KOLHAN UNIVERSITY
CHAIBASA

SYLLABUS FOR
B.Sc. Information Technology (Hons)

Under Choice Based Credit System (CBCS)
2017

Semester	Courses	Credit	Examination	Full Marks	Pass Marks	Total
I	BITC1(**Introduction to IT**) BITC2(**Programming in C**) BITC(P)-1 (**Lab on MS-Office & C programming**)	4 4 4	Semester End Semester End Practical	70 70 60	28 28 24	350
	GE-1(**Physics/Chemistry/Maths**) GE(P)-1	4 2	Semester End Practical	70 30	28 12	
	AECC-I(**Eng Communication / MIL Communication**)	2	Semester End	50	20	
II	BITC3(**Digital Electronics**) BITC4(**Data Structure using C++**) BITC(P)-2(**Lab on C++ & Data Structure**)	4 4 4	Semester End Semester End Practical	70 70 60	28 28 24	350
	GE-2(**Physics/Chemistry/Maths**) GE(P)-2	4 2	Semester End Practical	70 30	28 12	
	AECC-II (**Environmental Sc.**)	2	Semester End	50	20	
III	BITC5(**Operating System**) BITC6(**Relational Data Base Management System**) BITC7(**Numerical Techniques**)	4 4 4	Semester End Semester End Semester End	70 70 70	28 28 28	450
	BITC(P)-3 (**Lab on Linux , Oracle & Numerical Techniques**)	6	Practical	90	36	
	GE-3 (**Physics/Chemistry/Maths**) GE(P)-3	4 2	Semester End Practical	70 30	28 12	
	SEC-I(**General Knowledge & Current Affairs**)	2	Semester End	50	20	
IV	BITC8(**Web Technology**) BITC9(**Java Programming**) BITC10(**Software Engineering**)	4 4 4	Semester End Semester End Semester End	70 70 70	28 28 28	450
	BITC(P)-4(**Lab on Internet & Web Technology**)	6	Practical	90	36	
	GE-4 (**Physics/Chemistry/Maths**) GE(P)-4	4 2	Semester End Practical	70 30	28 12	
	SEC-II(**Personality Development**)	2	Semester End	50	20	
V	BITC11(**Windows Programming**) BITC12 (**Data Communication & Computer Networks**) BITC(P)-5(**Lab on Windows Programming & Network**)	4 4 4	Semester End Semester End Practical	70 70 60	28 28 24	400
	DSE-1(**Elective1***) DSE-2(**Elective2****) DSE(P)-1(**Lab on Elective**)	4 4 4	Semester End Semester End Practical	70 70 60	28 28 24	
VI	BITC13(**Computer Graphics & Multimedia**) BITC14(**Advance Web Programming**) BITC(P)-6(**Lab on Computer Graphics & Advanced Web Programming**)	4 4 4	Semester End Semester End Practical	70 70 60	28 28 24	400
	DSE-3(**Elective3*****) DSE(P)-2 (**Lab on Elective**)	4 2	Semester End Practical	70 30	28 12	
	DSE-4 (**Project**)	6	Project	100	40	
TOTAL						2400

Select *only one* paper for each Elective

Elective1*- Decision Support System or Distributed Database .
Elective2-** Data Mining and Warehousing or Cloud Computing.
Elective3*-**Information Security or Electronic Commerce and Application

Practical for 30 Marks:

Sl.No	Evaluation Type	Marks
1	Practical	15
2	Record Book & Attendance	10
3	Viva-Voce	05

Practical for 60 Marks:

Sl.No	Evaluation Type	Marks
1	Practical	40
2	Record Book & Attendance	10
3	Viva-Voce	10

Practical for 90 Marks:

Sl.No	Evaluation Type	Marks
1	Practical	60
2	Record Book & Attendance	15
3	Viva-Voce	15

SEMESTER-I

BITC1	Introduction to IT	70

Module-I: Basic of Computer
Introduction, Characteristics of computers, Generation of Computers, Classification of Computers, The Computer System, Applications of Computers.
Computer Architecture
Introduction, Central Processing Unit (CPU) Memory, Communication between Various Units of a Computer System, Memory- RAM, ROM.

