - Complex Variable Types – String Manipulation – Functions: Defining and Using Functions - Variable Scope - The Main Function - Struct Functions – Overloading Functions - Using Delegates - Debugging and Error Handling: Debugging in Visual Studio - Error Handling - Introduction to Object Oriented Programming: Object-Oriented Programming - OOP Techniques - OOP in Desktop Applications.

## Unit-III

Defining Classes: Class Definitions in C# - System .Object - Constructors and Destructors - OOP Tools in Visual Studio - Class Library Projects - Interfaces Versus Abstract Classes - Struct Types - Shallow Copying Versus Deep Copying - Defining Class Members: Member Definitions - Additional Class Member Topics - Interface Implementation - Partial Class Definitions - Partial Method Definitions - The Call Hierarchy Window - Basic Cloud Programming: Cloud, Cloud Computing, and the Cloud Optimized Stack – Cloud Patterns and Best Practices - Using Microsoft Azure C# Libraries to Create a Storage Container - Creating an ASP.NET 4.7 Web Site That Uses the Storage Container - Advanced Cloud Programming and Deployment: Creating an ASP.NET Web API - Deploying and Consuming an ASP.NET Web API on Microsoft Azure - Scaling an ASP.NET Web API on Microsoft Azure.

## Unit-IV

.NET Standard and .NET Core: Cross-Platform Basics and Must Know Terms – Need of .NET – Referencing and Targeting Frameworks - .NET Core - Building and



Packaging a .NET Standard Library - Building a .NET Core Application with Visual Studio - Porting from .NET Framework to .NET Core - ASP.NET and ASP.NET Core: Overview of Web Applications – Use of ASP.NET - ASP.NET Web Forms – Creating ASP.NET Core Web Applications – Files: File Classes for Input and Output – Streams - Monitoring the File System - XML and JSON: XML Basics - JSON Basics - XML Schemas - XML Document Object Model - Converting XML to JSON - Searching XML with XPath.

### **Unit-V**

LINQ: LINQ to XML - LINQ Providers - LINQ Query Syntax - LINQ Method Syntax - Ordering Query Results - Understanding the order by Clause - Querying a Large Data Set -Using Aggregate Operators – Using the Select Distinct Query - Ordering by Multiple Levels -Using Group Queries - Using Joins – Databases: Using Databases - Installing SQL Server - Express - Entity Framework - Code First Database – Finding the Database - Navigating Database Relationships - Handling Migrations - Creating and Querying XML from an Existing Database - Universal Apps: Windows Universal Apps - App Concepts and Design – App Development - Common Elements of Windows Store Apps - Windows Store.

### **Text book:**

1. Benjamin Perkins, Jacob Vibe Hammer, Jon D. Reid, “Beginning C#7 Programming with Visual Studio 2017”, Wiley Publishing, 2018.Chapters: 1 to 10, 16 to 23, and 25.

### **Reference books:**

1. Nagel, Christian, “Professional C 7 and .NET Core 2.0”, Wrox Publishing, 2018.
2. Mehboob Ahmed Khan, Ovais, “C# 7 and .NET Core 2.0 High Performance”, Packt Publishing, 2018

## **BIG DATA ANALYTICS**

### **Course Objectives**

- To introduce big data tools & Information Standard formats.
- To understand the basic concepts of big data.
- To learn Hadoop, HDFS and Map Reduce concepts.
- To teach the importance of NoSQL.
- To explore the big data tools such as Hive, HBase and Pig.

### **UNIT I**

Big Data and Analytics: Classification of Digital Data: Structured Data- Semi Structured Data and Unstructured Data. Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data – Other Characteristics of Data - Big Data - Traditional Business Intelligence versus Big Data - Data Warehouse and



Hadoop. Environment Big Data Analytics: Classification of Analytics – Challenges - Big Data Analytics important - Data Science - Data Scientist - Terminologies used in Big Data Environments – Basically Available Soft State Eventual Consistency - Top Analytics Tools.

## **UNIT II**

Technology Landscape: NoSQL, Comparison of SQL and NoSQL, Hadoop -RDBMS Versus Hadoop - Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem

## **UNIT III**

MongoDB and Map reduce Programming: MongoDB: Mongo DB - Terms used in RDBMS and MongoDB - Data Types - MongoDB Query Language. MapReduce: Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression

## **UNIT IV**

Hive: Introduction – Architecture - Data Types - File Formats - Hive Query Language Statements – Partitions – Bucketing – Views - Sub- Query – Joins – Aggregations - Group by and Having – RCFile – Implementation - Hive User Defined Function - Serialization and Deserialization.

