ODD SEMMISTER

BCA UPDATED SYLLABUS(2019-20)

COURSE CONTENT

SEMESTER I

COURSE CODE	COURSE NAME
BCA-101	Mathematics –I (MATHS)
BCA-102	Programming Principle & Algorithm (PPA)
BCA-103	Computer Fundamental & Office Automation (CFOA)
BCA-104	Principle of Management (POM)
BCA-105	Business Communication (BC)
BCA-106P	Computer Laboratory and Practical Work of Office Automation
BCA-107P	Computer Laboratory & Practical Work of C Programming
QUALIFYING PAPER	
008	Environmental Studies (EVS)

SEMESTER III

COURSE CODE	COURSE NAME
BCA-301	Object Oriented Programming Using C++ (C++)
BCA-302	Data Structure Using C & C++ (DSC)
BCA-303	Computer Architecture & Assembly Language (CAAL)
BCA-304	Business Economics (BE)
BCA-305	Elements of Statistics (EL)
BCA-306P	Computer Laboratory and Practical Work of OOPS
BCA-307P	Computer Laboratory and Practical Work of DS

SEMESTER V

COURSE CODE	COURSE NAME
BCA-501	Introduction to DBMS
BCA-502	Java Programming and Dynamic Webpage Design
BCA-503	Computer Network
BCA-504	Numerical Methods
BCA-505P	Minor Project
BCA-506P	Viva-Voice on Summer Training
BCA-507P	Computer Laboratory and Practical Work of DBMS
BCA-508P	Computer Laboratory and Practical Work of Java Programming & Dynamic Webpage Design

COURSE CONTENT FOR SEMESTER – I

BCA-101 MATHEMATICS -I

Unit – I	DETERMINANTS	Definition, Minors, Cofactors, Properties of Determinants MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof)
Unit – II	LIMITS & CONTINUITY:	Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities
Unit– II	DIFFERENTIATION:	Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Curve Tracing, Successive Differentiation & Liebnitz Theorem.
Unit– IV	INTEGRATION:	Integral as Limit of Sum, Fundamental Theorem of Calculus (without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions(definition).
Unit – V	VECTOR ALGEBRA:	Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and physical interpretation of area and volume.

Referential Books:

1. .S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
2. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
4. Shanti Narayan, "Differential Caluculs", S.Chand & Company, 1998.

BCA-102 PROGRAMMING PRINCIPLE & ALGORITHM

Unit – I	Introduction to 'C' Language	History, Structures of 'C' Programming, Function as building blocks.
	Language Fundamentals	Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, Comments.
Unit – II	Operators	Types of operators, Precedence and Associativity, Expression, Statement and types of statements
	Build in Operators and function	Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.
Unit– III	Control structures	Decision making structures: If, If-else, Nested If-else, Switch; Loop Control structures: While, Dowhile, for, Nested for loop; Other statements: break, continue, goto, exit.
Unit– IV	Introduction to problem solving	Concept: problem solving, Problem solving techniques (Trail & Error, Brain Stroming, Divide & Conquer) Steps in problem solving (Define Problem, Analyze Problem, Explore Solution) Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditionals in pseudo-code, Loops in pseudo code Time complexity: Big-Oh notation, efficiency Simple Examples: Algorithms and flowcharts (Real Life Examples)
Unit – V	Simple Arithmetic Problems	Addition / Multiplication of integers, Determining if a number is +ve / -ve / even / odd, Maximum of 2 numbers, 3 numbers, Sum of first n numbers, given n numbers, Integer division, Digit reversing, Table generation for n, a^b, Factorial, sine series, cosine series, ${}^nC_r$, Pascal Triangle, Prime number, Factors of a number, Other problems such as Perfect number, GCD numbers etc (Write algorithms and draw flowchart), Swapping
Unit-VI	Functions	Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.

Referential Books:

1. Let us C-Yashwant Kanetkar.
2. Programming in C-Balguruswamy
3. The C programming Lang., Pearson Ecl - Dennis Ritchie
4. Structured programming approach using C- Forouzah & Ceilber Thomson learning publication.
5. Pointers in C - Yashwant Kanetkar
6. How to solve it by Computer - R.G. Dromy
7. Peter Norton's Introduction to Computers - Tata MGHill

BCA-103 COMPUTER FUNDAMENTAL & OFFICE AUTOMATION

Unit – I	Introduction to Computers	Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. \Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication
Unit – II	Algorithm and Flowcharts	Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples
Unit– III	Operating System and Services in O.S.	Dos - History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.
Unit– IV	Windows Operating Environment	Features of MS - Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.
Unit – V	Editors and Word Processors	Basic Concepts, Examples: MS-Word, Introduction to desktop publishing.
Unit – VI	Spreadsheets and Database packages	Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.