Module-II: Input/ Output Peripherals
Introduction, Keyboard, Pointing Devices, Speech Recognition, Digital Camera, Scanners, Optical Scanners. Introduction, Classification of Output, Hard Copy Output Devices, Printers, Plotters, Computer Output Microfilm (COM), Soft Copy Output Devices, Monitors, Audio Output, Projectors, Terminals.

Module-III: Computer Software
Introduction, Developing a Program, Algorithm, Flowchart, and Pseudocode (P-Code). Introduction, Classification of Programming Languages, Generations of Programming Languages, Features of a Good Programming Language. Introduction, Software: Definition, Relationship between Software and Hardware, Software Categories, System Software, Application Software.
Open Source Terminologies: Open Source Software, Freeware, Shareware, Proprietary Software.

Module-IV: Advanced Trends in IT
Wireless: 3G, 4G, Wi-Fi, Bluetooth, Social Networking, Cloud Technology.

Books:
1) Introduction to computer Science, ITL Education solution Limited, R&D Wing, PEARSON Education and Edition 2004

Reference Books:
1) Rajaraman V. – Fundamental of Computers, Prentice Hall of India Pvt. Ltd., New Delhi – 2nd edition, 1996.
2) Peter Nortorns, " Introduction to Computer", TMH, 2004

BITC2	**Programming in C**	**70**

Module-I: C language fundamentals:
Introduction to C, Character Set, Keywords, Identifiers, Constants, Variables, Storage class, Data types, Operators & Expressions, Header files, Library files, Preprocessor directives, # include and #define.

Module-II: Control Statements and Decision Making:
The goto statement, The if statement, The if-else statement, Nesting of if statements, The conditional expression, The switch statement, The while loop, The do…while loop, The for loop, The nesting of for loops, The break statement and continue statement.

Module-III: Arrays and Functions:
Types of arrays, String functions in C, Structures and Unions, Functions in C, pointers.

Module-IV: File Management:
Defining and Opening a file, Closing Files, Input/output Operations on Files, Predefined Streams.

Books:
1) Y. Kanetkar, "Let Us C", BPB Publication, 13th Edition.
2) E.Balagurusamy," Programming in ANSI C", TMH, Sixth Edition.

BITC(P)-1	**Lab on MS-Office & C programming**	**60**

MS-Office
Topics to be covered: Introduction to Windows OS and MS-Office.

C programming

Topics to be covered: Simple Programs, Control Statements and Decision Making, Array and Functions,Pointers, File I/O.

SEMESTER-II

BITC3	Digital Electronics	70

Module-I: Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

Module-II: Boolean Algebra and Logic Gates: Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operating, Digital Logic Operations, Digital Logic Gates, Integrated Circuits.

Module-III: Gate - Level Minimization: K Map Method, Four - Variable Map, Product of Sums Simplification, Don't - Care Conditions, NAND and NOR Implementations, Exclusive - OR Function.

Module-IV: Combinational Logic: Combinational Logic Circuits & Realisation with Logic Gates – Half & Full Adders and codes, Multiplexers, De-multiplexes, Encoders, Decoders, Codes Converters, Sequential Circuits, JK, RS, T, D, Master – Slaves Flip – Flop, Shift register, Synchronous, and Asynchronous Counters.

Module-V: Memory and Programmable Logic: Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Logic Array, Sequential Programmable Devices.

Books:

1) M.Morris Mano- Digital Design, 3rd Edn, Pearson Education, New Delhi - 2005.
2) B.Ram –Fundamental of Microprocessors And Microcontrollers –Dhanpat Rai Publications, Eighth Edition.

Reference Books:

1) A.B.Marcovitz- Introduction to Logic Design, TMH, New Delhi - 2002.

BITC4	Data Structure using C++	70

Module-I:A First look at a C++ Program, Variables and Constants, Arithmetic Expressions, Logical Expressions and if-else Statements, Iterative Statements, The switch Statement, Arrays, Strings, Structures Pointers, References, Dynamic Memory Allocation.

CLASSES:

Introduction, Public and Private Members, Encapsulation, Implementation of a Class, Syntax for Accessing Class Members, Constructors and Destructors, Arrays of Class Objects, Operator Overloading for Classes, Classes and Efficiency.

Module-II: LINKED LIST:
Data Structures and Abstract Data Types, Linked List Data structure, Linked List- Single Linked Lists, Circular Linked List, Doubly Linked Lists ,Traversal, The Insert Function, Remove Function, Linked Lists vs. Arrays.