## **UNIT V**

Pig: Introduction - Anatomy – Features – Philosophy - Use Case for Pig - Pig Latin Overview - Pig Primitive Data Types - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators – Eval Function - Complex Data Types - Piggy Bank - User-Defined Functions - Parameter Substitution – Diagnostic Operator - Word Count Example using Pig - Pig at Yahoo! - Pig Versus Hive

### **Text Book**

1. Seema Acharya, Subhashini Chellappan, “Big Data and Analytics”, Wiley Publications, First Edition,2015

### **Reference Books**

1. Judith Huruwitz, Alan Nugent, Fern Halper, Marcia Kaufman, “Big data for dummies”, John Wiley & Sons, Inc. (2013)
2. Tom White, “Hadoop The Definitive Guide”, O’Reilly Publications, Fourth Edition, 2015
3. Dirk Deroos, Paul C. Zikopoulos, Roman B. Melnky, Bruce Brown, Rafael Coss, “Hadoop For Dummies”, Wiley Publications, 2014
4. Robert D.Schneider, “Hadoop For Dummies”, John Wiley & Sons, Inc. (2012)
5. Paul Zikopoulos, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw Hill, 2012 Chuck Lam, “Hadoop In Action”, Dreamtech Publications, 2010



# MOBILE COMPUTING

## Course Objective:

- To introduce the concepts of wireless devices with signal, Antenna, Radio Frequencies, Signal Propagation.
- To introduce wireless communication and networking principles, that support connectivity to cellular networks, Wireless LAN, GSM, CDMA.
- To introduce the WAP Architecture, MANET and Routing

## Unit-I

Introduction – Applications – History of wireless communication – A Simplified reference model – Wireless transmission – Frequencies for radio transmission – Regulations – Signals –Antennas - Signal propagation: Path loss of radio signals - Additional signal propagation effects - Multi-path propagation – Multiplexing – Modulation Chapters: 1, 2.1 to 2.6

## Unit-II

Spread spectrum – Direct sequence spread spectrum – Frequency hopping spread spectrum – Cellular systems. Medium access control: Hidden and exposed terminals – Near and far terminals – SDMA, FDMA, TDMA, Fixed TDM, Classical Aloha, slotted Aloha, Carrier sense multiple access – Reservation TDMA – Multiple access with collision avoidance – Polling – CDMA – Spread Aloha multiple access. Chapters: 3.1 to 3.3, 3.4.1 to 3.4.4, 3.4.7 to 3.4.9, 3.5.1

## Unit-III

GSM - Mobile services – System architecture – Radio interface – Protocols – Localization and calling – Handover – Security – New Data services. UMTS and IMT-2000 - Satellite Systems: Applications – Basics – Routing – Localization – Handover. Chapters: 3.6, 4.1.1 to 4.1.8, 4.4, 5.2 to 5.6

## Unit-IV

Wireless LAN: Infrared vs. radio transmission – Infrastructure and ad-hoc network – IEEE 802.11 – System architecture – Protocol architecture – Physics layer – Medium access control layer – MAC management – Blue tooth. Mobile network layer: Mobile IP: Goals, assumptions and requirements – entities and terminology – packet delivery – Agent discovery – Registration – Tunneling and encapsulation Recent technologies Chapters: 7.1 to 7.3.5, 7.5, 8.1.1 to 8.1.6

## Unit-V

WAP: Architecture – wireless datagram Protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application



environment, Mobile ad-hoc networks – MANET Characteristics – Classification of MANETs, Routing of MANETs, Proactive Routing Protocol - DSDV, Reactive Routing Protocols – DSR, AODV.Chapter10.3.1 to 10.3.6 (Text Book 2- 6.1, 6.2, 6.4, 6.5, 6.6)

**Text Books:**

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2013.
2. Kum Kum Garg, “Mobile Computing Theory and Practice”, Pearson Education, 2014.

**Reference Books:**

1. Rifaat A. Dayen, “Mobile Data & Wireless LAN Technologies”, Prentice Hall,1997.
2. Steve Mann and Scoot Schibli, “The Wireless Application Protocol”, John Wiley & Inc., 2000.

## **DOT NET TECHNOLOGIES LAB**

**Course Objectives:**

- To get strong understanding of .NET Framework and C# programming.
- To get advanced programming skills in C# .NET OOPs Concepts.
- To get advanced methods of manipulating data using Microsoft SQL Server.
- To get clear idea of how to develop real-time standalone, web applications using ASP .NET.
- To get clear understanding and get experience in Microsoft Azure.

Implement the following problems using C# with Visual Studio 2017

1. Demonstrate method overloading and method overriding
2. Class and Objects
3. Multilevel Inheritance
4. Interfaces
5. Demonstrate multiple type of Exceptions
6. Azure Storage Container Using the Microsoft Azure Storage Client Library
7. Read and Write a Data using Random Access Files
8. Employee management database using LINQ
9. Student management system using ASP.NET
10. Demonstrates simple Universal App.



# **RESEARCH METHODOLOGY**

## **UNIT I**

Introduction - Meaning of Research – Objectives of Research – Types of Research – Motivation of Research – Research approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific method – Research process – Criteria of good Research – Problems encountered by Researchers in India. Defining the Research Problem: What is a Research problem - Selecting the Problem – Technique involved Defining a problem. Research Design: Meaning – Need for Research Design – Features of Good Design – Important concept relating to Research design – Different Research designs – Basic Principles of Experimental Designs

## **UNIT II**

Sampling Design : Census and Sample Survey – Implications of a sample design – Steps in sample design - Criteria of selecting a sampling procedure – Characteristics of a good sample design – Different types of sample design – How to select a random sample – Random sample from an infinite Universe – Complex random sampling designs. Measurements and Scaling techniques : Measurement in Research – Measurement scales – Sources of error in Measurement – Test and sound Measurements – Technique of developing measurement tools – Scaling, Meaning of scaling – Scale classification bases – Important scaling techniques – Scale Construction techniques.