Referential Books:

1. Fundamental of Computers - By V.Rajaraman B.P.B. Publications
2. Fundamental of Computers - By P.K. Sinha
3. Computer Today- By Suresh Basandra
4. Unix Concepts and Application - By Sumitabha Das
5. MS-Office 2000(For Windows) - By Steve Sagman
6. Computer Networks - By Tennenbum Tata MacGrow Hill Publication

BCA-104 PRINCIPLE OF MANAGEMENT

Unit – I	Nature of Management:	Meaning, Defination, it's nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization, Management Skills, Levels of Management.
Unit – II	Evolution of Management Thought:	Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Business Ethics & Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.
Unit– III	Functions of Management: Part-I	Planning - Meaning- Need & Importance, types, Process of Planning, Barriers to Effective Planning, levels - advantages & limitations. Forecasting- Need & Techniques Decision making-Types - Process of rational decision making & techniques of decision making Organizing - Elements of organizing & processes: Types of organizations, Delegation of authority - Need, difficulties Delegation - Decentralization Staffing - Meaning & Importance Direction - Nature - Principles Communication - Types & Importance
Unit– IV	Functions of Management: Part-II	Motivation - Importance - theories Leadership - Meaning -styles, qualities & function of leader Controlling - Need, Nature, importance, Process & Techniques, Total Quality Management Coordination - Need - Importance
Unit – V		Management of Change: Models for Change, Force for Change, Need for Change, Alternative Change Techniques, New Trends in Organization Change, Stress Management.
Unit – VI	: Strategic Management	Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India

Referential Books :

1. Essential of Management - Horold Koontz and Iteinz Weibrich- McGrawhills International
2. Management Theory & Practice - J.N.Chandan
3. Essential of Business Administration - K.Aswathapa, Himalaya Publishing House
4. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons -New Delhi
5. Business Organization & Management - Dr. Y.K.Bhushan
6. Management: Concept and Strategies By J.S. Chandan, Vikas Publishing
7. Principles of Management, By Tripathi, Reddy Tata McGraw Hill
8. Business organization and Management by Talloo by Tata McGraw Hill
9. Business Environment and Policy - A book on Strategic Management/ Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001 Edition

BCA-105 BUSINESS COMMUNICATION

Unit – I	Means of Communication:	Meaning and Definition - Process - Functions - Objectives - Importance - Essentials of good communication - Communication barriers, 7C's of Communication
Unit – II	Types of Communication: Oral Communication:	Meaning, nature and scope - Principle of effective oral communication - Techniques of effective speech - Media of oral communication (Face-to-face conversation - Teleconferences - Press Conference - Demonstration - Radio Recording - Dictaphone - Meetings - Rumour - Demonstration and Dramatisation - Public address system - Grapevine - Group Discussion - Oral report - Closed circuit TV). The art of listening - Principles of goodlistening.
Unit– III	Written Communication	Purpose of writing, Clarity in Writing, Principle of Effective writing, Writing Techniques, Electronic Writing Process
Unit– IV	Business Letters & Reports:	Need and functions of business letters - Planning & layout of business letter - Kinds of business letters - Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.
Unit – V	Drafting of business letters:	Enquiries and replies - Placing and fulfilling orders - Complaints and follow-up Sales letters - Circular letters Application for employment and resume
Unit – VI	Information Technology for Communication: Topics Prescribed for workshop/skill lab	Word Processor- Telex - Facsimile(Fax) - E-mail- Voice mail – Internet - Multimedia - Teleconferencing - Mobile Phone Conversation - Video Conferencing -SMS - Telephone Answering Machine - Advantages and limitations of these types. Group Discussion, Mock Interview, Decision Making in a Group

Referential Books :