Module-III: STACKS:
Introduction, Array Implementation and linked implementation of Stack.

Module-IV: QUEUES:
Introduction, Array Implementation and linked implementation of Queue.

Module-V: TREES AND GRAPH:
Introduction, Binary Search Trees, Tree Traversals, Graph- adjacency lists & adjacency matrix.

Module-VI: SEARCHING AND SORTING:
Introduction, Sequential and Binary Search, Selection Sort, Insertion Sort, Bubble Sort, Quick sort.

Books:
1. M.Litvin&G.Litvin- Programs with C++ and Data structures-Vikas Publishing Home, New Delhi, 2005.
Reference Books:
1. S.Sahni- Data Structures, Algorithms and Applications in C++, 2nd Edn. Universities Press, India, 2005.

BITC(P)-2	**Lab on C++ & Data Structure**	**60**

C++
Topics to be covered: Simple Programs, Conditional, Iteration, Class and Object, Inheritance, Overloading.
Data Structure
Topics to be covered: Linked List, Stack, and Queue.

SEMESTER-III

BITC5	**Operating System**	**70**

Module-I
Operating System Introduction- what is an operating system, History of OS, OS concepts,
Types of OS, OS Structure, System calls and Types.
Processes- Introduction to process, Inter-process Communication, Process Scheduling, Process Synchronization.

Module-II

Memory Management- Introduction, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management- Demand Paging, Page Replacement.

Module-III
Deadlock- Prevention, Avoidance, Detection, Recovery, Algorithms, Disk Scheduling, File system structure, File allocation and Free space management.

Module-IV
Case Study of UNIX
(a) Unix Operating System Overview- Unix System Architecture, Operating System Services, General Unix Commands like ls, cp, etc, Unix Utilities like grep ,wc Etc.
(b) Fundamentals of UNIX shell programming - functions, variables, special symbols, looping and decision making, Test command, error checking in shell programming
(c) Introduction to "vi editor", Features, Use of various keys, and overall using vi editor for editing text.
(d) Security in UNIX - Password, File Permissions, Directory Permissions.

Books:

1) Rohit Khurana, "Operating System", Vikas Publisher, Second Edition.
2) Arbraham Silberschatz & Peter Baer Galvin, "Operating System Concepts, John Wiley & Sons, Seventh Edition.

BITC6	Relational Data Base Management System	70

Module-I: Introduction to DBMS Purpose, difference with respect to conventional file processing system, data independence, data models (object based, record based, physical data models), database manager, database administrator, overall system structure.

Module-II: Entity- relationship model. Relationship sets, mapping, keys, and entity sets, entity – relationship diagram, specialization generalization, and aggregation, database schema under relational model.

Module-III: Relational algebra – Project, select, Cartesian product, natural join, join, union, intersect, minus, division operations.

Module-IV: Normalization – Functional dependency, 1NF, 2NF, 3NF, BCNF, multivaluted, dependency & 4NF. Lossless joins, dependency preservation, redundancy preservation, redundancy control, and integrity preservation during decomposition.

Module-V: Transaction – concept, transaction state, concurrent executions, serialisability, conflict serialisability. Concurrency control – locks, granting of locks, timestamp based protocol, deadlock prevention, detection & recovery.

Module-VI: Oracle: Oracle functions, SQL, (DDL, DML), simple queries, nested subqueries, self join, equijoin, non-equijoin. PL/SQL programming (Writing small blocks for data manipulation), Update, Insert Triggers. Views and grants under Oracle (DCL).

Books:

1) Silberschatz, Korth. Sudarshan,"Database System Concepts", McGraw-Hill, Seventh Edition
2) Date, Kannan, Swamynathan, "An Introduction to Database System", Pearson, Eighth Edition

BITC7	Numerical Techniques	70

Module-I: Errors in Numerical Calculations: Numbers and their accuracy, Errors and their Computations- Absolute, Relative and Percentage, General Error Formula.

Module-II: Solution of Algebraic and Transcendental Equations: Introduction, Bisection method, Iteration method, Method of False Position, Newton- Raphson method.

