CMJ UNIVERSITY, SHILLONG
REGULATION FOR BCA
Duration – Three Years
Eligibility - 10+2 in any stream

Scheme of Distribution of Marks

Sr. No.	First Year	Internal Assessment Marks	Term End Examination	Total Marks	Passing Marks
1	It Tools And Applications	30	70	100	40
2	Communication Skills	30	70	100	40
3	Programming In C	30	70	100	40
4	Internet Technologies & Applications	30	70	100	40
5	Database Management System	30	70	100	40
6	Environmental Science	30	70	100	40
Sr. No.	Second Year	Internal Assessment Marks	Term End Examination	Total Marks	Passing Marks
1	Introduction To C++ Programming	30	70	100	40
2	Software Engineering	30	70	100	40
3	Java	30	70	100	40
4	Visual Basic	30	70	100	40
5	Management Information System	30	70	100	40
6	Computer Graphics And Multimedia	30	70	100	40
Sr. No.	Third Year	Internal Assessment Marks	Term End Examination	Total Marks	Passing Marks
1	Computer Peripherals And Maintenance	30	70	100	40
2	Operating System	30	70	100	40
3	System Analysis And Designing	30	70	100	40
4	Relational Database Management System	30	70	100	40
5	Internet Programming	30	70	100	40
6	Data Warehousing	30	70	100	40
7	Project And Viva Voce				

BCA First Year

IT TOOLS AND APPLICATIONS
BCA -101

Unit I

INTRODUCTION TO COMPUTERS, NUMBER SYSTEMS AND BOOLEAN ALGEBRA

Definition-Characteristics-Historical Evolution of Computers-Classification of Computers-Digital Computers Generations of Computers-Model of Digital Computer-Functioning of a Digital Computer-Why Computers are Useful?-Human VS Computer-Applications-Number System-Conversions-Decimal to Binary Conversion-Decimal to Octal-Decimal to Hexadecimal-Binary System to Other Number Systems-Binary to Hexadecimal-Octal Number System to Other Systems-Hexadecimal System to Other Systems-Character Codes-Concept and Requirement of Boolean algebra

Unit II

SOFTWARE CONCEPTS, SOCIAL CONCERNS and APPLICATIONS OF COMPUTERS

Types of Software-Assembler-Compilers-Loaders and Linkage Editors-Functions of an Operating System - Types of Operating Systems-What is an Operating System?-Functions of an Operating System-Operating System as Resource Management. BIOS-Positive and Negative Impacts of Computer Technology-Viruses and their Types-Classification of Virus-Effects of Viruses-Computer Crimes-Business Education-Science-Engineering

Unit III

INTRODUCTION TO MICROSOFT WORD 2000

Introduction to Microsoft Word 2000-Standard Toolbar-Applying Wordwrap-File Menu-Edit Menu-View Menu-Insert Menu-Format Menu-Tools Menu-Table Menu-Macro-Editing of Word Document-Text Formatting-Paragraphs Formatting-Text Animation-Tables in Microsoft Word 2000

Unit IV

MICROSOFT EXCEL 2000

Introduction to Microsoft Excel 2000-Edit Menu-View Menu-Insert Menu-Format Menu-Tools Menu-Data Menu-Excel Short Cut Keys-Working with Toolbar –Formulas-Insert Chart-Formatting-Data Management

Unit V

MICROSOFT POWERPOINT 2000

Introduction to PowerPoint 2000-Slide Sorter View-Displaying the Slides-Power Point Slide Creation-Formatting-Adding Graphics-Customizing

COMMUNICATION SKILLS
BCA -102

UNIT I
COMMUNICATION SKILLS IN ENGLISH
Introduction-The Importance of English-English as the First or Second language-Uses of English-Other Uses of English-Presentation Skills

UNIT II
LISTENING SKILLS
What is Listening?- Types of Listening- Objectives-Active Listening- an Effective Listening Skill- Note Taking Tips- Barriers for Good Listening- Purpose of Listening- Outlines and Signposting- Gambits

UNIT III
READING SKILLS
Importance of Reading- Definition of Reading- Levels of Reading- Requirements of Reading- Types of Reading- Techniques of Reading- Academic Reading Tips

UNIT IV
WRITING SKILLS
What is Writing? - The Sentence- The Phrase-Kinds of Sentences- Parts of Sentence- Parts of Speech-Articles- Types of Sentences - Time Management Tips- Test Preparation Tips - Tips for Taking Exams- What is a Paragraph?- Construction of Paragraph- Letter Writing- Memo- Cover Letter-Resume writing

UNIT V
COMMUNICATION SKILLS- SPEAKING SKILLS
Definition- Barriers of Communication- Types of Communication- Know What You Want To Say

PROGRAMMING IN C

BCA 103

Unit-I

INTRODUCTION TO PROGRAMMING

Introduction to Problem Solving **-** Top-Down Design **-** Algorithm **-** Characteristics of Algorithm **-** Implementation of Algorithm **-** Analysis and Efficiency of Algorithm **-** Fundamental Algorithms **-** Array Techniques **-** Searching, Sorting and Merging Techniques **-** Text Processing and Pattern Search **-** Dynamic Data Structure Algorithms **-** Recursive Algorithms **-** Flow Charting **-** Flow Chart Types **-** Flowchart Symbols **-** Decision Table **-** Psudeocode - Pseudocode (Using user input, files, reports, and output on paper/console)

