

(B.C.A) Bachelor of Computer Application

SEMESTER -III

BCA 3001 PROBABILITY & STATISTICS

Probability: Introduction, Events & Different Types of Events, Addition & Multiplication Law, Conditional Probability, Bay's Theorem.

Probability Distribution: Random Variables, Probability Function, Binomial Poison & Normal Distribution.

Statistics: Definition, Function & Scope of Statistics.

Measures of Central Tendency: Arithmetic Mean, Weighted A.M., Median, Mode, Geometric & Harmonic Mean and Their Merits & Demerits.

Measures of Variation: Range, The Interquartile Range or Quartile Deviation, Average (Mean), Deviation Standard Deviation, Coefficient of Variation, Skew ness, Moments & Kurtosis.

Correlation Analysis: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient.

Regression Analysis: Difference Between Correlation & Regression, Regression Lines, Regression Equations, Regressions Coefficient.

Sampling Distribution: Chi Square (X^2) Distribution and Its Properties, Chi - Square Test, Application of Chi -Square Distribution: Chi-Square Test for Population Variance, Chi- Square Test of Goodness of Fit, Independence of Attributes, T- Distribution & Its Properties, Application of T - Distribution to Testing Hypothesis About Population Mean, Difference Between Two Means, Correlation Coefficient, F- Distribution.

Text Books:

1. S.P. Gupta & M.P. Gupta, "Business Statistics", Sultan Chand & Sons.
2. S.C. Gupta & V.K. Kapoor, "Fundamental of Mathematical Statistics", Sultan Chand & Sons.

BCA 3002 LOGIC DESIGN

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.

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.

Gate - Level Minimization: The Map Method, Four - Variable Map, Five - Variable Map, Product of Sums Simplification, Don't - Care Conditions, NAND and NOR Implementations, Other Two- Level Implements, Exclusive - OR Function.\

Combinational Logic: Combinational Circuits? Analysis Procedure, Design Procedure, Binary Adder - Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers

Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure.

Registers and Circuits: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters.

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

Text Book:

1. M.Morris Mano- Digital Design, 3rd Edn, Pearson Education, New Delhi - 2005.

Reference Book:

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

BCA 3003 ELECTRONIC COMMERCE & APPLICATIONS

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

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.

E-commerce infrastructure: The Internet: Technology background, The internet today, The world wide web.

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.

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

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

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.

Text Book:

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

Reference Books:

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

3. **BCA 3004 PROGRAMMING IN JAVA**

Java Evolution and Overview of Java Language: How Java differs from C and C++, Java and Internet, Java and World Wide Web, Introduction, Simple Java Program, More of Java, An Application with Two Classes, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style.

Constants, Variables, and Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values of Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values.

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evolution of Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions, Operator Precedence and Associativity, Mathematical Functions.

Decision Making and Branching: Introduction, Decision Making with if Statement, Simple if Statement, The if... else Statement, Nesting of if ... else Statements, The else if Ladder, The switch Statement, The ?: Operator.

Decision Making and Looping: Introduction, The while Statement, The do Statement, The for Statement, Jumps in Loops, Labelled Loops.

Classes, Objects and Methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a. Class, Overriding Methods, final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control.

Arrays, String and Vectors: Arrays, One-Dimensional Arrays, Creating an Array, Two-Dimensional Arrays, Strings, Vectors, Wrapper Classes.

Interfaces: Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables.

Packages: Putting Classes Together: Introduction, Java API Packages, Using system Packages, Naming Conventions, Creating Packages, Accessing a Packages, Using a Package, Adding a Class to a Package, Hiding Classes.

Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization.

Managing Errors and Exceptions: Introduction, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging.

Applet Programming: Introduction, How Applets Differ from Application, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, More About AppletTag, Passing Parameters to Applets.

Managing Input/Output Files in Java: Introduction, Concepts of Streams Stream Classes, Byte Stream Classes, Character Stream Classes, Using Streams, Other Useful I/O Classes, using the File Class, Input/Output Exceptions, Creation of Files.

Text Book:

1. E. Balagurusamy, Programming with Java, A Primer Second Edition, Tata McGraw Hill, New Delhi .

Reference Books:

1. H.M.Deitel & P.J.Deitel- JA V A- How to Program, 5th Edn, Pearson Education, New Delhi-2004.
2. P.Naughton and H. Schildt-JAVA: The Complete Reference, TMH, New Delhi 2005.
3. D.Jana- Java and Object Oriented Programming Paradigm, PHI, New Delhi-2005.

BCA 3005 PROGRAMMING IN VISUAL BASIC

Integrated Development Environment: Introduction, Integrated Development Environment Overview, Project Window, Toolbox, Form Layout Window, Properties Window, Menu Bar and Tool Bar, A Simple Program: Displaying a Line of Text.

Introduction to Visual Basic Programming: Introduction, Visual Programming and Event-Driven Programming, A Simple Program: Printing a Line of Text on the Form, Another Simple Program: Adding Integers, Memory Concepts, Arithmetic, Operator Precedence, Decision Making: Comparison Operators.