Module-III: Interpolation: Introduction, Errors in Polynomial Interpolation, Finite Differences- Forward, Backward Difference tables, Differences of a Polynomial, Newton's formulae for Interpolation, Lagrange's Interpolation Formula, Divided Differences and their properties- Newton's General Interpolation Formula, Inverse Interpolation.

Module-IV: Numerical Differentiation and Integration: Introduction, Numerical Differentiation and Errors, Numerical Integration – Trapezoidal Rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule.

Module-V: Numerical Solution of Linear System of Equations: Direct Methods- Matrix Inversion Method, Gauss-Jordan Method, Gauss Elimination Method.

Module-VI: Numerical Solution of Ordinary Differential Equations: Solution by Taylor's Series, Euler's method, Modified Euler's method, Runge-Kutta method of 2nd order.

Books:
1) S.S.Sastry -Introductory methods of Numerical Analysis, 4thEdition, Prentice Hall of India, New Delhi, 2006
Reference Books:
1) V.N.Vedamurthy et.al.-Numerical Methods, Vikas Publishing House, New Delhi, 2005.
2) B.S.Grewal- Numerical Methods in Engineering & Science, Khanna Publishers, Delhi, 2005.
3) S.C.Gupta and V.K.Kapoor – Elements of Mathematics, Statistics, Sultan Chand and Sons.

BITC(P)-3	Lab on Linux ,Oracle& Numerical techniques	90

Linux
Topics to be covered: Linux Command and Shell Script Programming.
Oracle
Topics to be covered: SQL queries related to SQL commands and PL/SQL.
Numerical techniques
Topics to be covered: Experiments based on the course Object Oriented Systems to be done on C++/JAVA/UML/VISIO etc.

• Implement floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
• Deduce errors involved in polynomial interpolation. Algebraic and Trancedental equations using Bisection, Newton Raphson, Iterative, method of false position, rate of conversions of roots in tabular form for each of these methods.
• Implement numerical integration using Simpson's 1/3 and 3/8 rules, trapezoidal rule

SEMESTER-IV

BITC8	Web Technology	70

Module-I: Dynamic HTML: Introduction to HTML, Overview of DHTML, Features of DHTML, Document Object Model, Events, Inner Text Property, Dynamically changing Text attributes, (Style sheet and its properties, inline, embedded, External & Imported Style sheet). Displaying items in Tree structure.

Module -II: Forms, Frames and Embedding Multimedia
Frames: Introduction to Frame, <frameset> and <frame> Tag with its Attributes, Creating Frames, Linking Frames, <noframes> tag, Complex Framesets, Floating or Inline Frame. **Forms :** <Form> Tag and its Attributes, <Input> Tag and its Attributes, **Form Controls:** TextControls, Password Fields, Radio Buttons, Checkboxes, Reset and Submit Buttons, Form Control-Selection, Option Processing and Text Area, Hidden Fields.

Module-III: Java Script: Overview to JavaScript, Features of JavaScript, Variables, Operators, Java Script Object Hierarchy (Window Objects & Array). Various events, methods and Objects of JavaScript, Decision making and Loop forming statements, Functions. Creation of Document at Runtime.

Module – IV: XML: Introduction to XML, XML DTD and XML Schema.

Module-V: PHP: Introduction to PHP, Operators and Flow Control, Strings and Arrays.

Books:
1) Ivan Bay Ross- Web Enable Commercial Application Using HTML, DHTML, BPB Publication
2) Michel Morrison -HTML and XML for Beginners, PHI, New Delhi- 2001
3) Steven Holzner - PHP: The Complete Reference –TMH-Edition 2008

BITC9	Java Programming	70

Module-I:Introduction to Java: History of Java, features of Java, types of Java Programs.JDK Tools- Java C Compiler, Java Interpreter, AppletViewer, job tools, JavapDisassember, Javahdoc Tool, Javah Tool Java keywords, Data types in Java, Variable naming conventions, Initializing variables, Literals, operators, Type conversion, Decision construct, Looping construct, Arrays.

Module-II:Classes and objects: Declaring classes, Creating objects, Declaring objects, Declaring methods, Passing arguments to methods, Constructors, Access Specifiers, Modifiers, The main() method, Overloading, Overriding, Relationship between classes.