Unit-II

INTRODUCTIONS TO 'C' LANGUAGE; OPERATORS, INPUT/OUTPUT FUNCTIONS, CONTROLS & LOOPS

C Language: Constants, Variables, Programming Techniques - History of C Language - Features of C Language - Components of C Language - Structure of a C Program - Variables

Operators: Operators - Type Modifiers - Expressions - Type Definitions Using typedef

Input/Output Functions: Introduction to Input/Output - Console I/O Functions - Unformatted Console I/O Functions

Controls & Loops: Control Statements - Conditional Statements - Loops in C - The break Statement - The Continue Statement - The exit ( ) Function - The goto Statement

Unit-III

ARRAYS, FUNCTIONS, POINTERS, STRUCTURES, FILE HANDLING

Arrays: Introduction to Arrays **-** One Dimensional Array **-** Strings **-** Two Dimensional Array **-** Multi-dimensional Array

Functions: Introduction to Functions - Function Declaration and Prototypes - Function Definition - Storage Classes - Scope and Lifetime of Declaration - Passing Parameters to Functions - Command Line Arguments - Recursion in Function

Pointers: Introduction to Pointers - Pointer Notation - Pointer Declaration and Initialization - Accessing Variable through Pointer - Pointer Expressions - Pointers and One Dimensional Arrays - Malloc Library Function - Calloc Library Function - Pointers and Multi-dimensional Arrays - Arrays of Pointers - Pointer to Pointers - Pointers and Functions - Functions with a Variable Number of Arguments

Structures: Structure Definition **-** Giving Values to Members **-** Structure Initialization **-** Comparison of Structure Variables **-** Arrays of Structures **-** Array within Structures **-** Structures within Structures **-** Passing Structures to Functions **-** Structure Pointers

File Handling: What is a File? - Defining and Opening a File - Closing a File - Input/Output Operations on Files - Functions for Random Access to Files - Example Programs

Unit-IV

PREPROCESSORS, INTRODUCTION TO DATA STRUCTURE, ARRAY TECHNIQUES, QUEUES AND STACKS

Preprocessors: Introduction to Preprocessors - Macro Substitution (#define) - Undefining a Macro (#undef) - File Inclusion - Conditional Compilation Directives (#if, #else, #elif, #endif, #ifdef, #ifndef) - Header Files

Data Structures: Introduction **-** Data and Information **-** Primitive and Composite Data Types **-** Abstract Data Type **-** Introduction to Algorithm Design

Array Techniques: Linear Data Structures - Operations on Linear Data Structures –

Arrays - Memory Representation of One-Dimensional Array - Memory Representation of Two Dimensional Arrays - Memory Representation of Three Dimensional Array - Memory Representation of Multidimensional Array

Queues and Stacks: Introduction **-** Queues **-** Circular Queue **-** Deques **-** Priority Queues **-** Application of Stacks

UNIT-V

LINKED LIST

Static and Dynamic Memory Allocation **-** Pointers **-** Static and Dynamic Variables **-** Linked Linear List **-** Representation of Linked List **-** Implementation of Linked List **-** Concatenation of Linked Lists **-** Merging of Linked Lists **-** Reversing of Linked List **-** Applications of Linked List **-** Doubly Linked Lists **-** Circular Linked List **-** Generalised List

INTERNET TECHNOLOGIES & APPLICATIONS
BCA -104

UNIT-I

OVERVIEW OF INTERNET TECHNOLOGY, OSI REFERENCE MODEL AND TCP/IP

Introduction - Brief History of Internet - Present Scenario of Internet - Future of Internet - Hardware and Software Requirements for Internet - Protocols Used for Internet - Internet Service Providers - Internet Accounts - Host and Terminals - ISDN - Home-Page - URL - Web-Browsers - Internet Explorer - Surfing the Net - Applications of Internet - Security threat on Web - Internet Authorities. ISO OSI Reference Model - Working of OSI Layers - YCP/IP Reference Model - OSI Versus TCP?IP Reference Model - Organisation For Standards

UNIT-II

NETWORK AND TRANSPORT LAYERS: FUNCTIONS AND PROTOCOL, INTERNET PROTOCOLS, ROUTING ALGORITHMS AND MULTIPLEXING

Network Layer Functions - Network Services - Working of Network Layer - Transport Layer Services and Functions - TCP/IP Protocols Classification - X.25 Network - X.25 Protocol Suite - Switching Networks - Circuit-switched Network - Packet-switched Network - Packet Switching Considerations - Circuit Switching Techniques - Routing and Control Signalling - Packet Switching - Packet Switching Techniques - Congestion Control - Comparison of Circuit Switching and Packet Switching. Introduction - Internet Protocol (IP) - IP Addressing - IP Subnet Addressing - Address Resolution Protocol (ARP) - Internet Routing - IP Routing - Internet Control Message Protocol (ICMP) - ICMP Router-Discovery Protocol (IDRP) - Transmission Control Protocol (TCP) - User Datagram Protocol (UDP) - Protocols and Ports - Sockets - Transport Level Interface (TLI) - Routing Algorithms - Types of Routing Algorithms - Routing Strategies - Congestion Control Algorithms - Congestion Control Method For Virtual Circuits And Datagram - Multiplexing - Types of Multiplexing