## **UNIT III**

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications. Analysis of Variance (ANOVA): Concept – One way ANOVA – ANOVA in test in Latin Square Design

## **UNIT IV**

Data Collection: Methods of Data Collection – Collection of Primary Data – Observation Method – Interview method – Collection of data through Questionnaires – Collection of data through Schedules – Some other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection. Interpretation and Report Writing: Meaning of interpretation – Why interpretation – Technique of interpretation – Precaution in Interpretation – Significance of Report

## **UNIT – V**

Introduction – Algorithmic Research Problems – Types of Solution Procedure/ Algorithm – Steps of Development of Algorithm – Steps of Algorithmic research – Design of Experiments and Comparison of Algorithms – Meta Heuristics for



Combinational Problems. The Computer – Its role in Research – The Computer and Computer Technology – The Computer System – Important Characteristics – Computer Applications – Computer and Researchers.

### Reference Books

1. C.R.Kothari, “Research Methodology Methods and Techniques”, Second edition, New Age International Publishers, 2020.
2. R.Panneerselvam, “Research Methodology”, PHI, 2009.
3. S.C Gupta and V.K Kapoor, “Fundamentals of Mathematical statistics”, Sulthan Chand & Sons, Delhi, 2020.
4. Deepak Chawla and NeenaSondhi,” Research Methodology: Concepts and Cases”, Vikas Publishing House, 2016.
5. David M.Levine, David F Stephen,e al., “Business Statistics”, Pearson Publisher, 7th edition,2017.
6. Ranjit Kumar “Research Methodology: A Step-by-step Guide for Beginners”, Sage Publications Ltd, 2019.

## SOCIAL NETWORKS

### Course Objectives

- To learn about Social media, Social networking and Webcasts
- To understand and build a Word Press Powered Website
- To analysis the Social Networking & Micro-Blogging.
- To learn and analyze the Widgets & Badges.
- To explore the importance of Website optimization.

### UNIT I:

Introduction: Social Media Strategy-Important First Decisions -Websites, Blogs - RSS Feeds Mapping -Preparation - Multimedia Items Gathering Content for Blog Posts RSS Feeds & Blogs-RSS Feeds-The Feed Reader-The Feed-Options for Creating an RSS Feed-Planning Feed- Blogs-Options for Starting. Blog and RSS Feed-Feed or Blog Content-Search Engine Optimization (SEO)-Feed Burner-RSS Feed and Blog Directories-An Optimization Plan for Blog or RSS Feed

### UNIT II:

Building a Word Press Powered Website: Word Press as A CMS - Diversity of Word Press Sites-The Anatomy of a Word Press Site -a Brief Look at the Word Press Dashboard Planning - Site Themes Plug-ins setting up Sidebars Building Pages- Posting Blog Entries. Podcasting, Vidcasting, & Webcasting- Publishing Options for



Podcast- Creating and Uploading Podcast Episodes-Publishing Podcast Optimizing Podcast- Webcasting

### **UNIT III**

Social Networking & Micro-Blogging: Facebook-The Facebook Profile –Myspace LinkedIn-Twitter-Niche Social Networking Sites-Creating Own Social Network-Promoting Social Networking Presence- Social Bookmarking & Crowd-Sourcing - Social Bookmarking-A Social Bookmarking Strategy- Crowd-Sourced News Sites-Preparation And Tracking Progress Media Communities-Image Sharing Sites-Image Sharing Strategy-Video Sharing Sites-Video Sharing Strategy-Searching And Search Engine Placement-Connecting With Others.

### **UNIT IV:**

Widgets & Badges: Highlighting Social Web Presence-Sharing and Syndicating Content Making Site More Interactive-Promoting Products and Making Money-Using Widgets In Word Press-Widget Communities And Directories- Working Widgets Into Strategy Social Media Newsrooms-Building Social Media Newsroom - Populating The Newsroom-Social Media News Releases-Social Media Newsroom Examples. More Social Tools-Social Calendars-Social Pages Wikis-Social Search Portals-Virtual Worlds.

### **Unit V:**

Website optimization: A Website Optimization Plan-Streamlining Web Presence-An Integration Plan- Looking to the Future-Life streaming: The Future of Blogging-Distributed Social Networking-Social Ranking, Relevancy, and —Defriending-Web 3.0 or The Semantic Web-Mobile Technology- Measuring Your Success-A Qualitative Framework-A Quantitative Framework-Tools to Help You Measure-Come to Your Own Conclusions

### **Text Book**

1. Deltina hay, A Survival Guide To social Media and Web 2.0 Optimizationl, Dalton Publishing, 2009

### **Reference Books**

1. Miriam Salpeter, Social Networking for Career Success, Learning Express, 2011.
2. Miles, Peggy, Internet world guide to webcasting, Wiley, 2008 Professionals”, Wiley Publication,2015.