Module-III: Exceptions and Database Connectivity: Exception in JAVA, Data base connectivity using JDBC with MS-Access, Oracle and My-SQL, Threads in JAVA

Module-IV: Collection Framework: Collection overview, Collection hierarchy, the collection interface-list interface, set interface, Collection classes-ArrayList class, linked list class, HashMap Class.

Module-V: Applet and JSP: Introduction to Applet, Life cycle of Applet, Introduction to JSP, advantages of JSP, Introduction to Servlet, JSP syntax and semantics.

Books:
1) Herbert Schildt– Java 2 the Complete Reference- TMH Publications-Fifth Edition.
2) E Balaguruswamy-Programming with JAVA-TMH-Fourth Edition.
3) Phil Hanna -JSP 2.0 the Complete Reference – TMH 2003.

BITC10	**Software Engineering**	**70**

Module-I: Introduction to Software Engineering: Characteristics, Emergence of Software Engineering, Software Metrics & Models, and Process& Product Metrics.
Software Life Cycle Models: Waterfall, Prototype and Spiral Models and their Comparison.
Software Project Management: Size Estimation- LOC and FP Metrics, Cost Estimation-Delphi and Basic COCOMO.
Software Requirements Specification: SRS Documents, their Characteristics and Organization.

Module-II: Software Design: Classification, Software Design Approaches, Structured Analysis-Data flow Diagrams and Structured Design, Introduction to Object Oriented Design.

Module-III: Coding and Testing of Software: Unit Testing, Black Box Testing, White Box Testing, Debugging, Program Analysis Tools, System Testing.

Module-IV: Software Quality Assurance: ISO 9000 and SEI CMM and their Comparison. **Software Maintenance:** Maintenance Process Models and Reverse Engineering, Estimation of Maintenance Costs.

Books:
1) Rajib Mall -Fundamentals of Software Engineering, Prentice Hall of India, New Delhi, 2005
Reference Books:
1) PankajJalote- An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, New Delhi,2005
2) Richard Fairley- Software Engineering Concepts, Tata McGraw Hill, New Delhi, 2006.

BITC(P)-4	**Lab on Internet & Web Technology**	**90**

Internet & Web Technology

1. Creation of HTML pages with frames, links, tables and other tags
2. Usage of internal and external CSS along with HTML pages

3. Creation of XML document for a specific domain
4. Writing DTD or XML schema for the domain specific XML document
5. Parsing an XML document using DOM
6. Client side Programming
   # Programs of Javascript & VBscript of statements, functions, objects; event and event handling
   # Form Validation including text field, radio buttons, check boxes, list box and other controls.
7. Usage JSP objects response, Request, Application, Session, Server, ADO etc
   # Writing online applications such as shopping, railway/air/bus ticket reservation system with set of JSP pages
   # Using sessions and cookies as part of the web application
8. Writing Servlet Program using HTTP Servlet
9. PHP of simple program, if-else, loop, switch, array, function, form, mail, file upload, session, error, exception, filter, PHP-ODBC.
10. Any online application with database access
11. Sample web application development in the open source environment

SEMESTER-V

BITC11	Windows Programming	70

Windows Programming either using VB or C#

Module-I: Introduction to .NET Framework: What is .NET Framework?

Module-II: Data types, Literals and Variables: Types of data types, literals and variables.

Module-III: Operators and Control statements: Different types of operators, Control Statements- If, Switch, loops- for, while, do- while, for each, break, exit, and return.

Module-IV: Forms and Events: Create form control**,** Validating User Input, Delegates and Events.

Module-V: Database Connectivity: database connectivity using ADO.NET using Access, Oracle or SQL server.

Module VI: Reports: Create a report in .NET.

Books:

1) Jeffrey R. Shapiro –Visual Basic.net The Complete Reference - TMH- April 4, 2002
2) Herbert Schildt- C# 3.0- The Complete Reference- McGraw Hill Professional, 2008

BITC12	Data Communications & Computer Networks	70

Module-I: Introduction to data communication and networking, Network models: Components of data communication, data flow, topology-bus, ring, star, hybrid, protocols and standards, The OSI reference model, Layers in OSI reference model, TCP/IP protocol suite

Module-II: Media and Transmission modes: Data and signals, Periodic analog signals, Digital signals , Transmission impairment , Digital to digital, Analog to digital conversion, Transmission modes, Digital to analog conversion, Analog to analog conversion, Guided media and Unguided media.