Unit-III

APPLICATION LAYER SERVICES AND PROTOCOLS; WORLD WIDE WEB AND INTERNET TOOLS

Introduction - Application-Layer Internet Protocols - Telnet - File Transfer Protocol - Types of FTP Server - Working With FTP server - Simple Mail Transfer Protocol - Simple Network Management Protocol - Domain Name Service - NFS and RPC Protocols - XDR Protocol - X Windows Protocol. World Wide Web (WWW) - Web Browsers - Web Pages in Other Languages - Browsing the Web - Downloading Information Using Internet - Web Search Engines - Search Engine (ALTA VISTA) - Gopher - Veronica - MOSAIC - WAIS - Internet Relay Chat (IRC) - Web-Chat - E-Mails - E-Mail Packages - Pine - Eudora - Outlook - Mailing Lists - Usenet Newsgroup

Unit-IV

WEB AUTHORING AND HTML TECHNIQUES

Creating a Web Page - Document Organisation Types - Creating HTML Documents - Linking Web Pages - Publishing HTML Documents on Web - Publishing Website - HTML - Structure of HTML Documents - HTML Example - HTML Layout Techniques - Basic Structure of HTML Document - Footer - Text Formatting & Alignment - Font Control - Arranging Text in Lists - Images in Web Pages - Tables - Background Images & Colors - Forms – Frames

UNIT-V

SERVER-SIDE PROGRAMMING, CGI AND PEL PROGRAMMING

Server-side Programming - Applications of Server-side Programming - Types of Server-side Programming - Client-Server Models - Common Gateway Interface (CGI) - CGI Programming Languages - Structure of a CGI Script - Environment Variables - Creating CGI Applications - making CGI Applications Accessible - Example: Program in CGI and PERL - CGI Security Issues - CGI Script Command Line - Data Input to the CGI Script - Protocol-Specific Metavariables - Data Output from CGI Script - Client-side Programming - Other Scripting Languages - Brief Overview of Perl - Running Perl - Perl Command-Line Arguments - Perl Script

DATABASE MANAGEMENT SYSTEM

BCA -105

Unit I

Introduction to Database System and Database Models

Database System: Introduction - Objectives - Traditional file oriented approach - Motivation for database approach - Database Basics - Three views of data - The three level architecture of dbms - Database management system facilities - Elements of a database management system - Advantages and disadvantages of dbms - Self test – Summary

Database Models: Introduction - Objectives - File management system - Entity-relationship (e-r) diagram - The hierarchical model - The network model - The relational model - Advantages and disadvantages of relational approach - An example of a relational model - Self test - Summary

Unit II

File Organization for dbms and Representing Data Elements
File Organisation: Introduction - Objectives - File organization -Sequential file organisation - B-trees Direct file organization - Need for the multiple access paths - Self test –Summary

Representing Data Elements: Data elements and fields - Representing relational database elements - Records -Representing block and record addresses - Client-server systems - Logical and structured addresses - Record modifications - Index structures - Indexes on sequential files - Secondary indexes - B-trees - Hash tables - Self Test

Unit III

Relational Model and Normalization
Relational Model: Introduction **-** Objectives **-** Concepts of a relational model **-** Formal definition of a relation **-** The codd commandments **–** Summary

Normalization: Functional dependency **-** Normalization **-** Self test **–** Summary

Unit IV

Structured Query Language, Relational Algebra, Management Considerations

Structured Query Language: Introduction of sql - Ddl statements - Dml statements - View definitions - Constraints and triggers - Keys and foreign keys - Constraints on attributes and tuples - Modification of constraints - Cursors - Dynamic sql

Relational Algebra: Basics of relational algebra - Set operations on relations - Extended operators of relational algebra - Constraints on relations - Self test - Summary

Management Considerations: Introduction - Objectives - Organisational resistance to dbms tools - Conversion from an old system to a new system - Evaluation of a dbms - Administration of a database management system - Self test – Summary

Unit V

Concurrency Control and Transaction Management

Concurrency Control: Serial and serializability schedules - Conflict-serializability - Enforcing serializability by locks - Locking systems with several lock modes - Architecture for a locking scheduler - Managing hierarchies of database elements - Concurrency control by timestamps - Concurrency control by validation - Summary

Transaction Management: Introduction of transaction management - Serializability and recoverability - View serializability - Resolving deadlocks - Distributed databases - Distributed commit - Distributed locking - Summary

ENVIRONMENTAL SCIENCE

BCA -106

UNIT I

Ecosystem – Natural and man – made ecosystems with examples – Energy flow – Pyramids, food –chain and food –web – Productivity – Ecological efficiencies.

UNIT II

Natural Resources – Renewable – Forest management – Deforestation and A forestation – Protection of wild-life resources – Conservation projects

UNIT III

Energy Resources – Non – Renewable resources (mineral) – Conventional (Coal, petroleum) – Renewable – Non-conventional (Solar, wind) – conventional – Hydel, tidal powers, salinity, energy, geothermal and nuclear Power – Programmes in India.

UNIT IV

Pollution And Management – Sources effects and control of air, soil and water pollution – Heavy metals – Ground water and marine pollution – Noise pollution – Radio active pollution – Bioaccumulation – Biomagnifications.

UNIT V

Environmental Education – Principles, Programmes and status in India – Environmental organization and agencies – International bodies – Man and Biosphere programme (MAB) – Department of Environment.