1) Business Communication - K.K.Sinha - Galgotia Publishing Company, New Delhi.
2) Media and Communication Management - C.S. Rayudu - Hikalaya Publishing House, Bombay.
3) Essentials of Business Communication - Rajendra Pal and J.S. Korlhalli- Sultan Chand & Sons, New Delhi.
4) Business Communication (Principles, Methods and Techniques) Nirmal Singh – Deep & Deep Publications Pvt. Ltd., New Delhi.
5) Business Communication - Dr.S.V.Kadvekar, Prin.Dr.C.N.Rawal and Prof.Ravindra Kothavade- Diamond Publications, Pune.
6) Business Correspondence and Report Writing - R.C. Sharma, Krishna Mohan – Tata McGraw-Hill Publishing Company Limited, New Delhi.
7) Communicate to Win - Richard Denny - Kogan Page India Privat Limited, New Delhi.
8) Modern Business Correspondence - L.Gartside - The English Language Book Society and Macdonald and Evans Ltd.
9) Business Communication - M.Balasubrahmanyan -Vani Education Books. 10) Creating a Successful CV -Siman Howard – Dorling Kidersley.

106P Computer Laboratory And Practical Work Of Office Automation

Practical will be based on Paper Office Automation: Covers UNIT-III, UNIT-IV, UNIT-V, UNIT-VI of Syllabus

107P Computer Laboratory and Practical Work of Programming Principle & Algorithm

Practical will be based on Paper Programming Principle & Algorithm: Covers UNIT-III, UNIT-IV, UNIT-V, UNIT-VI of Syllabus

QUALIFYING PAPER

ENVIRONMENTAL STUDIES (CODE-008)

UNIT-1: THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, Scope and Importance, Need for Public Awareness.

UNIT-2: NATURAL RESOURCES

- Renewable and Non-renewable Resources:

Natural resources and associated problems: -

a) FOREST RESOURCES: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

b) WATER RESOURCES: use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) MINERAL RESOURCES: use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) FOOD RESOURCES: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) ENERGY RESOURCES: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies

f) LAND RESOURCES: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles

UNIT-3: ECOSYSTEMS

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession

- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: -
    a) Forest ecosystem
    b) Grassland ecosystem
    c) Desert ecosystem
    d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-4: BIODIVERSITY AND ITS CONSERVATION

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity: Consumptive use, productive use, social, ethical, and aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-sports of biodiversity.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-5: ENVIRONMENTAL POLLUTION

DEFINITION:

- Causes, effects and control measures of: -
    a) Air pollution
    b) Water pollution
    c) Soil pollution
    d) Marine pollution
    e) Noise pollution
    f) Thermal pollution
    g) Nuclear pollution

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster Management: Floods, earthquake, cyclone and landslides.

UNIT-6: SOCIAL ISSUES AND THE ENVIRONMENT

- From Unsustainable to Sustainable development
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies

- Environmental Ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Wasteland reclamation.
- Consumerism and waste products
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

UNIT-7: HUMAN POPULATION AND THE ENVIRONMENT

- Population growth, variation among nations.
- Population explosion: Family Welfare Programme.
- Environment and human health
- Human Rights
- Value Education
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

UNIT-8: FIELD WORK

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours).

COURSE CONTENT FOR SEMESTER – III

BCA-301 Object Oriented Programming Using C++

Unit – I	Introduction	Introducing Object- Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.
	Basic terms and ideas	Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.
Unit – II	Classes and Objects	Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass / abstract classes.
Unit– III	Inheritance and Polymorphism	Inheritance, Class hierarchy, derivation - public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism
Unit– IV	Generic function	Template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.
Unit – V	Files and exception Handling	Streams and files, Namespaces, Exception handling, Generic Classes

Referential Books:

1. A.R.Venugopal, Rajkumar, T. Ravishanker “Mastering C++”, TMH, 1997.
2. S.B.Lippman & J.Lajoie, “ C++ Primer”, 3rd Edition, Addison Wesley, 2000.The C programming Lang., Person Ecl - Dennis Ritchie
3. R.Lafore, “Object Oriented Programming using C++”, Galgotia Publications, 2004
4. D.Parasons, “Object Oriented Programming using C++”, BPB Publication.