Module-III: Switching and routing algorithms: Switching basics, circuit switching, packet switching and Message switching. datagram networks and virtual circuit networks, routing algorithms- distance vector routing and link state routing Information Encoding, Error Detection and Correction Introduction, representing different symbols, Minimizing errors, Error classification, types of errors, redundancy, detection versus correction, hamming distance, cyclic redundancy check, checksum and Flow control.

Module-IV: IP: IPV4 addressing, IPv6 addresses, IPv6 header formats, IPv6 extension headers, IPv6 auto configuration.

Module-V: Network Security: Requirements, conventional encryption, public key encryption & digital signatures.

Books:

1) A. Behrouz Forouzan, Data communications and Networking, McGraw-Hill Education, 2006.
2) William Stallings, Data and Computer Communications, Pearson Education India, 2007, Eighth Edition.

BITC(P)-5	**Lab on Windows Programming & Network**	**60**

Windows Programming

Decision Structures and Loops, Events, Delegates: Forms Controls, Switch, If-else, Loops, Validating User Input, Delegates and Events

Using ADO.NET: Use ADO.NET with a Windows Forms application to create, read, update, and delete records in Access and SQL Server databases.

Reports Generations: Visual Studio Reports, Crystal Reports, Deploying Applications

Network

Socket Programming using C/C++/Java.

DSE1	**Elective1**	**70**

Decision Support System

Module-I:

Introduction to DSS defined, Ingredients of a DSS, Data and Model Management, DSS knowledge Base, User Interfaces, The DSS User, Categories and classes of DSS.

Module-II:

Decisions and Decision Makers: Decision Makers, Decision Styles, Decision Effectiveness, How can a DSS help? Topologies of Decisions. Decision in the Organization: Understanding the Organization, Supporting Organizational Decision Making.

Module-III:
Modeling Decision Processes: Defining the problem and its structure, Decision models, Types of Probability, Techniques for forecasting Probabilities, Introduction to Artificial Intelligence as expert system.

Module-IV:
Designing and Building Decision Support Systems: Strategies for DSS Analysis and Design, The DSS Developer, Tools for DSS Development.

Module-V:
Implementing and Integrating Decision Support Systems: DSS Implementation, System Evaluation, the Importance of Integration.

Module-VII:
Decision Support in the Twenty – First Century: The Future of Decision Support Systems, The future of Expert and Artificial Intelligence Systems.

Books:
1) George M. Marks-Decision Support Systems in the 2151 Century, 2nd Edition, Pearson Education, 2006.

Reference Books:
1) Efrain Turban- Decision Support Systems and Intelligent System, Eight Edition, Pearson Education, 2006.

DISTRIBUTED DATABASES

Module–I: Introduction to Distributed Data Processing: Advantages of DDB's, Problem areas.

Module–II: Distribute Database Management System Architecture: DBMS Standardization, Architectural models for DDBMS Distribute DBMS Architecture.

Module–III: Distributed Database Design: Design Strategies, Distribution design issues, Fragmentation, Allocation.

Module–IV: Semantic Data Control: view management, data security, Integrity control.

Module–V: Query processing and Optimization: Quarry Processing Problem, Characterization of Query Processors, Layers of query Processing, Query decomposition, Query Optimization.

Module–VI: Transaction Management and Concurrency Control: Introduction, Properties, Serializability Theory, Locking Based Concurrency control Algorithm, Time Stamp based concurrency control Algorithms, Dead Lock management.

Module–VII: Recovery and Reliability: Failures and fault tolerance in distributed system, Distributed & local reliability protocol, Sits failures, network partitioning.

Books:

1) M. Tamer Ozsee, PatricValduriez - Principle of Distributed Database Systems 2ndEdn. Pearson Education Asia, 2001.

DSE2	Elective2	70

Data Mining & Warehousing

Module-I: Introduction: Basic Data Mining Tasks, Data Mining versus knowledge Discovery in Databases, Data Mining Issues, Data Mining Metrics, Social Implications of Data Mining, Data Mining from a Database Perspective.

