

MANONMANIAM SUNDARANAR UNIVERISTY, TIRUNELVELI-12 SYLLABUS PG - COURSES – AFFILIATED COLLEGES



Course Structure for MCA (Choice Based Credit System)

(with effect from the academic year 2024-2025 onwards)

Semester-III						
Part	Subject Status	Subject Title	Subject Code	Credit		
III	CORE VII	DOT NET TECHNOLOGIES		4		
III	CORE VIII	BIG DATA ANALYTICS		4		
III	CORE IX	MOBILE COMPUTING		4		
III	CORE LAB V	DOT NET TECHNOLOGIES		3		
III		MINI PROJECT		6		
III	ELECTIVE V	RESEARCH METHODOLOGY		3		
III	SEC - III	SOCIAL NETWORKS		2		
Ш		INTERNSHIP/ INDUSTRIAL VISIT/FIELD VISIT / RESEARCH KNOWLEDGE UPDATION ACTIVITY		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 I 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	0	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	А	8	Very Good
4	60-69	B+	7	Good
5	50-59	В	6	Above Average
6	40-49	С	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

<u>Cumulative Grade Point Average (CGPA)</u>

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

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

Classification

a)	First Class with Distinction	:	$CGPA \ge 7.5*$
b)	First Class	:	$CGPA \ge 6.0$
c)	Second Class	:	$CGPA \ge 5.0 \text{ and } \le 6.0$

d) 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

Nesamony Memorial Christian College, Marthandam

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 Optimization^{II}, Dalton Publishing, 2009

Reference Books

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

