

**BACHELOR OF COMPUTER APPLICATION MASTER OF COMPUTER APPLICATION
INTEGRATED – SEMESTER NINE**

Ninth Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Advance Database Management System	6	100
2	Computer Based Numerical & Statistical Techniques	6	100
3	.NET with C#	5	100
4	Mobile Technology	5	100
Total		22	

Subject Name: ADVANCE DATABASE MANAGEMENT SYSTEM

Unit I: Introduction

Database management system, Characteristics of the database approach, Actors on the scene, Workers behind the scene, Advantages of Using a DBMS and when not to use a DBMS.

DBMS Architecture: Data Models: Categories of data models, Database state, DBMS Architecture and Data Independence, DBMS architecture, DBMS Languages and Interfaces, Classifications of Database Management Systems.

Unit II: Data Modeling Using E-R Model

Using High Level Conceptual Data Models for Database Design, Example Database applications, Entity Sets and types, Attributes and Keys, Relationship and its types , Constraints, Designing E- R Diagrams, Mapping E-R diagram to relations.

Index Structures for Files: Single Level Ordered Indexes, Primary indexes, Clustering indexes and Secondary indexes. Multi-level indexes, Dynamic Multilevel indexes using B-trees (Introductory concepts), hashing concepts.

Unit III: Relational Data Model

Relation, Integrity constraints, Basic Relational algebra operations, Functional dependencies, Normalization for Relational Databases: Normalization concepts, first, second, third and BoyceCodd normal form.

Unit IV: SQL (DDL/ DML)

Queries, sub queries, updation of a database through views, Update, Delete.

Transaction Processing Concepts and Concurrency Control Techniques: Transaction and System Concepts, Desirable properties of Transactions (ACID), Schedules and Recoverability, Lock-Based Protocols: Locks, Granting of Locks, and Two phase locking protocol and implementation of locking.

References

1. Abraham Silberschatz, Henry Korth, and S. Sudarshan, Database System Concepts, McGraw-Hill, 2010.
2. Raghu Ramakrishnan, Database Management Systems, WCB/McGraw-Hill, 2003,
3. J. D. Ullman, Principles of Database Systems, Galgotia, 1985.
4. R. Elmasri and S. Navathe, Fundamentals of Database Systems, Addison-Wesley, 2008.
5. Bipin Desai, An Introduction to Database Systems, Galgotia, 1990.
6. Serge Abiteboul, Richard Hull and Victor Vianu, Foundations of Databases. AddisonWesley, 1995.

Subject Name: COMPUTER BASED NUMERICAL & STATISTICAL TECHNIQUES

1. Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation, Errors in numerical computation. Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.
2. Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Seidal iterative method, Rate of Convergence. Interpolation and approximation: Finite Differences, Difference tables. Polynomial Interpolation: Newton's forward and backward formula. Central Difference Formulae: Gauss forward and backward formula, Sterling's, Bessel's, Everett's formula. Interpolation with unequal intervals: LaGrange's Interpolation, Newton Divided difference formula, Hermit's Interpolation. Approximation of function by Taylor's series and Chebyshev polynomial.
3. Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule, Weddle's Rule Euler- Maclaurin Formula. Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector method, Automatic error monitoring, stability of solution.
4. Curve fitting, Cubic Spline and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves etc. Frequency Chart: Different frequency chart like Histogram, Frequency curve, Pi-chart. Regression analysis: Linear and Non-linear regression, Multiple regression.
5. Time series and forecasting: Moving averages, smoothening of curves, forecasting models and methods. Statistical Quality Controls methods. Testing of Hypothesis: Test of significance, Chi-square test, t-test, ANOVA, F-Test. Application to medicine, agriculture etc.

Subject Name: .NET WITH C#

1. **Microsoft .NET Technology:** What is .NET?, Microsoft Vision, Problems Before .NET, .NET Technology, .NET Platform, Features of .NET Platform, Other Benefits of Using .NET Architecture, .NET Framework Visual Studio.NET, . NET Languages, Third Party Languages.
2. **.NET Framework:** Common Language Infrastructure, Common Type System (CTS), CLS, MSIL, Architecture of .NET Framework, CLR, User and Program Interfaces, Framework Base Class Library.

3. **C# Basics:** Comparing C# with Java, Features of C#, Identifiers and Variables, C# Keywords, Data Types, Type Conversion.
4. **Programming in C#:** A Simple C# Program, Console Inputs, Multiple “Main ()” Functions, Multi-file Program, Reference Data Type “Object”.
5. **Arrays, Strings and More:** Arrays, Strings, Enumerations, Structures, Methods.
6. **Object Oriented Programming:** Object Oriented Programming, Classes and Objects, Inheritance, Polymorphism, Operator Overloading.
7. **Additional Concepts:** Properties, Indexers, Delegates, Events.
8. **System Namespaces:** System. Console: I/O Operations, System.IO: Input-Output Files, System Threading: Multi-Threading, System.Net & System.Net.Sockets: Networking.
9. **Windows Applications:** Windows Applications Development, Creating Windows Application, Execution of Windows Application, Window Forms.
10. **Common Controls:** Label, Textbox, Button, Combobox, Listbox, Checkbox, Radiobutton, PictureBox, Progressbar, Timer, Tree View, Groupbox & Panel, Menu Controls, MDI Forms.
11. **ASP.NET:** ASP vs. ASP.NET, Features of ASP.NET, ASP.NET Execution Model, ASP.NET Page Life Cycle, Web Site Development, Execution of Website.
12. **Web Form and Controls:** Web Form, Standard Controls.

Subject Name: MOBILE TECHNOLOGY

1. **Introduction to wireless communication:** Need and Application of wireless communication. Wireless Data Technologies Market for mobile.
2. **Wireless transmission:** Frequency for radio transmission signal antennas, signal propagation Multiplexing Modulation, Spread and Cellular systems.
3. **Medium Access Control:** Specialized MAC, SDMA, FDMA, TDMA, and CDMA.
4. **Telecommunication Systems:** GSM, DECT systems –Architecture and protocols, Tetra frame structure, UMTS basic architecture and UTRA modes.
5. **Wireless LAN:** Introduction Infrared v/s Radio transmission Infrastructure and ad-hoc network IEEE, 802.11, HIPERLAN, Blue Tooth.
6. **Wireless ATM:** WATM services, Location Reference model function radio access layer handover Location management, Addressing, Mobile QoS, Access point control protocol.
7. **Mobile Network Layer:** Mobile IP, DHCP.
8. **Mobile Transport Layer:** TCP, Fast and selective retransmission and recovery Transaction oriented TCP.
9. **Support for Mobility:** File systems, World wide web and Wireless Application Protocol with example applications.
10. **Wireless Telephony Applications:** Overview of the WTA Architecture, The WTA client Framework, The WTA Server and security, Design considerations, Application Creation Toolbox.