Module-II: Data Mining Techniques: Introduction, Similarity Measures, Decision Trees.
Classification: Introduction, Distance-Based Algorithms, Decision Tree-Based Algorithms.
Clustering: Introduction, Similarity and Distance Measures, Outliers, Hierarchical Algorithms, Partitional Algorithms (Minimum Spanning Tree, K-Means Clustering, Nearest Neighbor Algorithm).

Module-III: Association Rules: Introduction, Large Item-sets, Basic Algorithms.
Data Warehousing

Module-IV: The Data Warehouse Environment: The Structure of the Data Warehouse,Subject Orientation, Day 1-Day *N* Phenomenon, Granularity, Exploration and Data Mining, Living Sample Database , Partitioning as a Design Approach, Structuring Data in the Data Warehouse, Cost Justification, Data Homogeneity/Heterogeneity, Purging Warehouse Data.

Module-V: The Data Warehouse and Design: Beginning with Operational Data, Data/ProcessModels and the Architected Environment, The Data Warehouse and Data Models, Meta Data.
Granularity in the Data Warehouse: Raw Estimates, Input to the Planning Process, Data in Overflow?

Module-VI: The Data Warehouse and Technology: Managing Large Amounts of Data,Managing Multiple Media.

Books:
1) M H Dunham & S. Sridhar-Data Mining: Introductory and Advanced Topics, Pearson Education, 2006.
2) W H Inmon: Building the Data warehouse, 3rdEdn, Wiley Dreamtech India (P) Ltd., 2003.

Reference Books:
1) S. Anahory & D. Murray-Data Warehousing, Pearson Education, New Delhi-2000.

Cloud Computing

Module-I: Overview of Computing Paradigm: Recent trends in computing: Grid computing cluster computing, Distributed Computing, Utility Computing, Cloud Computing.

Module–II: Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, benefits and limitations of cloud computing.

Module–III: Cloud Computing Architecture: Comparing with traditional computing architecture (client/server), Service provided at various levels, Service models- Infrastructure as service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing works, Deployment models-public cloud, Private cloud, Hybrid cloud, Community cloud.

Module–IV: Cloud Security: Infrastructure security-Network level security, Host level security, Application level security, Data security and storage- Data privacy and security issues, Jurisdictional issues raised by data location, authentication in cloud computing.

Books:
Cloud computing Bible, Barrie Sosinsky, Wiley India, 2010

DSE(P)-1	**Lab on Elective**	**60**

Elective1

For DSS
Using Open Source DSS tool.

For Distributed Database
Transaction control using SQL or PL/SQL.

Elective2

Data Mining & Warehousing

Using Open Source Data Mining tool.

Cloud Computing

Using Open Cloud Computing tool.

SEMESTER-VI

BITC13	**Computer Graphics & Multimedia**	**70**

Module-I: Overview of Graphics Systems: Video Display Devices, Refresh Cathode RayTubes, Raster-Scan and Random-Scan Systems, Input Devices, Hard-Copy Devices and Graphics Software.

Module-II: Output Primitives: Points, Line Drawing Algorithms (DDA and Bresenham's Line Drawing Algorithm), Circle- Generating Algorithms (Bresenham's and Midpoint Circle

Algorithms), Ellipse-Generating Algorithms (Midpoint Ellipse Algorithm only), Filled-Area Primitives: Scan –Line Polygon Fill Algorithm.

Module-III: Two Dimensional Geometric Transformations: Basic Transformations, Matrix, Representations and Homogeneous Coordinates, Composite Transformations, Reflection and Shear, Transformations between Coordinates Systems.

Module-IV: Two-Dimensional Viewing: The Viewing Pipeline, Viewing Coordinate ReferenceFrame, Window-to-View Port Coordinate Transformation, Clipping- Point, Line (Cohan-0Sutherland Line Clipping and Liang –Barsky Line Clipping).

Module-V: Three Dimensional Geometric Transformations: Translation, Rotation, Scaling, Reflection and Shears, Composite Transformations, Modeling and Coordinate Transformations.

Module-VI: Multimedia Systems Design: Multimedia Elements, Multimedia Applications, Multimedia System Architecture, Evolving Technologies for Multimedia Systems, Multimedia Data Interface Standards, the Need for Data Compressions.