BCA Second Year

INTRODUCTION TO C++ PROGRAMMING

BCA 201

UNIT I

BASICS OF C++

Beginning with C++: What is C++ - Applications of C++ - Structure of C++ Program – A Simple C++ Program – More C++ Statements – An Example with class. Tokens, Expressions and Control Structures: Introduction – Tokens – Keywords – Identifiers and Constants – Basic Data Types –User-defined Data Types – Derived Data Types – Symbolic Constants – Type Compatibility – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables –

UNIT II

C++ OPERATORS

Operators in C++ - Scope Resolution Operator – Member Dereferencing Operators – Memory Management Operators – Manipulators – Type Cast Operators – Expressions and Their Types – Special Assignment Expressions – Implicit Conversions – Operator Overloading – Operator Precedence – Control Structures – Functions in C++: Introduction – The Main Function – Function Prototyping – Call By Reference – Return By Reference – Inline Functions – Default Arguments – Const Arguments – Function Overloading – Friend and Virtual Functions.

UNIT III

CLASSES IN C++

Classes and Objects: Introduction – Specifying A Class – Defining Member Functions – A C++ Program with Class – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Memory Allocation For Objects – Static Data Members - Static Member Functions - Arrays Of Objects – Objects as Function arguments – Friendly Functions – Returning Objects – Const Member Functions – Pointers to Member – Local Classes. Constructors and Destructors: Introduction – Constructors - Parameterized Constructors-Multiple Constructors in a Class – Constructors with Default Arguments –Dynamic Initialization of Objects – Copy Constructor – Dynamic Constructors – Constructing Two Dimensional Arrays – Const Objects – Destructors .

UNIT IV

OPERATOR OVERLOADING AND TYPE CONVERSIONS

Operator Overloading and Type Conversions: Introduction – Defining Operator Overloading – Overloading Unary Operators - Overloading Binary Operators -Overloading Binary Operators using Friends - Manipulation of strings using Operators –Rules for Overloading Operators – Type Conversions – Inheritance Extending Class : Introduction - Defined Derived Classes – Single

Inheritance – Making A Private Inheritable - Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance –Hybrid Inheritance – Virtual Base Classes – Abstract Classes - Constructors in Derived Classes - Member Classes : Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Introduction – Pointers to Objects - This pointer – Pointer to Derived Classes – Virtual Functions – Pure Virtual Functions.

UNIT V

Console I/O Operations

Managing Console I/O Operations: Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Managing Output with Manipulators. Working With Files: Introduction – Classes For File Stream Operations – Opening and Closing a File – Detecting End of a File – More about Open(): File Modes – File Pointers and their Manipulations - Sequential Input and Output Operations – Updating a File: Random access – Error handling During File Operations – Command Line Arguments. Templates: Introduction – Class Templates – Class Templates With Multiple Parameters – Function Templates – Function Templates with Multiple Parameters – Overloading of Template Functions – Member Function Templates Exception Handling: Introduction – Basics of Exception Handling – Exception

SOFTWARE ENGINEERING

BCA 202

UNIT I

Introduction: Definition of software and software engineering software Myth software engineering paradigm. Software project management: Software matrix – cost estimation - project planning.

UNIT II

Software requirements analysis: Computer systems engineering - System analysis modeling the system architecture – System specification: Fundamentals of requirements analysis – The analyst – Problem areas – analysis principles – Software Prototyping specification; concept of requirements analysis methods – SADT; object oriented analysis and data modeling; Requirement analysis methods – Data structure oriented methods – Jackson system development specification techniques.

Software design: design fundamentals: dataflow oriented design: Object oriented design; data oriented design; real time system design - concepts, analysis and design.

UNIT III

Implementation: Programming languages characteristics Programming language fundamentals – classification – coding style p coding efficiency, Testing software testing techniques –testing fundamentals – white box testing – basis path testing control structure testing black box testing – testing for Real Time systems – Software strategies – approach – unit testing – Integration testing validation testing – System testing – Debugging techniques software quality assurance.

UNIT IV

Software maintenance – definition and characteristics – maintenance – task – side effects – reverse engineering and re-engineering; software configuration management. Computer aided software engineering (CASE): building blocks – project management tools – support tools analysis and design tools – programming tools – integration and testing tools – maintenance tools; integrated CASE environment (I – CASE)

UNIT V

Software Testing and Software Testing Techniques : Introduction-Verification and Validation-Software Testing And Its Relation With -Software Lifecycle-Significance and Potential of Software Testing-Principles of Software Testing-Software Testability And Its Characteristics-Stages in Software Testing Process-Types of Software Testing-Black-box Testing (BBT)-BBT Techniques-White-box Testing (WBT)-WBT Techniques

JAVA

BCA 203

UNIT I

Concepts of Object Oriented Programming
Basics of OOP's-Introduction-Object Oriented Paradigm-Basic concepts of Object Oriented – Programming-Object-Classes-Data Abstraction and Encapsulation-Inheritance-Polymorphism

Fundamentals of Java Language-Introduction to Java-Genesis of Java-Why Java?-History of Java-Oak-Java Feature-Simple-Secure-Portable-Object Oriented-Interpreted-Robust-Multithreaded-Interpreted-Dynamic and Distributed-Architecture Nature and Portable-Difference between java and C++-The Java Virtual Machine-Java Program Structure-Java Token-Identifiers-Keywords-Literals-Operators-Separators-Comments-White Space-Constants
Backslash Character Constant