Control Structures: Introduction, Algorithms, Pseudocode, Introduction to Control Structures, If/Then Selection Structure, If/Then/Else Selection Structure, While Repetition Structure, Do While Repetition Structure, Do Until Repetition Structure, Essentials of Computer- Controlled Repetition, For Repetition Structure, Examples Using the For/Next Repetition Structure, Select Case Multiple-Selection Structure, Do/Loop While Repetition Structure, Do/Loop Until Repetition Structure, Exit Do and Exit For Statements, Data Type Boolean, Constant Variables, Logical Operators, Structured Programming Summary, Visual Basic Data Types.

Sub Procedures and Function Procedures: Introduction, Form Modules, Sub Procedures, Function Procedures, Call-by-Value vs. Call-by-Reference, Exit Sub and Exit Function, Storage Classes, Scope Rules.

Arrays: Introduction, Arrays, Declaring Arrays, Examples Using Arrays, Passing Arrays To Procedures, Sorting Arrays, Searching Array: Linear Search and Binary Search, Multidimensional Arrays, Control Arrays, Dynamic Arrays, Variable Arguments: ParamArray, Function Array.

Strings, Dates and Times: Introduction, Fundamentals of Characters and Strings, String Data Type, String Concatenation with & and +, Comparing Character Strings, Operator Like, Manipulating the Individual Characters in a String: Mid\$, Left\$, Right\$, and InStr, Searching for Substrings in String Using InStr and InStrRev, Ltrim\$, Rtrim\$, and Trim\$, Sting\$ and Space\$, Replacing Substrings in a String with Function Replace, Reversing Strings with Function StrReverse, Converting Strings to Uppercase and Lowercase, Conversion Functions, String Formatting, Date and Time Processing, Date and Time Formatting, String Arrays.

Basic Graphical User Interface Concepts: Introduction, Controls, TextBox Control, MaskEdit Control, ComboBox Control, ListBox Control, Scrollbars, Slider Control, Menus, Pop-Up Menus, Function MsgBox.

Advanced Graphical User Interface Concepts: Introduction, Multiple Document Interface (MDI), Multiple Forms.

Mouse and Keyboard: Introduction, Changing the Shape of the Mouse Pointer, Mouse Events, Mouse Buttons, Shift, Ctrl and Alt Keys, Drag-and-Drop, Key Events, KeyPreview Property.

Error Handling and Debugging: Introduction, When Error Handling Should be Used, A Simple Error-Handling Example: Divide by Zero, Nested on Error Statements, Err Object, Resume Statement.

Text Book:

1. Deitel & Deitel & T.R. Nieto-Visual Basic 6 How to Program, Pearson Education, New Delhi-2005.

Refernce Book:

1. Content Development Group, Visual Basic 6, Tata McGraw Hill, New Delhi.

BCA 3008 BASIC ELECTRONICS

Introduction: The Three Kinds of Formulas, Approximations, Voltage Sources, Current Sources, Thevenin's Theorem, Norton's Theorem, Troubleshooting.

Semiconductors: Conductors, Semiconductors, Silicon Crystals, Intrinsic Semiconductors, Two Types of Flow, Doping a Semiconductor, Two Types of Extrinsic Semiconductors, The Unbiased Diode, Forward Bias, Reverse Bias.

Diode Theory: Basic Ideals, The Ideal Diode, The Second Approximation, The Third Approximation.

Diode Circuits: The Half-Wave Rectifier, The Transformer, The Full-Wave Rectifier, The Bridge Rectifier.

Bipolar Transistors: The Unbiased Transistor, The Biased Transistor, Transistor Currents, The CE Connection.

Transistor Fundamentals: Variations in Current Gain, The Load Line, The Operating Point, Recognizing Saturation, The Transistor Switch, Emitter Bias.

AC Models: Base-Biased Amplifier, Emitter-Biased Amplifier, Small-Signal Operation.

Voltage Amplifiers: Voltage Gain, The Loading Effect of Input Impedance.

MOSFETs: The Depletion-Mode MOSFET, The Enhancement-Mode MOSFET, Multistage Amplifiers, The Ohmic Region, Digital Switching, CMOS, Power FETs.

Text Book:

1. Albert Paul Malvino- Malvino Electron Principles, TMH, Sixth Edition-1999

Reference book:

1. B.P .Singh & R.Singh- Electronic Devices and Integrated Circuits, Pearson Education2006.

BCA 3009 LINEAR ALGEBRA

Linear Equations and Matrices: Linear Systems, Matrices, Dot Product and Matrix Multiplication, Properties of Matrix Operations, Solutions of Linear Systems of Equations, The Inverse of a Matrix, LU-Factorization.

Determinants: Definition and Properties, Cofactor Expansion and Applications, Determinants from a Computational Point of View.

Vector in R^n : Vector in the Plane, n-Vectors, Introduction to Linear Transformations.

Real Vector Spaces: Vector Spaces, Subspaces, Linear Independence, Basis and Dimension, Homogeneous Systems, The Rank of a Matrix and Applications, Coordinates and Change of Basis, Orthonormal Bases in R^n , Orthogonal Complements.

Eigenvalues, Eigenvectors, and Diagonalization: Eigenvalues and Eigenvectors, Diagonalization, Diagonalization of Symmetric Matrices.

Linear Transformations and Matrices: Definition and Examples, The Kernel and Range of a Linear Transformation, The Matrix of a Linear Transformation.

Text Book:

1. R.Kolman & D.R.Hill- Linear Algebra With Applications, Pearson Education, Seventh Edition- 2003.

Reference Book:

1. S.Singh-Linear Algebra, Vikas Publication, New Delhi-2000.