BCA-302 Data Structure Using C & C++

Unit – I	Introduction to Data Structure and its Characteristics Array	Representation of single and multidimensional arrays; Sprase arrays - lower and upper triangular matrices and Tridiagonal matrices with Vector Representation also.
Unit – II	Stacks and Queues	Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.
Unit– III	Lists	Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, Two way lists and Use of headers
Unit– IV	Trees	Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree
Unit – V	B-Trees	Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree
Unit - VI		Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

Referential Books:

1. E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd.2003
2. R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co.(P) Ltd..,2002
3. Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

BCA-303 Computer Architecture & Assembly Language

Unit – I		Basic computer organization and design, Instructions and instruction codes, Timing and control/ instruction cycle, Register/ Types of register/ general purpose & special purpose registers/ index registers, Register transfer and micro operations/ register transfer instructions, Memory and memory function, Bus/ Data transfer instructions, Arithmetic logic micro-operations/ shift micro-operations, Input/ Output and interrupts, Memory reference instructions, Memory interfacing memory/ Cache memory.
Unit – II	Central Processing Unit	General Register Organization/ stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing. Arithmetic Algorithms: Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating-point representations.
Unit– III	Computer Arithmetic	Addition, subtraction and multiplication algorithms, divisor algorithms. Floating point, arithmetic operations, decimal arithmetic operations, decimal arithmetic operations.
Unit– IV	Input - Output Organization	Peripheral devices, Input/output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication.
Unit – V	Evaluation of Microprocessor	Overview of Intel 8085 to Intel Pentium processors Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface.
Unit – VI		Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming.

Referential Books:

1. Leventhal, L.A, "Introduction to Microprocessors", Prentice Hall of India
2. Mathur, A.P., "Introduction to Microprocessors" , Tata McGraw Hill
3. Rao,P.V.S., "Prospective in Computer Architechture" , Prentice Hall of India

BCA-304 Business Economics

Unit – I	The Scope and Method of Economics, the Economic Problem	Scarity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The Concept of Elasticity and it's Applications.
	The Production Process	Output decisions - Revenues Costs and Profit Maximisation
	Laws of returns & Returns to Scale	Economics and Diseconomies of scale.
Unit – II	Market Structure	Equilibrium of a firm and Price, Output Determination under Perfect Competition Monopoly, Monoplastic Competition & Oligopoly
Unit– III	Macro Economic Concerns	Inflalation, Unemployment, Trade-Cycles, Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring national Income and Output
Unit– IV	The World Economy	- WTO, Globalisation, MNC's, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of dumping, Export-Import Policy 2004-2009

Referential Books:

1. Ahuja H.L., "Business Economics",S.Chand & Co., New Delhi, 2001
2. Ferfuson P.R., Rothchild, R and Fergusen G.J."Business Economics" Mac-millan, Hampshire, 1993
3. Karl E.Case & Ray C. fair , "Principles of Economics" , Pearson Education , Asia, 2000
4. Nellis, Joseph, Parker David, " The Essence of Business Economics",Prentice Hall, New Delhi, 1992.

BCA-305 Elements of Statistics

Unit – I	Population, Sample and Data Condensation	Definition and scope of statistics, concept of population and simple with Illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution.
Unit – II	Measures of Central Tendency	Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.
Unit– III	Measures of Dispersion	Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation, Coefficient of variation
Unit– IV	Permutations and Combinations	Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetitions). ${}^{n}P_{r}$ = n!/(n-r) !(without proof). Combinations of 'r' objects taken from 'n' objects. ${}^{n}C_{r}$ = n!/(r!(n-r)!) (without proof) . Simple examples, Applications.
Unit – V	Sample space, Events and Probability	Experiments and random experiments, Ideas of deterministic and non-deterministic experiments; Definition of sample space, discrete sample space, events; Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. Classical definition of probability, Addition theorem of probability without Proof (upto three events are expected). Definition of conditional probability Definition of independence of two events, simple numerical problems.
Unit – VI	Statistical Quality Control	Introduction, control limits, specification limits, tolerance limits, process and product control; Control charts for X and R; Control charts for number of defective {n-p chart} ,control charts for number of defects {c - chart}

Referential Books:

1. S.C.Gupta - Fundamentals of statistics - Sultan chand & sons , Delhi.
2. D.N.Elhance - Fundamentals of statistics - Kitab Mahal, Allahabad.
3. Montogomery D.C. - Statistical Quality Control - John Welly and Sons
4. Goon, Gupta And Dasgupta- Fundamentals of statistics- The world press private ltd. , Kolkata.
5. Hogg R.V. and Craig R.G. - Introduction to mathematical statistics Ed 4 {1989} - Macmillan Pub. Co. Newyork.
6. Gupta S.P. - Statistical Methods , Pub - Sultan Chand and sons New Delhi