Variables and Operators-Variables-Data Types in java-Scope of Variables-Array-One-Dimensional Array-Two-Dimensional Array-Strings-Operators-Arithmetic Operators-Assignment Operators-Conditional Operators-Special Operators-Relational Operators-Boolean Logical Operators-Incrementing and Decrementing –Operators-Bitwise Operators-Operator Precedence

UNIT II

Control Statements-Selection Statements-If-If. Else-If. Else If. Else-The Switch Statement
Iteration Statement-The while Statement-The do Statement-The for Statement-The Comma Operator-The break Statement-The continue Statement

Classes and Objects-Classes-The class Declaration-Declaring a class's Super class-Listing the interface implemented by a class-Summary of a class Declaration-Declaring Member –Variables-Declaring Constants-The Method Declaration-Object Creation and Constructors-Object Creation-Constructor-Controlling access to member of a class-Private-Protected-Public
Subclasses and Inheritance-Definition-Creating Subclasses-Overriding Methods-Final classes and Methods-Final Classes-Final Methods-Abstract classes and Methods-Abstract classes-Abstract Methods

Packages and Interfaces-Packages-How to create your own packages-Class path-The meaning of static -Cleanup: Finalization and Garbage collection-Forcing Finalization and -Garbage collection-Interfaces-What is an interface-The interface Declaration -Multiple Extension (Inheritance)-Implementing an interface-Using an interface as a type-Interfaces verses abstract classes

GUI Programming-Introduction to Applet Programming-What are Applets-What applet can do-What applet can not do-Types of an Applet-Local Applet-Remote Applet-Lifecycle of an Applet-Passing parameters to an Applet

UNIT III

Programming the Abstract Windowing Toolkit (AWT) Introduction of AWT-AWT Component Hierarchy-How to Add a Component to a Container-AWT Component-Labels-Buttons-Checkbox-Text Fields-Text Areas-Choice lists-Scrolling Lists-Event Handling-Introduction-Event Listener

Interfaces-How to implement event handlers-Buttons-Canvases-Checkboxes-Choices-Lists-ScrollPanes-TextComponent-Menus-AWT Containers-Frames-Panels-Dialogs-Layouts-The Flow Layout Class-The Border Layout Class-The Grid Layout Class-The Grid Bag Layout Class-The Card Layout class-Combining Layouts with Nested Panels-Using Adapters to Handle Events

JFC AND SWING COMPONENT -Introduction -Difference between AWT and Swing – Components-Overview of Component-All about Controls (Components)-Applet Example-Frame-Changing the Look and Feel (LAF)-Label-Button-New Feature in JDK 1.2.2-JtoolTip-JtextField-JcheckBox-Jpanel-JSlider Basics

UNIT IV

Advance Programming Element -Java Streams-What is Stream-Byte Stream-File Stream-Data Stream-Character Streams-Reading Text Files-Writing Text Files

Exception Handling-Introduction -What are Exception-Try/catch -The finally clause-The throws clause-The throw clause-User Define Exception

Java Database Connectivity-Getting started with JDBC-What is JDBC-JDBC Architecture-JDBC API Interface in a Nutshell-Driver Manager-Connection-Statement-Resultset-CallabelStatement-DatabaseMetaData-Driver-PreparedStatement-ResultSetMetaData-DriverPropertyInfo-Date-Time-TimeStamp-Types-Numeric-Driver Interface-Application Area. Getting to Work-How to configure ODBC Driver-Connecting to a database-Executing database –Queries-The Statement clause-The Result Set class-More Complex Uses of JDBC-The Prepared Statement class-The Callable Statement class-Working with Multiple Database - "DNS Less" Connection with the JDBC-ODBC "Bridge" Driver-MS Access Example-ODBC Driver for Oracle (from Oracle)-ODBC Driver for Oracle (from Microsoft)-ODBC Driver for Excel

UNIT V

Multithreaded Application -Introduction of Multithreading -What is a Thread-Creating New Threads-Sub classing the Thread class-Implementing the -Runnable Interface-Thread States-The Thread API-Scheduling and Priority-Setting -Thread Priority-Waking up a Thread-Suspending and Resuming Thread –Execution-Putting a Thread to Sleep

The Java util Package –Introduction-The Java collection Advantage: An Overview-A good API-Other Capabilities-Sorting a Collection-Un modifiable collection-Synchronized Collection

VISUAL BASIC

BCA 204

UNIT I

Visual Basic
What is Visual Basic?-Design-Time vs. Run-Time Environments-Projects & Forms-Working with VB Forms-Running a Project

Analyzing
An overview of the Visual Basic Development-Implementation of all the above steps through -A Simple Project-Creating the Project-Adding Controls to the Form-Setting Control Properties-Writing Event-Driven Code-Testing and Debugging the Sample Application-Converting Sample Application to Runtime

Controls and Properties
What is a Control?-Adding and Removing Controls-Label Control-Textbox Control-Command -Button Control-Shape Control-Line Control-List Box Control-Combo Box Control

UNIT II

Coding and Loops
Control and Loop Structures-Variable Declaration-Operators-Decision Structures-Loop Structures

Dialog Boxes
Displaying Dialogs-Creating a Modal Dialog Box-The Message Box-Common Dialog Boxes-Color Dialog Box-Font Dialog Box-The Print Dialog Box-The Input Box

UNIT III

Additional Controls
Option Buttons-Frames -Check Box -Scroll Bars -The Timer Control - Status Bar

