Established by Govt. of Arunachal Pradesh vide Act 9 of 2012, the Arunachal University of Studies Act, 2012
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NH-52, District-Namsai, Arunachal Pradesh -792103

MASTER OF COMPUTER APPLICATION – THIRD SEMESTER

Third Semester		
Sr. No.	**Name of Subject**	**Credits**
1	Advance Database Management System	5
2	Computer Based Numerical & Statistical Techniques	5
3	.NET with C#	6
4	Multimedia Technology	6
Total		**22**

Subject Name- ADVANCE DATABASE MANAGEMENT SYSTEM

1. Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.
2. History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.
3. Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.
4. Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.
5. Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.
6. Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless

join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

7. Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for Serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.
8. Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.
9. Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

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 forcasting: 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-MULTIMEDIA TECHNOLOGY

Unit-I

Introduction and Hardware:

Definition of Multimedia, CD-ROMs and Multimedia applications, Multimedia requirements – Hardware, Software, Creativity and Organization, Multimedia skills and training Macintosh Verses PC, the Macintosh platform, PC platform, Connections, Memory and storage devices, input devices, Output hardware, Communication devices.

Unit-II

Multimedia Software:

Basic tools, painting and drawing tools, OCR software, Sound editing programs, Animation devices and digital movies and other accessories, linking multimedia objects, Office suites, word processor, spreadsheets presentation tools, Types of Authoring tools card and page based, icon based and time based authoring tools, Object oriented tools.

Unit-III

Production Building Blocks:

Test-Using test in Multimedia, Computers and Text, Font editing and design tools, Hypertext, Sounds-multimedia system sounds MIDI Verses Digital Audio, Audio file Formats, working with sound in Windows, Notation interchange file format (NIFF), Adding sound.

Unit-IV

Production Tips:

Image-Creation, making still images, images colors, Images, File format, Animation-principles of animations, making workable animations Video, using video, Broadcast Video, Standard, Integrating Computer and TVs, Shooting and editing Video, Using Recording formats, Video tips, Video Compression.

Unit-V

Multimedia Project Development and case Studies:

Project planning, Estimating, RPFs and Bid proposals, Designing, Producing acquiring and using contents, Using Telnet, Testing, Preparing for delivery, CD-ROM Technology and Standards. Designing for the Word Wide, Working on the Web, Text for the Web, Images for the Web, and Animation for the Web.