Course Code Course Name

BCA-306P Computer Laboratory and Practical Work of OOPS

Practical will be based on Paper Object Oriented Programming: Covers UNIT-II, UNIT-III, UNIT-IV, UNIT-V of Syllabus

BCA-307P Computer Laboratory and Practical Work of DS

Practical will be based on Paper Data Structure: Covers UNIT-III, UNIT-IV, UNIT-V, UNITVI of Syllabus

COURSE CONTENT FOR SEMESTER – V

BCA-501 Introduction to DBMS

Unit – I **Introduction:** Characteristics of database approach, data models, DBMS architecture and data independence.

Unit – II **E-R Modeling:** Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

Unit– III **File Organization:** Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

Unit– IV **Relational Data Model:** Relational model concepts, relational constraints, relational alzebra SQL: SQL queries, programming using SQL.

Unit – V **EER and ER to relational mapping:** Data base design using EER to relational language.

Unit – VI **Data Normalization:** Functional Dependencies, Normal form up to 3rd normal form.
Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Referential Books:

1. Abraham Silberschatz, Henry Korth, S.Sudarshan,"Database Systems Concepts", 4th Edition, McGraw Hill, 1997.
2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan
3. A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
4. Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

BCA-502 Java Programming and Dynamic Webpage Design

Unit – I **Java Programming:** Data types, control structured, arrays, strings, and vector, classes (inheritance, package, exception handling) multithreaded programming.

Unit – II
Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions)

Unit– III Networking (datagram socket and TCP/IP based server socket) event handling,
JDBC: Introduction, Drivers, Establishing Connection, Connection Pooling.

Unit– IV **HTML:** use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file formats including image formats.

Unit – V **Java Servlets:** Introduction, HTTP Servlet Basics, The Servlet Lifecycle, Retrieving Information, Sending HTML Information, Session Tracking, Database Connectivity

Unit- VI **Java Server Pages:** Introducing Java Server Pages, JSP Overview, Setting Up the JSP Environment, Generating Dynamic Content, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output.

Referential Books:

1. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference" 199, TMH.
2. Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998.
3. Ivor Horton, "Beginning Java-2" SPD Publication
4. Jason Hunter, "Java Servlet Programming" O'Reilly
5. Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998
6. Hans Bergsten, "Java Server Pages", 3 rd Ed. O'reilly

BCA-503 Computer Network

Unit – I **Basic Concepts:** Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks.
OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, Modems, Cable modems.

Unit – II **Transmission Media:** Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media

Unit– III **Telephony:** Multiplexing, error detection and correction: Many to one, One to many, WDM, TDM, FDM, Circuit switching, packet switching and message switching.
Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.
Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP.
ISDN: Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN.

Unit– IV **Devices:** Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

Unit – V **Transport and upper layers in OSI Model:** Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

Referential Books:

1. A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed. 2003.
2. Behrouz A.Forouzan, "Data Communication and Networking", 3rd Ed. Tata MCGraw Hill, 2004.
3. William stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

BCA-504 Numerical Methods

Unit – I **Roots of Equations:** Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

Unit – II **Interpolation and Extrapolation :** Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, LaplaceEverett formula.

Unit– III **Numerical Differentiation Numerical Integration**: Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three-eight rule.

Unit– IV **Solution of Linear Equation:** Gauss's Elimination method and Gauss's Siedel iterative method.

UNIT-V **Solution of Differential Equations:** Euler's method, Picard's method, Fourth-order Ranga - Kutta method.

Referential Books:

1. Scarbourogh, "Numerical Analysis".
2. Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata,
3. S.S.Shashtri, " Numerical Analysis", PHI

BCA-505P Minor Project

Evaluation will be based on Summer Training held after fourth semester and will be Conducted by the college committee only.

BCA-506P Viva-Voice on Summer Training

The viva will be conducted based on summer training of four weeks after the end of fourth Semester and will be Conducted by the college committee only.

BCA-507P Computer Laboratory and Practical Work of DBMS

Practical will be based on Paper Data Base Management System : on UINT-IV converging the concept from UNIT-II to UNIT-VI of Syllabus

BCA-508P Computer Laboratory and Practical Work of Java Programming and Dynamic Webpage Design

Practical will be based on Paper Data Base Management System : on UINT-IV converging the concept from UNIT-II to UNIT-VI of Syllabus