Procedures and Functions
Sub Procedures-General Procedures-Event Procedures (Sub Head)-Function Procedures-Passing Arguments to Procedures-Passing an Array to A Function

Debugging Windows
Using Debugging Windows (The Immediate Pane)-To Add Debug. Print Statements To Track – Events-To Witness Events Form Birth Events Being Fired-To Watch User Interaction Events-To View the Form Shutdown Events-Using the Form Load Event-Unloading a Form

UNIT IV

Database Programming
Database Management-Data Access Object-Data Binding-Data Control and the Data Bound – Controls-Using Objects-Database Object-Recordset Object-Field Object-Crystal Reports - Crystal Report - Creating a Report-Using Crystal Reports in VB

UNIT V

Simple ActiveX Controls

ActiveX Controls-Image List Control-The Toolbar Control-The Cool bar Control - Image Combo – Control – Image List-The Month View Control-The List View Control-Tree View Control-Microsoft Masked Edit Controls-The Flat Scroll Bar Control-The Date Time Picker Control

MANAGEMENT INFORMATION SYSTEM

BCA 205

UNIT I

INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS
An overview of MIS-Computer-based User –machine system-Need for database-Subsystem of an MIS

ORGANIZATION STRUCTURE, ENVIRONMENT AND PERFORMANCE
Organization, Performance and Change-Problems of Defining Good Performance-Criteria for the Design of Structures-Organization and Performance-Reorganizing-Identifying a Need to Reorganize- 'Diagnosis'-Problems When Reorganizing (Solutions) -General Considerations in Implementing Reorganization-Points about Strategy and Structure -Organization and Environment -The 'Embeddedness' Of the Environment -Corporate Social Responsibility (CRC)-The Ecological Environment -Organizational Systems'-Management and Environments: Strategies and Processes

INFORMATION SYSTEM
Why Information Systems?-Contemporary Approaches to Information Systems-The New Role of Information Systems in Organizations-Learning to Use Information Systems: New Opportunities with Technology

UNIT II

THE STRATEGIC ROLE OF INFORMATION SYSTEMS
Key System Application in the Organization-Information Systems and Business Strategy-Using Systems for Competitive Advantage: Management Issues

INFORMATION SYSTEMS, ORGANIZATIONS, AND BUSINESS PROCESSES
The Relationship between Organizations and Information Systems-Salient Features of Information Systems-How Organizations Affect Information Systems-How Information Systems Affect Organizations

UNIT III

MANAGING INTERNATIONAL INFORMATION SYSTEMS
The Growth of International Information Systems-Organizing International Information Systems-Managing Global Systems-Technology Issues and Opportunities

ETHICAL AND SOCIAL IMPACT OF INFORMATION SYSTEMS
Understanding Ethical & Social Issues Related To Systems-Ethics in an Information Society-The Moral Dimensions of Information Systems

UNIT IV

MANAGING KNOWLEDGE

Knowledge Management in the Organization-Information and Knowledge Work Systems-Artificial Intelligence-Other Intelligent Techniques

INFORMATION, MANAGEMENT, AND DECISION MAKING

What Managers Do?-Introduction to Decision Making-Individual Models of Decision Making-Organizational Models of Decision Making-How Information Technology Has Changed the Management Process

UNIT V

PROBLEM SOLVING AND DECISION MAKING

Problem-Solving and Decision-Making Process-Consideration of Individual Differences-Personality Type and Problem Solving-Temperament-Problem-Solving Techniques-Integrating Techniques into the Problem-Solving Process

ENHANCING MANAGEMENT DECISION MAKING

Decision-Support Systems-Group Decision-Support Systems-Executive Support

INFORMATION SYSTEMS SECURITY AND CONTROL

System Vulnerability and Abuse-Creating a Control Environment-Ensuring System Quality

COMPUTER GRAPHICS AND MULTIMEDIA

BCA 206

UNIT I

Overview of Computer Graphics: Aims and Objective - Introduction - Computer Display - Random Scan - Raster Scan - Display Processor - Let us Sum Up - Lesson-end Activities - Points for Discussion

Graphics Software Standards

Aims and Objectives - Introduction - Graphics Kernel System - PHIGS - OpenGL - Let us Sum Up - Lesson-end Activities - Points for Discussion

UNIT II

Graphic Input Devices: Aims and Objectives - Introduction - Keyboard - Mouse - Data gloves - Graphics Tablets - Scanner - Joy Stick - Light Pen - Let us Sum Up - Lesson-end Activities - Points for Discussion

Output Primitives: Aims and Objectives - Introduction - Points and Lines - Rasterization - Digital Differential Analyzer (DDA) Algorithm - Bresenham's Algorithm - Properties of Circles - Properties of ellipse - Pixel Addressing - Let us Sum Up - Lesson-end Activities - Points for Discussion

UNIT-III

Introduction to Multimedia: Definitions- CD ROM and the Multimedia Highway – Where to use Multimedia. Introduction to making Multimedia: The stages of a project – What you need – Hardware – Software – Creativity – Organization. Multimedia skills and Training: The team – Project manager, Multimedia designer, Interface designer, Writer video specialist, Audio specialist, multimedia programmer, producer, multimedia for the web, the sum of parts.

UNIT-IV

Multimedia H/W and S/W : Macintosh and windows production platforms- Macintosh versus windows, the Macintosh platform, the windows platform, Networking Macintosh and windows computers, connections, memory and storage devices, I/O devices-O/P Hardware, communication devices.