Books:

1) D. Hearn & M. P. Baker -Computer Graphics C Version, 2nd Edn, Pearson Education, New Delhi, 2006
2) J. F. KoegelBuferd -Multimedia Systems, Pearson Education, New Delhi, 2006

Reference Books:

1) R.A. Plastock et.al.- Computer Graphics (Schaums Outline Series), 2nd Edn, TMH, New Delhi, 2006.
2) J.D.Foley- Computer Graphics, 2nd Edn, Pearson Education, New Delhi, 2004

BITC14	**Advanced Web Programming**	**70**

Module-I: The .NET Learning the .NET languages, Types objects and Namespace, Setting up ASP.NET and IIS.

Module-II: ASP Applications, Web Form Fundamentals, Web controls, Using Visual Studio.NET.

Module-III: Validation and Rich Controls, A Simple Validation Example.

Module –IV: Overview of ADO NET, Characteristic of ADO NET, The ADO NET Object Model.

Module-V: Database Connectivity: Data Access, SQL Update statement, Select commands, Data Binding.

Books:

1) Matthew MacDonald-ASP.net the Complete Reference- McGraw-Hill, 2002

BITC(P)-6	**(Lab on Computer Graphics & Advanced**	**60**

	Web Programming)	

Topics to be covered: Shape, Line Polygon Fill, Boundary-Fill, Flood Fill, Line Clipping, Polygon Clipping

Topics to be covered: use of controls like-textbox, button etc and apply events, validation and database connectivity.

DSE3	**Elective3**	**70**

INFORMATION SECURITY

Module-I: Information Security - Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, SDLC, Security SDLC

Module-II: Cryptography: Classical Cryptography, Symmetric Cryptography, Public Key (Asymmetric cryptography), Modern Cryptography. Forensics: DRM technology (including watermarking and fingerprinting of images, video and audio), Steganography, Biometrics

Module-III: Network Security: Network Protocols, Wireless Security (WiFi, WiMAX,Bluetooth, cell phone), IDS and Network Intrusion Management

Module-IV: Application Security: Email Security, Web Security, and Database Security, Secure Software Development, VoIP Security

Module-V:Information Security Threats: Viruses, Worms and other malware, Email Threats, Web Threats, RFID, Identity Theft, Data Security Breaches, Hacking Tools and Techniques

Books:

1. W. Stallings, Cryptography and Network Security: Principles and Practice, 6th Edition, Prentice Hall, 2013
2. Neil Daswani, Christoph Kern, Anita Kesavan, " Foundations of Security: What Every Programme", APRESS, 2007.
3. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House,2003.

ELECTRONIC COMMERCE & APPLICATION

Module-I: Introduction to E-commerce: E-commerce: The revolution is just beginning, The visions and forces behind E-commerce, Understanding E-commerce.

Module-II: E-commerce business models and concepts: E-commerce business models,Major business-to-consumer (B2C) business models, Major business-to-business (B2B) business models, Business models in emerging E-commerce areas, How the internet and the Web change business.

Module-III: E-commerce infrastructure: The Internet, Technology background, The internettoday, The world wide web.

Module-IV: Building an E-commerce web site: A systematic approach, choosing server software, choosing the hardware for an E-commerce site, other E-commerce site tools.

Module-V: Security and Encryption: The E-commerce security environment, Security threats in the E-commerce environment, Technology solutions, Policies, Procedures and Laws.

Module –VI: E-commerce payment systems: Payment systems, Credit card E-commerce transactions, E-commerce digital payment systems in the B2C arena, B2B payment systems.

Module – VII: Ethical, Social, and Political issues in E-commerce: Understanding ethical, social, and political issues in E-commerce, Privacy and information rights, Intellectual property rights, Governance, Public safety and welfare.

Books:

1) K.C. Laudon& C.G. Traver, E-commerce, Pearson Education, 2003

Reference Books:

1) R. Kalakota&A.B.Whiilston-' Frontiers of Electronic Commerce, Pearson Education- 2006.
2) K.K.Bajaj&D.Nag- E-Commerce, Tata McGraw Hill, New Delhi, Second Edition.

DSE(P)-2	**Lab on Elective**	**30**

Information Security

Implement cryptography techniques to data.

ELECTRONIC COMMERCE & APPLICATION

Design a E-Commerce application.

DSE-4	**Project**	**100**

Topics to be covered: use any front end and backend to make project. (Note-MS-Access is not allowed as backend)

Project-70 Marks and Viva-30 Marks.