UNIT-V

Multimedia Authoring tools: Types of Authoring tools – card and page based Authoring tools – Icon based authoring tools – Time based Authoring Tools – Cross Platform Authoring Tools. Multimedia Building Blocks: Text - The power of meaning – About Fonts and Faces Using Text in multimedia – Computer and text.

BCA Third Year

COMPUTER PERIPHERALS AND MAINTENANCE

BCA 301

Unit – I

Introduction – PC – PC History – Fundamentals of Computer architecture Hardware devices, memory – types of memory – processor – Mother board

Unit – II

Bus Architecture-Peripherals – history of computer devices – keyboard – mouse – monitor – types of monitor – joystick – OMR – OCR – Barcode reader – Game controller – Touch screen – scanner – digital camera – wed camera and usage – Memory devices.

Unit – III

Printer – types of printers – Plotter – Multimedia devices – Sound card – Audio output devices – Optical Devices – CD/DVC drive and writer – Floppy and Floppy – device driver files.

Unit – IV

System Maintenance – Maintenance tools- Hand tool – soldering and de – soldering tools – meters – logic pulser – Memory maintenance – formatting – partition – fragmentation.

Unit – V

System power maintenance- SMPS – power protector's power back up – UPS – inverter – Active and Preventive Maintenance systems – system tools – Checking and repairing.

OEPRATING SYSTEM
BCA 302

UNIT I

Introduction to operating system: Introduction of operating system-quality of operation system-feature of operating system-architecture of operating systems-operations of os-classification of operating systems-evolution of operating system-serial processing – batch processing- Multi programming-types of operating system-single-user, single tasking -single-user, multi-tasking -multi-user, multi--tasking -real-time operating system-batch –timesharing-personal computing

Process management: Introduction-definition of a process-process concepts-process state -process scheduling-types of scheduler-long term -short term-medium term-scheduling and performance criteria-scheduling algorithms-FIFO-SJF-round robin-multilevel queue scheduling-priority based scheduling-multilevel feedback queue scheduling-multiple-processor scheduling-real-time scheduling

UNIT II

Introduction to virtual memory: Introduction-basic of virtual memory-objective-paging-demand paging-basic concept -process creation-page replacement-allocation of frames-thrashing Paging-pre paging-page sizing-inverted page table

Interprocess communication and synchronization: Process synchronization-introduction-mutual exclusion-semaphore-properties of semaphore-synchronization tool -classic problems of synchronization

UNIT III

Deadlock -introduction of deadlock-system model -deadlock characterization-deadlock prevention -deadlock avoidance -methods for handling

Memory Management-address binding-logical – versus physical – address space-dynamic – loading-dynamic linking and shared libraries-swapping-contiguous memory allocation-memory protection-memory allocation-fragmentation-paging-basic method-hardware support-segmentation-basic method-hardware-implementation of segment tables-segmentation with paging –multics-os/2 32-bit version

UNIT IV

File system interface-file concept-file attribute-file operations-access methods-sequential – access-direct access-other access methods-directory structure-single level directory-two level directories-tree-structured directory-acyclic-graph directories-file-system mounting-file sharing-multiple users-remote file systems-protection

Security-the security problem -user authentication -program threats-system threats -securing systems and facilities -intrusion detection -cryptography -computer-security-classifications-computer-security

UNIT V

UNIX: A sample login session -logging on-using the on-line man pages -using man and more - logging off- directory and file structure-file names -directories -the df program -your login directory -subdirectories -specifying files -protecting files and directories -the unix shell syntax - creating files - text editors -files as output and log files -logging your actions to a file -comparing files -searching through files - the system and dealing with multiple users -information about your processes -information about other people's processes - sending messages and files to other users - /usr/ucb/mail - pine - write - talk - addressing remote nodes - shortcuts -aliases - wildcards -directory specifications -environment variables -history -the .login and. cshrc files - job control -the fg and bg commands -starting jobs in the background - some common and useful unix commands for files

SYSTEM ANALYSIS AND DESIGNING

BCA 303

UNIT I

Contemporary Systems, Expert Systems, Problem Definition, Data Flow Diagrams, Data Dictionary, Process Organization and Interaction, Decision Tables and Decision Trees, Data Collection

UNIT II

Planning Alternatives, Feasibility and Proposal, Design Consideration, User and Management Involvement, Project Selection, System Feasibility, Preliminary Investigation of Project Selection, Selection of a System Plan, the Systems Proposal

UNIT III

System Cost and Benefit, Costs and Benefits Identification, Comparative Cost Analysis, Data Processing Cost

UNIT IV

Structured Design, Data Administration, Auditable System, Program Specification, Structured Walk troughs

UNIT V

Project Management & Development Standards, Project Control, Project Tools (Gantt Charts, PERT & CPM)

RELATIONAL DATABASE MANAGEMENT SYSTEM
BCA 304

Unit I

Introduction: Purpose of Database Systems - View of Data -Data Models - Database Languages - Transaction Management - Storage Management - Database Administrator - Database Users - Overall System Structure. Entity-Relationship Model: Basic Concepts –Keys - Entity-Relationship Diagram - Weak Entity Sets - Extended ER Features – Specialization - Generalization - Relational Model: Structure of Relational Databases: The Relational Algebra – Views

Unit II

SQL: Background - Basic Structure - Set Operations - Aggregate Functions - Null Values - Nested Sub queries - Derived Relations – Views - Modification of Database - Joined Relations - Data Definition Languages - Embedded SQL - Other SQL Features.

Unit III

Integrity Constraints: Domain Constraints - Referential Integrity – Assertions – Triggers - Functional Dependencies - Relational Database Design: Pitfalls in Relational Database Design – Decomposition - Normalization Using Functional Dependencies - Normalization Using Multivalued Dependencies - Normalization Using Join Dependencies. Object Oriented Databases: New Database Applications - The Object Oriented Data Model - Object Oriented Languages - Persistent Programming Languages.

Unit IV

Object Relational Databases: Nested Relations-Complex types and Object Orientation-querying with complex data types-Creation of complex values and objects-Comparison of Object-oriented relational databases.

Unit V

New Applications: Decision support systems-Data analysis-Data mining-Data warehousing-Spatial and Geographic Databases-Multimedia Databases-Mobility and personal Databases-Information-retrieval systems-distributed information systems-The World wide Web.

INTERNET PROGRAMMING

BCA 305

Unit I

Introduction to Internet Technology

Introduction - Brief History of Internet - Present Scenario of Internet- Future of Internet - Internet Structure - Hardware and Software Requirements For Internet - Tour of Internet - Accessing the Internet - Protocols Used For Internet - Internet Service Providers - Internet Accounts - Host and Terminals – ISDN - Home-Page – URL - Web-Browsers - Internet Explorer - Surfing the Net - Applications of Internet - Security threat on Web - Internet Authorities

Unit II

World Wide Web and Tour of Internet Tools

World Wide Web (WWW) - Web Browsers - Web Pages in Other Languages - Browsing the Web - Downloading Information Using Internet - Web Search Engines - Search Engine (ALTA VISTA) – Gopher – Veronica – MOSAIC - WAIS - Internet Relay Chat (IRC) - Web-Chat - E-Mails - E-mail Packages – Pine – Eudora – Outlook - Mailing Lists - Usenet Newsgroup - Talk Facilities - Types of Internet Talk Facilities - Using Talk from Shell Account

Unit III

Internet Protocols, Addressing and Other Concepts

Introduction - TCP/IP Reference Mode - Internet Protocol (IP) - Internet Addressing - Subnets and Subnet Masks - IP Addressing Terminology - IP Version 6 (IPv6) - Files and File Types - Internet Media Types - File Extensions - Shell Account - Capabilities and Limitations of a Shell Account - Using Mail From Shell Account – Telnet - File Transfer Protocol - Types of FTP Servers - Working With FTP server - Domain Name Service

Unit IV

Introduction to .NET Technology

Introduction - Origin of .NET Technology - Overview of .NET framework - Features of. NET - Do's and Don'ts of. NET - Benefits of. NET - Limitations of NET

Unit V

C# Programming

Introduction - Features of C# - C# and .NET - Difference Between C# and C++ - Difference Between C# and Java - Creating a C# Program - Data Types in C# - Inheritance and Polymorphism - Abstract Classes and Methods - Interfaces - Arrays in C# - Strings - Properties and Indexers – Delegates - Delegates in Inheritance - Usefulness of Delegates – Attributes

DATA WAREHOUSING
BCA 306

UNIT I

Distributed Computing System, Evolution of Distributed Computing System, Distributed Computing System Models, Uses of Distributed Computed System, Introduction to Distributed Computing Environment-Introduction to Data Warehouse Concepts, Characteristics Of Data warehouse, Benefits Of Data warehouse.

UNIT II

Comparison Between A Database System And Data warehouse System, Environment Of A Data warehouse, The Concepts Used In Developing The Warehouse, Data Modeling, Data Models, Olap, Characteristics Of Olap, Olap Tools, Relational Olap, Oltp, Managed Query Environment-Strategy For A Data Warehouse, Design Of A Warehouse, Issues Related With Development Of Data warehouse, Metadata, The Process Of A Data Warehouse Design, Considerations Of Technology-Fact Table, Dimension Table, Granularity Or Grain Of Fact Table, Star Schema, Snow Flake Schema, Complexity Of Transformation And Integration.

UNIT III

Providing Data Access To The Enterprise, Operational Vs. Informational Systems, A Data Warehouse Architecture, Designing Data Warehouses,. Managing Data Warehouses, Data warehouse Team-Case Study

UNIT IV

Data Warehousing-Characteristics and Benefits of Data warehousing, Classification of Data Learning-Introduction, What is learning, Features and characteristics of educational software, A conceptual framework for the integration of learning technology. An Overview of Data Mining Techniques: Introduction, Classical Techniques: Statistics, Neighborhoods and Clustering, What is different between statistics and data mining?

UNIT V

Next Generation Techniques: Trees, Networks and Rules, The Next Generation, Decision Trees, Viewing decision trees as segmentation with a purpose, where can decision trees be used? Rule Induction, Discovery Data Mining and Customer Relationships, Relevance to a Business Process-Data Mining and Customer Relationship Management, Evaluating the Benefits of a Data Mining Model-From Data Mining to Database Marketing**:** Introduction, Data Mining vs. Database Marketing, What exactly is Data Mining? Who is developing the Technology? Conclusion Knowledge discovery process**:** Introduction, The knowledge discovery process in details, Data selection, Data Cleaning, Data Mining, OLAP Tools, Decision Table, Neural Network, Genetic Algorithm

BCA 307- PROJECT AND VIVA VOCE